

A CLUSTER DEVELOPMENT APPROACH TO ENHANCE SMALLHOLDER FARMERS'
MARKET ACCESS AND ECONOMIES OF SCALE IN SOUTH AFRICA: PERSPECTIVES
OF AGRICULTURAL SECTOR IMPLEMENTATION EXPERIENCES.

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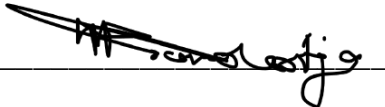
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DECLARATION

I, Modlu Peter Ramolotja, declare that the mini-dissertation I submit for the degree of Masters of Development Studies at the University of the Free State is my original work and has not been submitted to any University to obtain a qualification.

Signature: 

Date: 11/02/2025

DEDICATION

The research paper is dedicated to my cousin, Tshidi Gladys Mahomolela, who planted the seed for academic excellence by ensuring I obtained my junior degree. The sacrifices you made have not gone unnoticed. May the good Lord bless you abundantly.

The study is also dedicated to my late grandmother, Ledile Lucy Modiba, who instilled a sense of discipline from a young age. Her teachings and no-nonsense attitude contributed to the man I am today. May your soul rest in eternal peace.

The paper is also dedicated to everybody who contributed to my life positively, from my colleagues in the Department of Agriculture in the Free State, the Department of Correctional Services in Virginia and the Department of Agriculture, Land Reform and Rural Development. Your influence contributed to the paper.

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Over and above, I would like to acknowledge the guidance and presence of God Almighty throughout my study period. His blessings gave me the strength to undertake this study.

Again, my wife deserves a special mention for her encouragement to further my studies. After years of academic wilderness, she encouraged me to pursue a master's degree. Her attainment of a second master's degree further fueled the fire in me to continue with my studies to the end. She played her role very well by caring for the household and keeping the house warm to ensure that I focused on my studies. She supported me during the lonely journey of the study and made sure that I was shielded from everything that would shift my focus from the study. She also endured a lonely period during the period of the study. To her, I say thank you for being a pillar of strength.

I would also like to thank my family for their understanding and patience throughout my study period. My parents, Frans and Julia Ramolotja, have been very supportive during the period of the study; and to them, I would like to say "thank you". You have been advocating education throughout the years. I want to acknowledge further the immeasurable support I received from my siblings. Having brothers and sisters like you is a blessing. To my beloved children, I would like to thank you for your patience and understanding. You have endured a period in which you hardly spent time with your father. I promise to compensate you for the lost time.

The study would not have been possible without the support I received from my employer. The Department of Agriculture, Land Reform and Rural Development afforded me the financial support to undertake the study. The return on investment will be realised by contributing to the development of smallholder producers in the country.

ABSTRACT

The study aims to investigate the use of a cluster development approach in helping smallholder farmers achieve economies of scale and participate in the market sustainably. It focused on the potato producers who are producing for the market and belong to a cluster, specifically the 12 smallholder farmers belonging to the Blouberg potato cluster.

The research employed the qualitative research approach because it is inclined to seek understanding and meaning of a phenomenon and to capture people's lived experiences. It was chosen because it allows the researcher to gather in-depth information by allowing people to describe a phenomenon according to their understanding and perspectives. With its naturalistic nature, the approach generates rich data, allowing the researcher to understand the phenomenon comprehensively.

The study found that a successful cluster consists of companies that have strong relationships to enable the flow of information and skills. In the cluster, farmers became friends before farming, resulting in high levels of trust. Institutions involved in supporting farmers include the Land Bank, PotatoSA, MAFISA, Kgodiso Financial Services and the Government. Additionally, the cluster is located in an area endowed with natural resources that support the planting of potatoes throughout the year. The success of the cluster is also based on the entrepreneurial spirit of the individual farmers. Many of the farmers started small, using meagre resources to grow their businesses. They attained economies of scale by reducing transaction costs through collective marketing, sharing inputs, machinery and transportation.

The study recommends the creation of a conducive environment for creating strong relations among the farmers. It also recommends the involvement of further training institutions in the training of the farmers; the promotion of vocational and business incubation; farmers belonging to commodity organizations; coordinated procurement of inputs and marketing; selection of location that provides a competitive edge and the

support from the government in the form of extension services, infrastructure and production inputs

Keywords:

Smallholder farmers, cluster development approach, market participation, potato producers, economies of scale

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LIST OF ABBREVIATIONS

ARC:	Agricultural Research Council.
CDA:	Cluster Development Approach.
CSIS:	Center for Strategic and International Studies.
DALRRD:	Department of Agriculture, Land Reform and Rural Development.
FAO:	Food and Agricultural Organisation of the United Nations.
FI:	Financial Institutions.
GDP:	Gross Domestic Product.
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit.
IFAD:	International Fund for Agricultural Development
IFC:	International Finance Corporation.
Land Bank:	Land and Agricultural Development Bank of South Africa.
LDS:	Land Development Support.
MAFISA:	Micro Agricultural Finance Scheme of South Africa.
NARES:	National Research and Extension Services
NIVO:	Nietvorbij Institute for Verticulture and Oneology.
NSNP:	National School Nutrition Programme.
OECD:	Organisation for Economic Cooperation and Development.
PARM:	Platform for Agricultural Risk Management.
PEPSICO:	PepsiCo South Africa.
PLAS:	Proactive Land Acquisition Strategy.
PTO:	Permission to Occupy.
SAADA:	Strategic Alliance for Agricultural Development in Africa.
SEZ:	Special Economic Zone.
SME:	Small and Medium Enterprise.
UNIDO:	United Nations Industrial Development Organization.
USDA:	United States Department of Agriculture.
USAID:	United States Agency for International Development.
WEF:	World Economic Forum.

WFP: World Food Programme.

WINET: Wine Industry Network for Expertise and Technology.

LIST OF TABLES

Table 5.1. Presentation of the main findings and recommendations

CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

The cluster development approach is acknowledged as an effective strategy for improving market access for smallholder farmers and increasing economies of scale in agriculture (SEARCA, 2022; Montiflor et al. 2008). Clusters improve collaboration among farmers, agribusinesses, and other stakeholders near them, promoting innovation and improving efficiency through shared resources and collective action. This method has demonstrated the ability to enhance value chains, lower transaction costs, and increase competitiveness in local and global markets. Smallholder farmers in South Africa face various challenges, such as restricted market access, high input costs, and fragmented production. Adopting a cluster model presents a viable strategy for addressing these obstacles and attaining sustainable growth (Trushkina et al., 2021, Adam et al., 2024).

Small-holder farming in South Africa is essential for rural livelihoods and food security; however, it faces significant structural and socioeconomic challenges. Farmers frequently face challenges related to inadequate infrastructure, restricted access to market information, and diminished bargaining power, resulting in low profitability and limited opportunities for growth (Mfundo & Masuku, 2021). Organizing farmers into clusters can effectively address inefficiencies, allowing collective marketing of produce, improved price negotiations, and improved access to technical and financial resources (Trushkina et al., 2021). Cluster development facilitates the integration of smallholder farmers into formal markets, essential for their long-term viability and competitiveness (Magakwe & Olorunfemi, 2024).

The success of agricultural clusters in developed regions demonstrates their potential as a model to improve small-holder agriculture systems in developing countries. Farmers in these clusters gain advantages from collective infrastructure, access to advanced technologies, and economies of scale. The benefits improve the efficiency of production and improve the quality of agricultural products to meet market standards. Insights from

these contexts highlight the necessity of aligning cluster development initiatives with local socioeconomic conditions to guarantee their sustainability and effectiveness in various agricultural settings (Adam et al., 2024).

The potential of cluster-based strategies to facilitate agricultural transformation in South Africa is significant, yet largely unexamined (Toolo, 2015). The government's support initiatives, including financial subsidies and infrastructure development, have made progress in addressing the challenges faced by smallholders. The lack of comprehensive policies designed for cluster formation and management has impeded broad implementation. Emphasizing clusters can enhance current initiatives, promoting resilience and establishing sustainable market connections for smallholder farmers, thereby supporting national food security and rural development (Magakwe & Olorunfemi, 2024).

1.2. Background of the study

Developing countries have identified cluster development as a tool for broad-based local economic development as it promotes growth and innovation in the private sector (UNIDO, 2010). The Cluster Development Approach (CDA) is a method of clustering companies of characteristics in a geographical area. The CDA aims to create equal opportunities and benefits for sectors of society through economic growth. Its main concern is to stimulate growth that supports broad-based economic development and the removal of constraints (United Nations Industrial Development Organization (UNIDO), 2020; 2013). The use of CDA is most suitable when companies share similar cultural and social backgrounds (UNIDO, 2020).

The clustering of companies within a geographical area allows them to benefit from low input costs due to economies of scale, sharing of skills and knowledge, and increased collaboration and productivity. A group of companies can access value chains that would otherwise be inaccessible to individual companies. These value chains are essential for

driving local economic development and resilience in local economies (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 2021).

Several countries have identified clustering as a tool for economic development. The clustering of companies within a geographic area encourages the development of entrepreneurship. Through entrepreneurship, new job opportunities are created, gross domestic product (GDP) is improved, and poverty is alleviated (Abdin and Rahman, 2015).

Clusters are found in various parts of the world, with Europe leading with 3500 clusters responsible for creating sustainable economic development and regional resilience. Other regions that have adopted clustering as an approach to economic development include North Africa, Asia, and Sub-Saharan countries (GIZ, 2021). In China, there are 30 000 firms in 60 cluster zones, employing 3.5 million people and generating £200 US dollars per year (Mazur et al., 2016). Clusters collaborate to win and retain customers, benefiting individual companies, sectors, and the broader economy (Porter, 1998).

1.3 Definition of concepts

The following concepts were deemed the key concepts in this study:

- 1.3.1 Cluster Development** Cluster development refers to the organisation of small farmers into geographically proximate groups or networks to collectively improve their productivity, market access, and competitiveness. This approach allows farmers to share resources, reduce transaction costs and benefit from economies of scale, leading to improved market integration and profitability (Ma et al., 2024).
- 1.3.2 Smallholder farmers** are individuals or households engaged in agricultural production on a small scale, often characterised by limited land, resources, and access to markets. These farmers often face barriers such as lack of finance, technology, and infrastructure, which cluster approaches aim to address (Balakrishnan et al., 2024).

- 1.3.3** Market access refers to the ability of farmers to reach and engage with local, regional, or global markets for their agricultural produce. It involves overcoming logistical, informational, and economic barriers to ensure consistent and profitable sales channels. Cluster farming improves market access by facilitating collective bargaining and integration into value chains (Dureti et al., 2023).
- 1.3.4** Economies of scale describe cost advantages gained when production increases, resulting in lower average costs per unit. In the context of cluster development, smallholder farmers achieve economies of scale by pooling resources, purchasing input in bulk, and sharing infrastructure such as storage and transportation (Balakrishnan et al., 2024).
- 1.3.5** Value chain integration refers to the alignment and coordination of production, processing, and distribution processes to add value and increase efficiency. Cluster approaches promote integration by linking farmers to processors, distributors, and retailers, allowing them to capture greater value from their produce (Dureti et al., 2023).

1.4 Problem statement

Small farmers in South Africa play a vital role in food security and economic development; however, they face considerable challenges that restrict their potential. The sector plays a significant role in rural employment and livelihood sustainability; however, the high failure rate of small businesses, estimated at 70-80%, presents a critical issue (du Plessis & Marnewick, 2017). This is frequently attributed to factors including environmental pressures, insufficient marketing strategies, financial instability, and ineffective management systems (Van Eeden, Viviers & Venter, 2003). Smallholder farmers face exacerbated challenges due to fragmented operations and restricted access to affordable production inputs, hindering their ability to achieve economies of scale or engage in traditional markets (UNIDO, 2001). Research indicates that clustering small businesses, such as farmers, can promote job creation, increase income generation, and support sustainable local development (UNIDO, 2010; Zeleke & Wordofa., 2024).

Cluster development has demonstrated effectiveness worldwide in overcoming systemic barriers encountered by small businesses. Clusters facilitate access to larger markets, reduce transaction costs, and improve competitiveness for farmers through resource pooling, infrastructure sharing, and collective bargaining power (Sitnicki et al., 2024). These models have proven effective in improving agricultural productivity and resilience to economic and climatic shocks (Sarma et al., 2024). The implementation of these best practices in South Africa is currently restricted, highlighting the need for a framework that can be adapted to local socio-economic contexts. This study examines the application of cluster development approach to address systemic challenges, enhance market potential, and promote inclusive growth for smallholder farmers. In Blouberg, Limpopo Province.

1.5 The aim of the study

The study investigates how a cluster development approach can overcome the failures associated with cooperatives and help smallholder farmers achieve economies of scale and access traditional markets. The study aims to take best practices from developed clusters and recommend them for application in the agricultural sector.

1.6 Objects of the study

- To investigate the use of the cluster development approach for smallholder development in achieving economies of scale, participation in the food value chain, and creating jobs.
- Assess the receptiveness of the cluster development approach among smallholder farmers.
- To investigate the attributes of sustainable agro-based clusters in South Africa.

1.7 Motivation of the study

The study of cluster development approaches aimed at improving smallholder farmers' market access and economies of scale in South Africa is motivated by the ongoing

challenges encountered by these farmers. Limited access to formal markets, resulting from insufficient knowledge, capacity and resources, impedes smallholders' potential to enhance household income and food security (Ndlovu & Masuku, 2021). Historical marginalization has led to the emergence of a dual farming system characterized by a robust commercial sector and an underdeveloped smallholder sector (Thamaga-Chitja & Morojele, 2014). Institutional barriers, such as socioeconomic conditions and policy frameworks, hinder smallholders' effective participation in markets (Ma et al., 2024). Government investments in agrarian reform have not significantly alleviated poverty, primarily because farmers struggle to sell their produce at profitable prices (Obi et al., 2012).

Though there is a growing body of literature on the cluster development approach, a gap exists in understanding the experiential outcomes of its effect on the enhancement of the participation of smallholder farmers in the participation of the food value chain, job creation and achieving economies of scale. The existing literature emphasizes the theoretical framework and potential benefits but lacks the real experiences of smallholder farmers in clusters. Literature indicates how cluster development approach can assist farmers in achieving the economies of scale by working together and sharing resources (Gereff, 1999), but practical outcomes of the efforts are underexplored. The literature indicates smallholder farmers operating in a cluster access markets, there is little evidence indicating the barriers to their participation in the food value chain (Barret 2008; Keiser, 2014). Additionally, the cluster development approach is associated with job creation (Swinnen & Martins, 2007), but there is a general lack of verifiable information supporting the sustainability of those jobs (Fafchamps, 2004).

Other approaches that can be used in the development of smallholder farmers include cooperatives and contract farming. While these two approaches are aimed at improving market access and increase bargaining power, they have high failure rate. Farmers do not participate in these initiatives voluntarily as these type of arrangements are initiated by government (Theba & Mbhowa, 2015). Though cluster development approach does not guarantee thriving entrepreneurship, it is more suited to small businesses because of

its agglomeration and spill over effect (Porter, 1999; UNIDO, 2014). Using cluster development approaches to address these issues may facilitate market access for smallholders, improve production, and aid in poverty reduction by increasing cash income from agricultural sales (Wardhana et al., 2021).

1.8 Limitation of the study

Investigating cluster development strategies aimed at improving market access and economies of scale for small farmers in South Africa faced various limitations that could affect the generalizability of its results. The diversity of agroecological zones, socioeconomic contexts, and institutional frameworks in South Africa presents a challenge in ensuring the uniform applicability of proposed approaches across all regions. The variability required trade-offs in selecting case study regions, which may restrict the representativeness of the findings for the broader smallholder farming sector.

A significant limitation pertains to the temporal scope of the study. The dynamic characteristics of market systems, agricultural value chains, and policy environments indicate that the findings are inherently time-bound and may not fully reflect future changes or emerging trends. The study mainly used self-reported data from small-scale farmers, which can be influenced by biases, including recall inaccuracies and social desirability effects. Despite attempts to triangulate data from various sources, such as interviews with extension officers and market intermediaries, certain discrepancies in perceptions and practices remained unresolved. The identified limitations highlight the need for continued research aimed at adapting and refining cluster development models. This is essential to address changing contexts and to maintain a positive impact on market participation and economic performance of smallholder farmers.

1.9 Outline of the study

The study adopted the following chapter outline:

Chapter 1: Introduction

This chapter introduces the study by providing context on smallholder farming challenges in South Africa, particularly limited market access and economies of scale. It outlines the research problem, sets objectives, and formulates key questions to guide the investigation. The chapter also justifies the significance of the study in promoting sustainable rural development and outlines its scope and limitations.

Chapter 2: Literature review

The review of the literature examines the theoretical foundations of cluster development, market access, and economies of scale within the small-holder farming sector. It reviews global and local perspectives on smallholder farming challenges and identifies knowledge gaps related to implementing cluster approaches. The chapter contextualizes these insights within the South African agricultural environment, emphasizing value chain integration and cost efficiencies.

Chapter 3: Research Methodology

This chapter details the methodological framework, including study design, data collection techniques, and analysis methods. Describes the rationale for selecting study areas and describes the sampling strategies used to ensure diverse perspectives. The methodology ensures that the findings are robust and reflect the socioeconomic conditions of smallholder farmers.

Chapter 4: Results and Discussion

The findings highlight the practical implementation of cluster development approaches and their impact on market access and economies of scale. The discussion critically examines the benefits observed, such as cost reductions and improved bargaining power, alongside challenges such as limited infrastructure or policy support. These insights

provide a nuanced understanding of how cluster initiatives operate within the South African context.

Chapter 5: Conclusions and Recommendations

This chapter synthesizes the key findings, emphasizing the potential of cluster development to transform small-holder farming. Provides actionable recommendations for policymakers and stakeholders to support and scale such initiatives. Future research directions are also proposed to address limitations and refine strategies to improve market access and economic outcomes.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review analyses the theoretical underpinnings of cluster development, market access, and economies of scale in the smallholder farming sector. This study examines global and local perspectives on the challenges faced by small-holder farming and identifies existing knowledge gaps with respect to the implementation of cluster approaches. This chapter situates these insights within the South African agricultural context, highlighting the importance of value chain integration and cost efficiency.

2.2 Theoretical underpinnings of cluster development

A cluster consists of interconnected firms located in close geographical proximity that offer a variety of complementary products and services while encountering similar challenges and opportunities (UNIDO, 2001). A cluster consists of a combination of companies and industries interconnected through inputs, demand, skills, and knowledge (Porter, 2003; USAID, 2008; Sonube et al., 2008). Clusters facilitate collaboration among contractors, suppliers, manufacturers, research entities, financial institutions, and technology resources to improve production efficiency (Keseleva et al., 2016).

A cluster is defined by three pillars: geography, business environment, and value creation (Ketels & Memedovic, 2008). The cluster companies are interconnected both vertically and horizontally. Horizontal networks compete within the same markets, while vertical networks operate at different levels of the same value chain and are geographically close (UNIDO, 2013; 2023; Porter, 2008). Clusters play a role in value addition. The conditions of the business environment, shaped by the actions of individual firms and the collaboration among universities, government agents, companies, and the innovation system, influence clusters (Ketels & Memedovic, 2004).

The participation of government and other institutions offers specialized guidance to cluster members. In this way, expertise and skills are disseminated, fostering an environment that supports the cluster's success (UNIDO, 2013; Porter, 2008). The

business environment is influenced by competition among cluster members, knowledge spillovers, labor markets, and suppliers (Ketels & Memedovic, 2008). Clusters are regarded effective development tools since the companies within them are established in local production regions, facilitating the concentration of resources and funding in areas with developmental potential. Cluster companies demonstrate resilience and exhibit rapid recovery and regeneration after a disaster (UNIDO, 2020). Clustering serves as an effective model for the development of small and medium enterprises (SMEs) by enabling smaller firms to achieve economies of scale and access larger markets, thus decreasing transactional and business development costs (UNIDO, 2020; 2001). Complementarity of firms improves the competitiveness of the cluster (Porter, 2008).

Clusters, despite sharing a common location, can achieve national or international status and are present in various sectors, including restaurants, industrial technology, agriculture and manufacturing. The strength of clusters is influenced by their locality, with advanced clusters typically found in urban and developed economies, while weaker clusters are located in rural areas (Porter, 1998).

In a region where various companies involved in the production of a finished product are concentrated, a competitive advantage is established and social networks are formed to enhance and disseminate knowledge (Shavina & Prokofev, 2020). Cluster companies use shared infrastructure, reduce costs associated with building infrastructure, and attract suppliers, buyers, and skilled personnel (Sonube et al., 2012). The proximity of the companies facilitates innovation and productivity, enables higher salaries, and promotes environmental stewardship (United States Agency for International Development (USAID), 2008).

2.3 Theory of cluster development

Cluster development theory has undergone substantial evolution, moving from initial agglomeration concepts that highlighted the advantages of geographical proximity for economic efficiency to more intricate ecosystem approaches that consider dynamic

economic interactions (Gamidullaeva & Strakhov, 2023). This evolution indicates a growing acknowledgment of clusters as complex systems in which innovation, collaboration, and competitive advantage arise from interconnected activities. The practical implementation of cluster development theories encounters challenges stemming from uncertainties regarding their effectiveness and the necessary policy measures for support (Wolman & Hincapié, 2015). Despite these limitations, cluster-based approaches continue to be fundamental to economic development strategies, requiring additional refinement to better align theory with practice.

The application of cluster theory has shown promise in multiple sectors, including tourism (Speldekamp et al., 2019); however, critics highlight discrepancies between its theoretical foundations and practical implementations. Viability issues have been identified in certain contexts, highlighting gaps in the functioning of clusters in real-world scenarios (Wong & Hiew, 2019). Challenges have led to an evolution toward innovative ecosystems that enhance traditional cluster models by prioritizing adaptability, collaboration, and technological integration. This transition highlights the need for systematic research aimed at refining conceptual frameworks and formulating actionable strategies to improve cluster effectiveness, especially in varied economic contexts (Gamidullaeva & Strakhov, 2023).

2.4 Clusters and Competitive Advantage

Companies within a cluster cooperate because their production is often mutually complementary and responds quickly to changes in the market. This is because they do business in a similar field or value chain (Magdalena, 2021). The external spillover effect and synergy brought about by cooperation and connections contribute to the competitiveness and economic power of the cluster (Kalicanin & Olga, 2014). Stimulation of cluster expansion by new entrants and increased productivity increases the competitiveness of the cluster. This is enhanced by the availability of resources for each cluster firm to develop new products and improve efficiency (UNIDO, 2020).

The proximity and specialization of each firm enable the creation of networks that stimulate cooperation and competitive pressure among cluster firms. Generally, the competitiveness of the group is influenced by innovation, increased productivity, and the strength and growth of the group. The reduction in transactional costs plays a role in the competitiveness of the cluster (Porter, 2008).

2.5 Clusters and Productivity

In a cluster, the reduction in production costs is due to the ease at which cluster members access production inputs, labor, and markets, increasing the productivity of the firms within the cluster. Localization enables cluster members to access specialized components, skilled employees, business services, and machinery that enables firms to improve productivity. Individual firms are pressured into improving the quality and efficiency of production due to product service coordination (Porter, 2000).

The flow of information through informal networks enables the cluster to tailor the production to the taste and preferences of the market. This results in a spillover of productivity in a cluster. The spillover of productivity is felt more in the larger clusters. In larger clusters, more knowledge of existing innovations allows for the efficient spread of ideas and knowledge, leading to improved productivity and market access (Moretti, 2021).

The costs of accessing markets, information, technical, and other specialized information are much lower in the cluster, making the cluster firms more productive and competitive. The complementarity of firms within a cluster increases productivity, making it possible to service the specific market. The presence of related firms in a cluster improves the reputation of the location and results in the ease of marketing for individual firms in a cluster. In marketing the cluster, information about the type of products produced by individual firms is shared, enhancing productivity (Porter, 2000).

2.6 Cluster and Market Access

A cluster enables small firms to overcome some weaknesses, as they depend on the strength of the cluster to develop their markets. Clusters carry out marketing activities jointly, thereby assisting small firms in overcoming their deficiencies by using collective power (Gyau et al., 2014). The cluster environment fosters cooperation and enables firms to share market information transparently. This ensures that companies within the cluster do not compete among themselves. Cluster firms contribute to the establishment of regional brands that help with enterprise development within the cluster (Tu, 2011).

The cluster can match its production to market demands, making it possible to sell at competitive prices than individual companies. Group marketing in a cluster strengthens trust and links between cluster firms, traders, and the private sector. This, in turn, promotes business development in the cluster and corrects market imperfections (Gyau et al., 2014).

2.7 Clusters and innovation

Innovation refers to a product or service that is new, improved, or available. The innovation would have been made available to the stakeholders or used by the company for production purposes (Bărbulescu et al., 2021). In a cluster, companies are exposed to new and improved machinery, evolving technology, and new service and marketing concepts. The networks and relationships within the cluster allow firms to learn from each other through direct observation and visits, creating the pressure to innovate and buy new components to improve productivity. This can also spread to local input suppliers to innovate and provide goods and services that meet the company's new requirements. The buyer trends are identified quicker in a cluster, and firms are quick to act on them than isolated firms due to capacity and flexibility (Porter, 2000). In a cluster, innovative activities generated by synergies between the cluster members result in more innovativeness in local environments (Ferrás-Hernández & Nylund, 2019).

The pressures and competition that globalization and industrialization impose on the economic environment force clusters to make innovation their survival factor (Bărbulescu et al., 2021). The proximity cluster firms enable best-practice transmission and knowledge spillovers through informal interaction. The rivalry of firms trying to outsmart each other brings rapid innovation within the cluster. This increases competition pressure and forces firms to innovate faster to regain differentiation. However, firms inside a cluster cannot stay ahead for long, but can progress much faster than isolated firms (Porter, 2000). Generally, cluster induces collective innovation more than isolated firms, resulting in cluster firms innovating intensely (Ferras-Hernandez & Nylund, 2019; Bărbulescu et al., 2021).

To maintain a competitive advantage, companies track changes in the market and respond to those changes innovatively. Furthermore; companies create a strong relationship with suppliers and customers; add new products to existing products and services to maintain a competitive advantage (IMD, 2025). The introduction of new ideas, services that lead to business improvement, growth and greater production efficiency. This leads to the lowering of production costs, improved products and customer satisfaction (Siriram et al., 2023; Distonant, 2020; Porter, 1998).

2.8 Clusters and new business formation

Regions with strong clusters experience high growth of new businesses. Business units increased economic activities and complementarity attract entrepreneurs to establish new business units. The presence of established businesses, including multinationals, opportunities for innovation, and better access to an array of inputs attract new entrepreneurs. A cluster reduces barriers and costs to establishing a business and offers skills and knowledge linked to higher rates of entrepreneurship and drivers for entrepreneurial dynamism. The level of innovation and relationships in a cluster improves operational efficiency, offering great returns on investment and encouraging expansion (Koecker, 2016; Porter, 2000).

The existence of a cluster creates opportunities for individuals to identify gaps in products and services and move towards filling them. At the cluster level, new firms can tap into skills, assets, and labor, and the availability of the financial institutions and market. Not only does the barrier to entry reduce, but the perceived risk is also reduced by the presence of other cluster firms (Porter, 2000).

2.9. Criticism of Clusters

A strong cluster needs dedicated resources with financial ability, management, and technological capability. Without these resources and the interlinking of firms, the cluster becomes weak, and firms lose their competitive advantage and start competing (Abdin and Rahman, 2015). Cluster performance becomes sluggish and their development potential remains unrealized, with companies operating on outdated and environmentally harmful technologies. With a customized environment and services, the cluster performs well. Strong clusters have the support of an environment that is responsive to their needs. The services offered by the government, research and training institutions enhance the performance of clusters (UNIDO, 2023).

The sustainability of the cluster depends on access to scientific knowledge and appropriate technology. It also depends on financial resources, infrastructure, and the ability of the cluster firms to use internal and external resources to improve the competitiveness of the cluster (Mazur et al., 2016). The tendency of clusters to invest in a particular area of development, that is, transport, decreases employment and economic growth due to the concentration and blocking effects of a successful cluster. The associate culture of the cluster firms, which is responsible for stimulating growth, results in self-sufficiency and a lock-in effect. Similarly, the successful use of technology by cluster often is not shared with new entrants, resulting in their low survival rate. The other negative aspect of successful technology utilization in a cluster is the economic slowdown of the region due to the vulnerability and specialization effect (Koshcheev, Tretiakova, and Ngoc, 2021).

In a cluster, companies regard their peers within the cluster as competition, but isolated companies regard every industry competitor as competition. In this way, isolated companies do not fall prey to blind spots (Porter, 1990). Isolated companies rely on various relationships for acquiring knowledge, creating knowledge ecosystems like those in a cluster, thereby reducing their location disadvantage (Kirkman, Simms, and Ogilvie, 2016). Kukalis (2010) observed that the difference between clustered and isolated companies in the early stage is insignificant. The difference in performance is in the later stages of development where isolated ones are better than clustered ones. In the Portuguese cork cluster, Branco & Lopes (2018) found that the economic performance of the clustered companies is better during the development stage of the cluster, but not better than the average national industry in the initial and maturity stages of the industry lifecycle. Although companies in a cluster benefit from the effects of agglomeration, the effects are not evenly distributed between firms in the cluster. Companies with average innovation capacities are the biggest benefactors, and those with the highest and lowest innovation benefit less. This is due to poorly innovative companies gaining less access to external knowledge and their capacity to process it, while strong innovative companies gain less new and useful knowledge (Hervas-Oliver et al., 2017).

2.10. Cluster development approach in the agricultural sector.

2.10.1 Cluster development trajectory

Cluster-based development has become the approach to economic transformation in many developing countries. The approach helps to gather resources from many small farms to the desired size to develop a cluster (Pakistan Planning Commission, 2020). In an agro-based cluster, stakeholders such as farmers, local entrepreneurs, and companies that support the agriculture and business development services of the region are connected (Andriushchenko et al., 2020). The approach promotes agricultural production, economic growth, rural development and competitiveness and allows small farms to serve national and international markets (Karki et al., 2021; Gregorio et al.,

2020). The challenges brought about by the global market made farmers find new ways of developing their businesses (Sharma & Anupan, 2014).

The challenges brought by globalization required big farms to innovate while exposing the weakness of smallholder farmers to service national and international markets. The effects of globalization, urbanization, markets, and changing environments drive innovation, agricultural development, patterns of consumption, and trade (World Bank, 2007). The inability of small farmers to produce on a scale and lack of bargaining power meant that they could not influence the market, resulting in low income. The introduction of the cluster approach resulted in an improvement in the competitiveness and innovation of smallholder farmers, enabling them to serve the markets (Gregorio et al., 2020).

The growth and prosperity of national economies depend on innovation, improved knowledge, technology, and science. Clusters serve as the hub for innovation and a tool for economic growth and investment. Innovation plays an important role in improved production, competitiveness and economic growth by improving job creation, alleviating poverty, and income generation (Organization for Economic Cooperation and Development (OECD), 2009). Agriculture occurs where entrepreneurs coordinate the value chains that link consumers to producers, and smallholders are increasingly involved and taking opportunities along the value chains (World Bank, 2012). Farmers in a cluster are the entrepreneurs who see their farms as businesses and are skilled in management, marketing, classification, and branding. Farmers are connected to agroprocessors through contracts and enjoy links with government agencies, industry and other related industries (Otsuka & Ali, 2020).

2.10.2 Agricultural of Cluster and value chain

The agricultural cluster is defined as the concentration of agricultural firms in each locality that specialize in agricultural production, processing, and marketing (Wardhana et al., 2017). It is a concentration of producers and institutions in a geographical proximity that are involved in creating value networks, and opportunities and solving common problems in the agricultural and food sector (Alhassan et al., 2007). The cluster connects farmers, entrepreneurs, and agricultural service providers (Gálvez-Nogales, 2010). It is a means

of grouping farmers, combining their produce and supplying in bulk. It is a strategy that seeks to incorporate smallholder producers into formal markets (Rola-Rubzen et al., 2013). It seeks to assist smallholder and forest owners with their agricultural operations in an economically viable and sustainable manner (Karki et al., 2021).

2.10.3 Competitiveness of the agricultural businesses

In a cluster, the actors in the value chain are innovative and successful when interacting with supporting institutions and actors in the supply value chain. The promotion of vertical and horizontal local agricultural enterprises in a cluster promotes innovation and the generation and use of local externalities. A well-developed agricultural cluster benefits from increased productivity through specialised inputs, access to market information, public roads, and research (Sharma & Anupam, 2014). A cluster of small firms in Indonesia made it possible for small agricultural firms enabled them to compete in the market. To reduce costs, the large firms contracted the smaller firms in the cluster to service their markets. The larger firms financed the technological upgrade and imposed quality standards, volumes, and prices on the smaller firms. Small firms and agribusinesses contracted by the larger firms became market-oriented, increased productivity, and added value to their produce (Burger et al., 2001). This led the government to support the creation of clusters because they served as a sustainable tool for linking agricultural enterprises with global value chains (Gálvez-Nogales, 2010).

The wine industry is one of the most successful clusters in Africa. To compete in the market for South African wine producers, the Cooperative Viniculture Organization (KWV) organized farmers to form a cluster. The KWV set the minimum price, established the quality standards, and controlled exports. The group was established with the aim of serving the export market. In 2003 the United Kingdom and the Netherlands were the major markets for South African wines. This led to 4340 farmers planting 108 000 acres of land under vines. The total production of the South African wine industry ended up producing 703 million liters of wine, making the country the ninth largest producer in the world. With the KWV controlling price, the South African average price remained the lowest of all the major wine exporting countries and about half of the average Australian

export price (Rabobank, 2004). Other actors that made the success of the South African wine industry possible are the Agricultural Research Council (ARC), through the Nietvorbij Institute for Viticulture and Oenology (NIVO); the Wine Industry Network for Expertise and Technology (WINET); the Elsenburg College of Agriculture and the University of Stellenbosch (Gálvez-Nogales, 2010).

Clustering is viewed as an economic tool for sustaining small and disadvantaged farmers with their farming operations, contributing to their competitiveness by combining the production, educational, infrastructure and scientific potential of the region (Sheina and Fedorovskaya, 2021; Karki et al., 2021). Clustering of agricultural firms results in a higher production level due to the division of labor, cooperation, and coordination between the cluster and buyers (Ali et al., 2015; Burger et al., 2001).

2.10.4 Potential Benefits of Agro-Based Clusters

The cluster of related agribusiness fosters improved productivity through access to information, specialized inputs, access to public goods, and innovation. Cooperative research leads to innovation and new business formations due to competition, the attraction of investors, and the demand for services. Clustering results in an improvement in farmer income due to increased productivity. It was also observed that increased employment was also a spillover effect of the result (Rola-Rubzen et al., 2013). In Brazil, the increase in fruit production increased the number of retail outlet chains, as well as the increase in investments by national and international input suppliers. Input suppliers acted as a link between farmers and multinational seed companies that marketed their improved seeds. Through research, multinational seed companies continued to produce improved varieties of seeds and held seminars to showcase their new products (Gomez, 2004). In West Africa, the Strategic Alliance for Agricultural Development for Africa (SAADA) project was implemented between 2006 and 2009. The project was implemented in the 7 countries of West Africa that included clusters of 1 million households. The researchers observed a 50% increase in agricultural productivity, a 30% increase in income and improved food security. The farmers started implementing good agricultural practices and increased the production area by 2 million hectares. As a result of the project, the

involvement of the private sector, number of stores, processing units, warehouses and employees increased by 50 percent. The business and credit providers, producer organizations, agro-entrepreneurs, National Research and Extension Services, and trade associations increased their institutional capacities (Alidou et al., 2010). The smallholder vegetable cluster farmers in Southern Philippines also experienced growth in the average monthly income. The interactions with experts, institutional buyers and government officials helped them to understand market dynamics. These interactions helped farmers to receive market information, and gain access to markets, production linkages, technical and financial support, and production inputs (Montiflor et al., 2008).

A cluster can benefit farmers, and small-and-medium businesses by attaining economies of scale and reducing transaction and related production costs. Clustering of farmers helps to share information and innovate. The agricultural cluster affects farm management, adopting new and environmental practices and technology. A cluster results in market access and increased profitability for individual farms (Sharma and Anupam, 2014). Clustering farmers helps improve their bargaining, negotiation, and entrepreneurial skills. It effectively improves yields, access to markets, and price of the produce (Rola-Rubzen et al., 2013).

2.11 Global perspectives on the challenges faced by smallholder farming and the need for a cluster approach solution.

Small-holder farming, an essential element of global food systems, faces systemic challenges that impede its productivity and resilience. Restricted access to markets, financial services, and modern technologies perpetuates cycles of poverty and low productivity among smallholder farmers. Inadequate infrastructure, including substandard transportation and storage facilities, exacerbates these issues, leading to increased post-harvest losses and decreased profitability (Tittonell et al., 2020). Despite interventions aimed at supporting small-holder farming, challenges continue to persist due to the fragmented and isolated characteristics of small-holder operations. A collaborative and structured approach, such as clustering, has been suggested to mitigate these inefficiencies and improve collective action.

The cluster approach organizes smallholder farmers into geographically proximate and functionally interconnected groups, providing a viable solution to the challenges faced by individual farmers. Clusters improve access to inputs, extension services, and markets by pooling resources, thus generating economies of scale that lower costs and improve competitiveness (Dureti et al., 2023). Clusters improve knowledge sharing and collective problem solving, essential to advance agricultural practices and address challenges such as climate change. Research in Ethiopia and India indicates that clustered smallholders achieve greater productivity and market integration than nonclustered smallholders, underscoring the transformative potential of this model for smallholder agriculture (Misra et al., 2021).21).

Cluster approaches effectively address the social and institutional barriers that frequently prevent marginalized groups, especially women and young people, from fully participating in agricultural value chains. Clusters improve inclusivity and collective bargaining, allowing these groups to access resources and decision-making platforms more equitably (Arslan et al., 2021). The success of cluster initiatives is based on supportive policies, effective governance structures, and ongoing investments in capacity building and infrastructure. Governments and development organizations should promote the formation of cooperatives, improve rural connectivity, and ensure access to credit specifically designed for cluster operations (Kouame et al., 2022).

Cluster approaches, while promising, encounter obstacles such as power imbalances among participants, mismanagement of resources, and cultural resistance to collective frameworks. Addressing these issues requires a nuanced understanding of local dynamics and a participatory methodology for cluster formation. Integrating technology into cluster operations, including digital platforms for market access and resource management, improves efficiency and transparency (Holloway et al., 2022; Zhang et al., 2023). Combining these elements, cluster approaches can effectively address the ongoing challenges of small-holder farming, promote sustainable development, and improve global food security.

2.12 African perspectives on the challenges faced by smallholder farming

Small-holder farming in Africa is vital for food security and rural livelihoods; however, it faces systemic challenges that hinder productivity and sustainability. Critical challenges include restricted access to essential inputs, including quality seeds, fertilizers, and contemporary agricultural technologies, influenced by increased costs and ineffective supply chains (Tittonell et al., 2020). Furthermore, numerous smallholder farmers manage fragmented landholdings characterized by low economies of scale, which hinders their ability to adopt mechanization or leverage agricultural innovations. Constraints impede the competitiveness of African smallholders in local and global markets, highlighting the need for collaborative models such as clustering to address resource limitations and improve collective bargaining power (Moussa et al., 2022).

Market access constitutes a critical challenge for African smallholders, intensified by inadequate infrastructure, fragile value chains, and restricted access to information. Farmers frequently sell their produce at local markets characterized by intense competition and low prices, making them susceptible to exploitation by intermediaries (Kansiime et al., 2021). A cluster approach effectively addresses these issues by organizing smallholders into cooperative groups, which facilitate bulk marketing, shared logistics, and collective price negotiation. Research from East Africa indicates that farmer clusters facilitate enhanced market connections, increased access to agro processors, and diminished postharvest losses via collective storage facilities and transportation networks (Olvermann., et al., 2022; Mutonyi et al., 2023).

Climate change poses a significant challenge for African smallholders dependent on rainfed agriculture. Unpredictable weather patterns, extended droughts, and flooding events significantly impact crop yields and farmer incomes (Thornton et al., 2020). Clusters can alleviate these effects by consolidating resources for investments in climate-smart agricultural practices, including water harvesting systems, drought-resistant crops, and early warning systems. Additionally, clusters can improve access to funding for

climate adaptation, as financial institutions tend to favor lending to organized groups over individual farmers (Alhassan et al., 2022; Kouame et al., 2022).

Implementing cluster approaches in Africa requires the resolution of sociocultural and institutional barriers, despite the associated benefits. Traditional land tenure systems and power asymmetries within communities can restrict cooperation and equitable resource sharing (Asante et al., 2021; Van Hoyweghen et al., 2021). Investment in capacity building, participatory governance frameworks, and policies that promote cluster formation and sustainability is essential for governments and development partners. Integration of digital technologies to enhance coordination and market linkages can improve the effectiveness of clusters in improving the livelihoods of smallholder farmers in Africa (Zhang et al., 2023).

2.13 South African perspectives on the challenges faced by smallholder farming

Smallholder farming in South Africa is critical for rural livelihoods and food security; however, it encounters various structural and systemic challenges. Key issues include land tenure insecurity, restricted market access, and insufficient agricultural infrastructure. Numerous smallholders engage in agriculture on communal lands characterised by weak property rights, which hinders long-term investment in agricultural development (Fine 2020; Kirsten et al., 2021). The absence of connectivity to urban markets and agroprocessing facilities isolates farmers from value chains, thus diminishing their competitiveness and profitability. The challenges highlight the need for innovative solutions, such as clustering, to improve smallholders' capacity to collectively address barriers and gain from economies of scale (Mmbengwa et al., 2022).

Market access constitutes a significant barrier for South African smallholders, exacerbated by the unequal distribution of resources and systemic exclusion from formal agricultural supply chains. Smallholders often depend on informal markets or sell their produce at reduced prices because they cannot meet the strict criteria set by large retailers (Mogale et al., 2023). A cluster approach facilitates the aggregation of products, the standardization of quality, and the negotiation of improved market terms. Clustered

farmers in Limpopo Province have successfully met market standards and accessed urban consumers through cooperative marketing initiatives (Ngcobo et al., 2022). These approaches require scaling and must be backed up by policies that address challenges in transportation, storage, and logistics.

Climate change adversely affects South African smallholders, who primarily rely on rainfed agriculture, thereby intensifying their challenges. Recent years have seen an intensification of droughts, heatwaves, and erratic rainfall patterns, which have significantly impacted crop yields and livestock production (Ntombela et al., 2021). Cluster approaches improve resilience through collective investments in water infrastructure, such as shared irrigation systems, and by promoting the adoption of climate-smart practices, including conservation agriculture. Clusters facilitate access to climate financing and extension services, which are often inaccessible to individual smallholders. Collaborative strategies are essential to maintain the sustainability of small-holder agriculture in the context of changing climatic conditions.

The implementation of cluster-based strategies in South Africa faces socioeconomic and institutional challenges, such as resistance to cooperative systems and governance issues within clusters. Power imbalances and mistrust among farmers may impede the effectiveness of these initiatives. Participatory governance models and capacity-building programs are crucial to address these concerns (Ncube et al., 2023; Bansah et al., 2023). Integrating digital technologies to facilitate coordination, improve transparency, and improve market linkages can significantly improve the effectiveness of clusters. Addressing these challenges enables cluster approaches to transform smallholder farming in South Africa, promoting inclusive growth and sustainability, and enhancing the sector's contribution to national food security.

2.14 Existing knowledge gaps concerning the implementation of cluster approaches

Cluster approaches in agricultural development have demonstrated the potential to improve productivity and market access; however, notable knowledge gaps persist with respect to their implementation in various contexts. A significant gap exists in

understanding the socioeconomic factors that affect farmer participation and commitment to clusters. Cultural dynamics, land tenure systems, and dominant power structures significantly influence the outcomes of clustering initiatives; however, these elements are not incorporated adequately into cluster development frameworks (Ncube et al., 2023). The lack of comprehensive studies on the inclusivity of clusters, especially with regard to the empowerment of marginalized groups such as women and youth, restricts their ability to promote equitable development outcomes (Moussa et al., 2022).

A significant area of uncertainty is related to the scalability and sustainability of cluster approaches. Although pilot projects show encouraging results, the challenge persists in converting these achievements into widespread, sustained effects. Resource allocation, governance structures, and market integration mechanisms are often inadequately understood, resulting in inconsistencies in cluster performance (Dureti et al., 2023). Furthermore, empirical evidence is required regarding the adaptability of clusters to external shocks, including economic recessions or climate-related disasters, to maintain their resilience and relevance in dynamic agricultural contexts (Thornton et al., 2020).

Integration of technology within clusters signifies a significant knowledge gap. Digital tools can improve coordination, improve data collection, and facilitate market linkages; however, their adoption is still limited, particularly in rural areas facing infrastructure challenges (Zhang et al., 2023). More research is required to assess the practicality of implementing digital platforms for resource management, financial transactions, and communication within clusters, alongside the necessary capacity-building initiatives to empower smallholders in using these tools effectively. Failure to address these technological barriers may hinder clusters from achieving the efficiency and innovation necessary for transformative agricultural development.

Finally, more research is needed on the alignment of policies and institutional support for the implementation of clusters. The literature indicates a disconnect between cluster initiatives and national agricultural policies, resulting in fragmented support and duplicated efforts (Mmbengwa et al., 2022). Harmonizing policies across sectors and levels of government is crucial to establishing a conducive environment for the success of clusters. Furthermore, research should investigate the function of public-private

partnerships in the financing and maintenance of clusters, as well as the governance frameworks that most effectively guarantee accountability and inclusivity. Addressing these gaps is essential to improve cluster approaches and improve their potential impact on smallholder farming systems.

2.15 Conclusions

The challenges encountered by small-holder agriculture, both globally and locally, highlight the need for innovative strategies to improve productivity, sustainability, and market integration. Smallholders around the world face constraints due to limited resource access, inadequate infrastructure, and market exclusion, while climate change intensifies these vulnerabilities (Thornton et al., 2020; Moussa et al., 2022). Cluster approaches provide a means to tackle these challenges through collective resource utilization, market access, and resilience enhancement; however, notable knowledge gaps persist with respect to their implementation. In South Africa, issues such as land tenure insecurity, fragmented value chains, and socioeconomic inequalities complicate the implementation of cluster-based strategies (Mmbengwa et al., 2022). To address these challenges, it is essential to align global lessons with local realities, emphasize participatory governance, and leverage digital innovations to develop more inclusive and efficient agricultural systems (Zhang et al., 2023).

Integrating value chains and improving cost efficiency are essential in the South African agricultural context to ensure the sustainability of smallholder clusters. Value chain integration connects farmers to markets and enhances competitiveness by reducing transaction costs and improving product quality standards (Mogale et al., 2023). Cluster approaches facilitate collective bargaining, shared infrastructure, and coordinated logistics, thereby enhancing cost efficiency. To realize these benefits, it is essential that policies prioritize the development of rural infrastructure and offer financial and technical support for cluster formation. Additional research is required to enhance cluster models, ensuring they effectively tackle localized challenges while incorporating global best practices. In conclusion, integrating cluster approaches within the larger context of value chain integration and cost efficiency is crucial for the transformation of smallholder

farming into a viable and sustainable sector in South Africa (Ncube et al., 2023; Ntombela et al., 2021).

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the research methods used to collect data to examine the cluster development approach's effect on smallholder farmers' development. The section includes research methods, approach, design, data collection, population and sampling, data analysis, and research ethics.

3.2 Approach

Research employed the qualitative research approach because it is inclined to seek understanding and meaning of a phenomenon and to capture the lived experiences of people (Stuckey, 2013; Manning, 1992). It allows the researcher to gather in-depth information by allowing people to describe a phenomenon according to their understanding and perspectives (Copley, 2022). Due to its naturalistic nature, the approach generates rich data, allowing the researcher to understand the phenomenon comprehensively (Cresswell, 2013; 2014; Teherani et al., 2015, Tuffour, 2017).

The approach tries to understand and explore meanings individuals attach to their experiences. It mainly focuses on understanding the complexities of the social world, and seeks to understand the “what”, “where”, and “how” of a phenomenon rather than “how much”. It is concerned with gathering and interpreting non-numerical data to understand the social environment and human beings (Adedoyin, 2020). Its suitability for conducting in-depth interviews made it suitable to explore complex matters. It allows the researcher to employ empathy, curiosity and flexibility when listening to people's experiences (Tuffour, 2017). It uses life experiences, stories, observations, and visual texts which enable the researcher to generate data (Mohajan, 2018).

3.3 Research design

The case study was chosen because the effect of clustering on the smallholder sector was relatively unknown. The design offers the advantage of investigating the phenomenon in its real-life context. Furthermore, it allows the researcher to describe the phenomenon under investigation accurately (Zainal, 2007). The design allows for detailed individual and group descriptions because case studies are exploratory, descriptive, and explanatory (Baxter & Jack 2010).

The study aims to answer questions such as 'how' and 'why', without influencing farmer behavior. In the study, individual farmers and communities were the subjects of the case analysis. The case study was chosen because it allows for an in-depth review of complex social phenomena (Yin, 2009; Ghauri et al., 2022). It allows the phenomenon to be examined through various lenses which results in the understanding of the phenomenon in multiple facets (Baxter & Jack, 2010). The design allows the examination of data at low levels and in small geographic areas, using limited cases to describe the phenomenon comprehensively. In its nature, the case study allows a differing view of reality, resulting in the generation of different hypotheses (Yin, 1984).

3.3. Data collection

This study utilized interviews as a method of collecting data. In research, interviews are defined as the process of exchanging views between two or three people on a topic of mutual interest. Data are collected in the form of conversations in interviews (Monday, 2020). It involves the researcher coordinating the process of the conversation and the respondent answering the questions. In qualitative research, interviews are the primary data collection tool (Opdenakker, 2006). The method was chosen because data could be collected anywhere, without inconvenience to the farmer. When an appointment was made, it was difficult for farmers to turn down a researcher at the doorway (Neuman, 2012). The meetings were arranged to meet the farmers in a comfortable environment for the farmers (Jennings, 2005).

The study used face-to-face interviews because they are suitable for collecting data, particularly in the small-holder sector, where farmers could find it difficult to respond to written questions. Additionally, the method also enables the researcher to ask complex questions (Easwaramoorthy & Zarinpoush, 2006; Jennings, 2005). Allows for the spontaneity of reactions to questions without an extended reflection on the question, increasing the likelihood of correct data compared to other techniques. Furthermore, its flexibility allows for the posing of new questions, follow-ups, probes, and comments that allow the researcher to explore the thoughts and beliefs of the interviewee (Marshall, 2016; De Jonckheere & Vaughn, 2019; George, 2023). The method allows the researcher to act as a catalyst, offering an opportunity for farmers to investigate themselves. The researcher only provides an atmosphere, creates a rapport, and involves the farmers to answer questions honestly (Neuman, 2012; Opdenakker, 2006). The method uses the questions as a guide, allowing the researcher to change topics and diverge from the areas previously raised in the interview based on the interviewee's responses (Drever, 1995). It allows for interviews to be recorded, making it easier to write reports because the captured information is more accurate than writing notes (Opdenakker, 2006).

3.4. Population and sampling

The population is important to determine who is eligible for the study. The target population becomes the basis for applying the results of the research to other populations that are relevant to the study (Sutton & Austin, 2015). The target population in the study was the smallholder farmers in Blouberg Municipality who were members of a cluster producing potatoes for the market. The reason for choosing the study target was that the researcher could not study the entire population of smallholder farmers in the area. A sample was selected out of the targeted population to answer a research question. The selected sample was large enough to generate new information until a point of saturation. A point of saturation is reached when no new information is forthcoming (Patton, 1990).

3.4.1 Population

The study targeted small farmers who buy and sell their products as a group. Those whose relationship is not governed by any legal arrangement, but by their willingness to work together in producing potatoes for the market. These are the farmers involved in the sharing of labor, expertise, and machinery. The study focused on these farmers because the researcher wanted to understand the factors that make them succeed and join together in a group. The data collected from the study was also meant to help land reform practitioners improve farmer support programs.

3.4.2 Sampling

The study collected data from farmers within the selected clusters until a point of data saturation was reached. The saturation point is reached when no new information emerges even with further data collection. When that happens, the researcher will know that he has reached an adequate sample size (Hennink & Kaiser, 2021).

3.4.2.1 Sampling method

To arrive at appropriate findings, the appropriate sampling procedure for the study must be selected (Lopez and Whitehead, 2013). In the qualitative research approach, nonprobability sampling is utilized. Data are collected until a saturation point is reached, which is reached when no new information is generated (Robinson, 2014). For the study, purpose-sampling will be used because it saves time and is cost-effective. It allows the researcher to use his judgment in selecting the units to be studied and provides a range of sampling techniques. The researcher may decide to use a critical sampling technique or expert sampling for further investigation (Sharma, 2017).

The method allows for the matching of the study context with the data sources, giving the researcher latitude to choose the sample that suits his expertise. In this way, it eliminates all irrelevant members of the population. Collecting information from relevant participants lowers the margin of sampling error (Obilor, 2023).

3.5 Data analysis

During data collection, information gathered during interviews and observations is stored in an unstructured manner. Data analysis is the process that starts immediately after collection and involves structuring data in a way that can be understood. The process attempts to make sense of the collected data to better understand the phenomenon under investigation (EDUBA, 2023). The process involves sorting, coding, and categorization of the collected data (Wong, 2008; Relacion, 2020). The process results in the emergence of themes and patterns (Atlas, 2023). The process explores data to extract meanings and pictures that assist the investigator in answering the research question (Tashakkori and Teddie, 2003; Patton, 2002).

The study used the thematic data analysis technique due to its flexibility and accessibility. The technique was chosen because it can be used in different qualitative investigations that require large amounts of data to understand complex phenomena, as it enables the researcher to code and analyze the data (Dawadi, 2020; Dovetail, 2023; Braun & Clarke, 2012).

Data generated by interviews result in the emergence of themes that allow the researcher to confirm or expand into new themes (Galanis, 2018). The technique, therefore, assists researchers in identifying patterns and themes from the collected data and can be used with different frameworks to arrive at the answer to the research question (Jnanathapaswi, 2021). The study on the effect of clustering on the development of smallholder farmers will collect information from farmers based on their experiences, making thematic analysis a more appropriate method of analysis (Dovetail, 2023).

3.6 Research ethics

It is the responsibility of the researcher to respect and avoid causing harm to the respondents during the data collection process (Makola & Ntoyanto-Tyatyantsi, 2023). Therefore, the researcher should maintain the dignity and respect of the participants from data collection until dissemination (Arifin, 2018). Before embarking on the data collection

process, the researcher applied and received ethical clearance from the University of the Free State. The certificate was shared with the stakeholders involved in the cluster before and during data collection. The study focused on the following ethical considerations:

3.6.1 Anonymity and Confidentiality

During data collection, analysis, and dissemination, the respondent's identity was kept confidential. The site and time of data collection were agreed upon between the researcher and the respondent, giving comfort to the respondent to share information without being heard by other people. To ensure free participation, the researcher explained the purpose of the research, gave the respondent the questionnaire, and explained the rights of the respondent. To ensure that the information was provided freely, the respondent received a consent form to sign. The signed consent form was used as proof that the information was provided freely.

For reporting purposes, information such as sex, age, and race was utilized without identifying the respondents. Furthermore, to ensure confidentiality, the collected data is only accessible to the supervisor and the researcher and will be kept in a safe place for five years and destroyed afterwards according to the University's prescripts.

3.6.2 Honesty

During the data collection process, the researcher honestly explained the objectives of the study. The questions posed by the respondents were also answered honestly. To ensure inclusivity, all members of the group were included without regard to age, gender, and education level.

3.6.3 Informed consent and voluntary participation

Participants were informed about what the study sought to achieve before participating in the research. Before data collection, participants received consent forms to fill out. As part of making informed decisions, participants were advised that they were not obligated

to answer uncomfortable questions. Participants were also made aware that they could stop the interview if they felt they no longer wanted to participate. Participants were informed that their participation in the study was not related to government support.

3.7 Limitations of the research method.

In qualitative research, the findings of the study are only applicable to the groups of people with whom the researcher has interacted and cannot be used as a generalization to the rest of the population (Mwita, 2022). The findings of one cluster may not be the same as the findings of another cluster. The study does not guarantee replication of the findings in a similar study because people behave differently in different situations (Otieno, 2009). The data collected by one researcher might be irrelevant to the other and the experience might be different (Chukwuemeka, 2022).

The study also had a limited period and could not interact with all members of the group. Additionally, organizing interviews with farmers takes time and affects funding (Mwita, 2022).

CHAPTER 4. EMPIRICAL RESULTS AND FINDINGS

4.1 Introduction

The chapter presents the findings of interviews with small-scale farmers producing potatoes in the Blouberg municipality in the Capricorn district. The area is known as the potato belt because of the suitable climatic conditions. Respondents in the study have organized themselves into a cluster of potato producers. Overall, the study investigates the efficacy of the cluster development approach in developing smallholder farmers to achieve economies of scale, access traditional markets, and overcome the failures associated with cooperatives. Chapter 2 highlighted the importance of clusters for achieving economies-of-scale. The results of the study are presented on different themes.

The study used six questions posed to the respondents, which resulted in the emergence of four themes. These themes included the participants' educational background, history of farming (types of vegetables, experience in farming, farmers in a cluster and switching to potato production), success factors for their farming enterprises (Farmers as agents of their development; access to land, markets, finance; stakeholder support (government, commodity and farmer organizations) and location; and risk factors in their farming endeavors (climate change, loadshedding and cable theft, shortage of seed and post-harvest food loss).

4.2 Educational background

The literature indicates a positive link between education level and productivity (Ninh, 2021). Agriculture is based on the use of the soil to produce crops and animals. This requires the farmer to know how to work the soil. An educated farmer can improve his/her knowledge and skills through advanced technologies, research, and extension (Jiva, 2023). During challenging times caused by climate change and the shortage of production inputs, educated farmers can make better decisions. They are the early adopters of technology due to access to information than non-educated farmers. In this way, they can improve their level of productivity (Oduo-Ofori et al., 2015; Reiners & Stephan, 2012).

The study revealed that the farmers differed in educational background, bringing different skill sets to the area. Of the 12 farmers interviewed, seven had post-matric qualifications, whilst one mentioned only having matric, and four never mentioned any educational qualification. In the study, only two farmers had agricultural qualifications, honors and masters, and the rest had no agricultural-related qualifications. Two of the farmers had degrees in engineering and the other two had accounting and political science qualifications.

Although most of the farmers in the study did not have agricultural education, the literature reveals a positive correlation between education and agriculture. Education increases farmers' incomes and economic growth (Ninh, 2023). The increase in production and the planted area is because educated farmers are early adopters of advanced technology. The role of education is observed in developing and developed countries (Reiners & Klaasen, 2012; Alene & Manyong, 2007).

4.3 History of agriculture

The farmers in the study were born and raised in the Blouberg municipality and grew up in households where subsistence farming was common. Similar cultural and social backgrounds provided a foundation for cluster development (UNIDO, 2020). Farming started as a food security initiative, but became commercial. The farming history has five sub-themes: type of vegetables planted, experience in farming, experience in potato farming, cluster membership and switch to potato production.

4.3.1 Types of vegetables

Except for one farmer who produced maize, all farmers in the study area produced vegetables in the early stages of their farming (before the focus on potatoes). Although two farmers also farmed with animals, their animal production served as a support for vegetable production. The original vegetable production helped to lay the foundation for the production of potatoes. In some instances farmers continued producing different vegetables and potatoes. The farmers in the study were all involved in the production of

different vegetables. These included crops such as onions, beetroot, spinach, tomatoes, butternut, and cabbage, which were preferred. Tomato production was dominant until there was a widespread spread of Tuta absolute disease. The disease forced farmers to move from tomato production to potato production, although some still produce other vegetables.

Three farmers are involved in the production of potatoes and pepper dew. Variety of crops helps the farmer maintain a steady cash flow. One farmer is continuing with a combination of cabbage, carrots, and potatoes. Two farmers in the study started with animals and used the profits from selling these animals to develop their potato production. One farmer moved from the production of layers to tomatoes and eventually to potato production.

4.3.2. Experience in agriculture

Experience in agriculture is vital to increasing farm productivity because they adopt new technologies quickly and improve productivity. These farmers study market conditions and produce the commodities required by the market. Because the farmers understand the good agricultural practices and environmental conditions of their production area, they can produce large quantities of potatoes (Mugasha, 2014). Additionally, experienced farmers produce safe and nutritious food without harming the environment (Heide, 2023). The literature also indicates a positive correlation between farm productivity and experience (Chou et al., 1987).

The experience gained during the early years became critical when they switched to potato production. The most experienced farmer in the study started farming in 2001, producing eggs, and later produced cabbage in 2003 on an area of 4ha. One respondent explained this in the following words.

'In 2001, the exchange program I participated in got suspended, and I found employment. With my first salary, I wanted to start what I learned in Denmark. I approached the local authority in Avon for land. After being given land, I started a layer project. '

The combined experience in agriculture of the farmers in the study is 109 years. The propensity to adopt new technologies is greater among experienced and inexperienced farmers, and improved technology results in improved production (Ainembabazi & Mugasha, 2014). Furthermore, farming experience improves entrepreneurialism and personal traits for sustainable production. These traits enable the improvement of the farmer's livelihood and local economic development (Zhou & Li, 2022).

4.3.3. Experience in potato production

In the study group, the level of experience in potato production varies between two and 14 years. The farmer who became the mentor in the area started potato production in 2010, producing in 10ha. The farmer with the least experience in potato production began in 2022, producing 3ha. The production area increased organically from 0.25 ha to 30 ha as farmers gained experience.

4.3.4. Farmers as cluster members

The potato cluster in the study was established in 2018 when farmers realized that they had to be organized to speak in one voice. Furthermore, farmers did not have the machinery and skills to run a successful farming operation. The cluster helps them share implements, knowledge, and market intelligence to improve their farming operations. One farmer said,

"In the cluster, we are exchanging knowledge, information, and equipment. Honestly, I would not have developed into the farmer I am, had it not been for the contribution of other cluster members. "

However, two members of the group joined because the government was unable to assist individual farmers, only groups. One farmer confirmed this by saying:

"I joined the potato cluster in 2021 because the government was unable to help individual farmers, but it can help people who have grouped themselves"

The other farmer said,

'What also motivated me to join the group was the Department's insistence that it would not be in a position to help individual farmers due to the cost of support.'

The other farmer joined because Potato SA was encouraging people to join. One respondent said,

'After the Department declared the area the Potato Belt, Potato SA began to assist us in establishing a cluster of farmers.'

Two members of the study are the founders of the cluster, and the rest joined from 2019 until 2023.

4.3.5 The switch to potato production

Although the farmers in the study started producing other crops early in their farming business, they were all involved in the production of potatoes. Some were motivated by the availability of the market and price, while some switched due to the high incidence of diseases and pests in their preferred crops. One respondent said,

“The main reason we decided to enter potato production was the income derived from potatoes compared to other crops. Furthermore, access to the market and the demand for the crop motivated us to stop the production of other crops and concentrate on potatoes. ’

The other motivating factor for potato production was the climatic conditions of the area, which offered the opportunity to plant the crop twice a year. Additionally, the area was declared the potato belt by the Limpopo Provincial Government. Two respondents also mentioned that the switch was due to the ease of establishing and harvesting the crop compared to tomatoes. One respondent said,

'They are not easily affected by diseases and are easy and inexpensive to harvest compared to crops such as tomatoes'.

However, a respondent indicated that his motivation to switch to potato production was seeing a farmer who had never been to school producing potatoes at a commercial level. He said:

“The other reason I switched to potato production was the inspiration I got from Solly Ratjomana who moved to Avon from Pex and started producing potatoes. I was inspired by the fact that Solly never went to school, but even met my English teacher on his farm. Solly grew up caring for my grandfather’s cattle but had become a commercial farmer. I think I could follow in his footsteps and become a successful farmer. Seeing Solly’s success gave me early exposure to tomato production.’

This statement indicates the presence of role models who were admired by others, resulting in the switch to potato production.

4.4. Factors for development/ Success factors

Conditions required to ensure clusters' development, promotion, and sustainment differ from region to region. Some clusters may need an environment that supports skills and entrepreneurial development. These factors make the cluster competitive (Cartright, 2006; Chen et al., 2022). The following factors contributed to success: farmers as their own development agents, access to land, finance, and market and stakeholder support.

4.4.1. Farmers as agents of their development

Despite working in different environments with constraints, most farmers experience success. The character of the farmer determines whether to succeed or not. To succeed in farming, the farmer must show perseverance, a good work ethic, and patience (Farmers Weekly, 2022).

After acquiring land, six farmers had to clear the land to allow agricultural production. Clearing the land is essential for removing trees, shrubs, and weeds before planting plants. It allows the tractors to move freely, work the land, and the irrigation system to run smoothly. Allows the replenishment of soil nutrients to be used by the planted crop (Adams, 2023).

Farmers in the study viewed agriculture as businesses capable of making a profit and had to take risks to realize the profits. These risks include investments in technology, production inputs, machinery, and irrigation systems (FAO, 2013). All farmers used their savings to buy production inputs such as fertilizers, herbicides, and pesticides. Additionally, one farmer had to buy machinery, the other bought water storage facilities, and four had to drill and equip the boreholes. Six farmers bought irrigation systems to irrigate their crops, while one farmer had to pay 25% of the seed provided by Potato SA.

Farmers took it upon themselves to look for the market for their products. However, one went further and supplied the National School Nutrition Program (NSNP). The other farm was loading his produce into the truck and selling in the village.

The study farmers are taking production loans from VKP and repaying the loans after harvest. However, three farmers approached Kgodiso Financial Services and the Land Bank to apply for production loans. In addition, a farmer borrowed money from his relatives to equip two wells.

In addition to procuring production input, some farmers had to start with fencing their farms, one farmer selling his sheep to fence his farm. The other farmer had to cut trees and use them as fencing. These tree cuttings were used as fencing material for five years. To adequately protect his farm, he bought old fencing material from the villagers and fenced it off.

The farmers in the study were determined to make their farming successful and did not depend on handouts. They started by approaching traditional councils for land, securing markets, drilling wells, and fencing their farms. The support from the government and Potato SA improved their production rather than starting them from scratch.

4.4.2. Access to land

Access to land is essential for agricultural development and entrepreneurialism. Secure tenure is one of the tenets for successful agricultural production and improved productivity and food security (Akowedaho et al., 2022; Mushunje, 2019). In South Africa, smallholder

and subsistence farmers are found in their former homelands where access to land is difficult. Farmers with adequate land can practice rotational farming, allowing land to rest and breaking the cycle of disease and pests (Mdoda & Gidi, 2023).

In contrast to these ideas above about secure land, all farmers in the study are from the villages around the Blouberg municipality, and they farm on communal land managed by traditional chiefs. Traditional leaders have allocated 711.70 hectares of land to farmers through Permission to Occupy (PTO). Although farmers do not own the land because it belongs to the community, they can use the land allocated for as long as they produce. Furthermore, three farmers have been allocated 4226 hectares of land through the government's proactive land acquisition strategy (PLAS), bringing the total area allocated to 4937.7 hectares. This tenure system means that the government owns the land, and farmers are given a thirty-year lease, with the option to purchase (Government of South Africa, 2006).

This indicates that farmers in this area do not have access problems because in South Africa, on average a smallholder farmer accessed approximately 2 hectares (Myeni et al., 2019). Taking an average land allocated per farmer in this study, each farmer has access to 59.308 hectares of communal land through permission to occupy (PTO) and a combination of lease holding and PTO of 411.475 hectares of total allocated land. Access to land is important for economic development, improved productivity, and increased revenue (Akinyami & Mushunje, 2019; Mdoda & Gidi, 2023). The secured tenure stimulates farmer entrepreneurial spirit and improved productivity (Akowedaho et al., 2022).

4.4.3. Access to market

Market access enables farmers to sell their products at higher prices and encourages continuous production. It improves the farmer's income and livelihoods. Besides access, selecting the appropriate market for the type of produce becomes important (Waglin et al., 2024). One of the strategies in fighting hunger and malnutrition is the linkage of smallholder farmers to markets. Market access improves productivity and income (USAID, 2014; IFAD, 2024; Fan & Rue, 2020; Aku et al., 2018). However, smallholder

farmers cannot access markets due to contractual requirements such as the quality and quantity of the produce required and market information (Myeni et al., 2019).

The farmers service three markets of the Mozambican market, local hawkers and the formal market (PEPSICO, Carlitos, Boxer and Spar). Of the three markets, Mozambique is the largest and easily accessible market. The Mozambican market are easily accessible in the area and it is the favored market. To support the assertion, one respondent said,

'The Mozambican market was already established in the area that I needed to concentrate on production.'

When there is produce on the farm, the Mozambicans come to the farm and load everything. One respondent said,

'When the crop is ready for harvesting, all I have to do is go to Global Garage in Dendron where they are always parked.' The staggered production in the cluster ensures a constant supply of the products. It is the steady supply of the produce that attracts the market to the area. Additionally, the availability of the market was due to the negotiations that took place when the cluster was established.

Depending on the quantity, it takes about three days to load everything onto the trucks. The added advantage is that Mozambican market take unwashed potatoes and the farmer does not have to pay for transport. According to the farmers in the study, once there is an agreement on the price of potatoes, they pay immediately. Depending on the back side, the farmer only has to pay the driver R1-2 per bag.

The second market available to all farmers is the local hawkers that sell potatoes in their villages. Although the market is important to the farmers in the area, they take small amounts compared to the Mozambicans. However, farmers still prioritize them despite buying small quantities. One responded said this about this market,

“Besides Mozambicans, hawkers walk to the farm to buy potatoes. The sellers pay a price similar to that agreed with the Mozambicans”.

The other farmer also indicated the importance of this market by saying,

'Potatos are consumed in every household and the market is good.'

Some farmers in the cluster also access formal markets such as Spar, Carlitos, Boxer, McCain, and PEPSICO. However, this market is not open to all farmers in the area. This market is open to farmers with packhouses equipped with washing machines for the potatoes. Those who do not have washing machines are unable to access this market. Though the cluster does not have a potato washing machine, a few individual farmers have. In the study, four farmers were contracted to McCain and one to Carlitos, Boxer, and Spar. These markets are suitable for this kind of farmers because they have more than 2 ha of land and are not far from the market (USAID, 2014). Farmers accessing this array of markets are encouraged to invest in their businesses and improve the quality and quantity of their produce (IFAD, 2024).

4.4.4. Access to Finance

Smallholder farmers need to access finance to help them acquire and use modern technology. To be productive, farmers need to use modern technologies such as improved seeds, fertilizers, pesticides, irrigation systems, herbicides and mechanization (Langyintuo, 2020; Balana & Oyeyeni, 2022; Oyewole, 2022). Farmers need these inputs to improve farm productivity, incomes, and better livelihoods (CSIS, 2022). Farmers use unsustainable production systems without access to finance, leading to poor income and poor commercialization, much to the disadvantage of smallholder farmers (Southern et al., 2013; Southern African Trust, 2013). In addition, smallholder farmers need financing to build the infrastructure to store produce and reduce post-harvest losses. It enables farmers to better manage risks and adapt to climate-related shocks. It ensures market access because they can market their produce at peak prices. Smallholders who do not have storage facilities sell their produce immediately after harvest, leading to low incomes (CSIS, 2022).

The farmers in the study have access to input grants from Potato SA, production loans from VKB and Kgodiso financial services, loans from family members, and Government loans through the Micro-finance Institution of South Africa (MAFISA) and Land Development Support (LDS) grant.

Potato SA implements the Supplier Enterprise Development Program in the area. The program supplies farmers with seed, herbicides, pesticides, and fertilizer. Eight of the 12 farmers in the study received seed from the organization while three received a package that included herbicides, pesticides and fertilizers.

Farmers also have access to production loans from two companies. These companies are VKB and Kgodiso Financial Services. The loans cover production-related expenses such as labor wages, fertilizers, herbicides, pesticides, and farm overhead costs. A total of four farmers received production loans from these two companies, each supporting two farmers.

The government provided two farmers with production loans through the Microfinance Institution of South African (MAFISA). Additionally, two farmers received the Land and Development Support Grant.

A farmer in the study was able to access a production loan from the land bank for clearing and fencing. He was also able to access a production loan from a commercial bank for the procurement of production inputs.

However, three farmers in the study were unable to access loans due to tenure security. These farmers had to fund their farming operations from their savings, while one could get a loan from family members. However, their participation in the cluster ensured that they access production inputs from the commodity organization, mentorship and machinery. Due to the existence of the market and the services offered by the stakeholders, other farmers who started farming on communal land were able to purchase farms, and are able to access loans.

In the study, most farmers could access financing, which made them adopt modern technologies to improve productivity, income, and livelihoods (Balana & Oyeyeni, 2022). It is through access to finance that farmers can make investments on the farm, increase productivity, and access markets (International Finance Corporation (IFC, 2014). Access to finance enables the commercialization of smallholder farmers and the achievement of food security (Southern et al., 2013; World Economic Forum (WEF), 2022).

4.4.5. Stakeholder support

Farmers operate in an environment with multiple stakeholders. These stakeholders include government, private sector, commodity organizations, and civil society. These organizations offer several services to the farmer to ensure the success of his/her farming business (WEF, 2024). The support from these organizations contributes to the transformation of the sector, food security, income generation and sustainability of the smallholder sector. The collaboration between different players in the sector provides the meaningful participation of smallholder farmers in the agricultural food value chain by offering technical and financial services. The support from stakeholders results in improved productivity and rural development (Chamberlain, 2019; Khapayi & Celliers, 2016).

4.4.5.1 Government support

Governments support smallholder farmers in creating jobs and improving food security and livelihoods. Smallholders produce about 50% of food in Sub-Saharan Africa (IFAD, 2020a). Policies and strategies that enhance productivity result in increased income and reduction of poverty (Mokgomo et al., 2020; Aliber & Hall, 2012; Larson et al., 2020). The smallholders are also known to reinvest funds into their businesses, create jobs and improve the standard of living of the rural communities (IFAD, 2020a). Transformation of the agricultural sector is also dependent on the support of the smallholder sector because it contributes to commercialization. The sector contributes food to local communities, improving food diversity (BREAD, 2023; Fan & Rue, 2020).

The budget for farmer support has been steadily increasing since 1990 in South Africa (Aliber & Hall, 2012). According to expenditures and estimates of the National Treasury (2023), the funds allocated for farmer support increased from R16 948.1 billion in 2019 to R18106.7 billion in 2024/25 and is expected to increase to R18884.7 billion in 2025/2026. The government assisted farmers with various support packages to improve productivity, income and job creation (Larson et al., 2020). These packages include

production inputs, irrigation system (pivot) water storage facilities, drilling and equipping wells, and land allocation.

In the study, four farmers were assisted with drilling and equipping five boreholes; four were provided with production inputs for 32.5 hectares; two farmers were provided with water storage facilities; and two were assigned 3400 hectares of land. Only two farmers indicated that they never received government support.

Government support ensures that farmers contribute to rural development and food security and improve the livelihoods of local communities. The contribution of farmers to the rural economy could lead to the reduction of rural-urban migration (BREAD, 2023; Agricial, 2023).

4.4.5.2. Commodity organizations

Commodity organizations play an essential role in supporting small-holder farmers. They help smallholders with services such as the provision of production inputs, technical advice, training, and financial support. These services contribute to the improvement of the income and productivity of smallholders. (Bizikova et al., 2020). Additionally, commodity organizations can assist farmers with services such as mobilization of resources, creation and maintenance of partnerships, and engagement with policy on their behalf (Oyewole, 2022).

Potato SA supports all potato-producing farmers in the Blouberg area. The organization's enterprise development program provides seeds to all farmers. The farmer who benefits from the organization's program said:

"The department helps me with chemicals for only two planting seasons, while Potato SA gives me seed for 7.5ha yearly".

Herbicides, pesticides, and fertilizers support other farmers under the program. Additionally, the organization assists farmers with technical assistance, training, and mentoring. One farmer said of the organization,

'Through the development and mentoring of skills, I received from PotatoSA and the members of the group, I was able to increase my farming operations from 2 ha to 16 ha a year.'

Farmers are trained in bookkeeping, finance, herbicide and pesticide control, disease and insect scouting, and fertilizer application. The organization also assists farmers in complying with the South African Revenue prescripts by keeping records of income and expenditure. To further improve technical skills and motivate farmers, the organization organizes exposure visits to successful farms.

4.4.5.3. Farmer organization

Farmer organizations are crucial for enhancing farm productivity, income generation, and rural development. The organized formation can provide services to its members, speak on their behalf on policy matters, and improve social integration. When farmers are in an organization, they can share information and machinery and access a common market. The organization improves the bargaining power of farmers and allows smallholder farmers to pool resources when buying production inputs, thereby reducing transaction costs (IFAD, 2018; Insights, 2024).

The farmers in the study organized themselves into a cluster and managed to access a common market. They secured the Mozambican market, which takes unwashed potatoes and provides transport. Furthermore, seven farmers could secure formal markets such as PEPSICO, McCain, and Tiger Brands. The cluster controls the price by managing the planting schedules of the farmers within the cluster. A farmer indicated the benefit of a cluster by saying:

'The group has made it possible to manage the price of potatoes in the area because we practice staggered production so that the market is not flooded with the crop.'

Farmers in the cluster improved their productivity because they had access to machinery, support from other farmers, and technical know-how. One farmer said:

'Farmers can borrow machinery from other farmers to carry out certain farming operations at no cost. Farmers also benefit by purchasing production inputs in bulk and receiving discounts from retailers.

The other farmer reiterated the importance of a cluster by saying:

'I started being a member of the group in 2018 because I realized early that I didn't have the skills and machinery to be a successful farmer. I needed the expertise within the cluster to be able to grow proficiently and access the markets. My farming operation is very successful and I am on the verge of buying a 424 hectare farm. I would not have been able to be a competent farmer if I had operated outside the cluster, I have received a lot of help in terms of skills and machinery to be where I am today”.

One farmer said,

Being in a cluster also assisted in buying input from manufacturers rather than through a retail outlet '.

The other farmer emphasized the importance of cluster membership by saying,

'The group also assisted in the bulk purchase of production inputs, so being a member of the group, I benefited from the discounts offered to the group.'

In addition to the services offered by the farmers within the cluster, the farmers have attracted other stakeholders in the potato value chain who supported them with inputs for production, training, mentorship and infrastructure. The government supported the cluster with machinery, and private companies supported the cluster with infrastructure. Therefore, the farmer organization helps individual farmers access services and inputs at lower costs than those who are not part of the organization.

4.4.6. Location

Location is very important in any business, as it fosters collaboration among producers and attracts more customers, leading to business growth. Additionally, it has a positive

bearing on the productivity of the company and its growth (Porter, 2000). Businesses located near suppliers can reduce transport costs by reducing transport costs and making the business competitive (InvestinAsia, 2024).

Farmers in the study are producing in an area that can produce potatoes twice a year. One farmer said,

'The Limpopo province has a special window for potato production. Except for farmers in Limpopo, no one in the country can plant potatoes in March, April, and May, due to the favorable climate in the province - the 'Limpopo province can only compete with itself'

Another farmer agreed with the first farmer by stating:

"The farm is in the Limpopo potato belt province, known for producing large quantities of potatoes, so shifting to potato production was only natural. The area has a comparative advantage because potatoes in this part of the province can be planted twice a year. '

The other farmer emphasized the importance of the location by stating:

'It is expensive to buy production inputs and it costs more to transport the produce to the farm. As farmers in a cluster, we can share the transportation costs thereby reducing transaction costs for each of the cluster members.

The farmers in the area are producing under ideal conditions for potato production, giving them a competitive edge. Due to its uniqueness and competitive advantage, the government of Limpopo has declared the area the potato belt (Nufarmer Africa, 2023).

4.5. Risks

The agricultural field is beset with various risks that a farmer must manage. The uncertainties related to yields, weather, prices, global markets, and government policies affect farm productivity and income. The farmer is responsible for managing these risks to ensure food security, job creation and sustainable production and that value chains are not disrupted (Farming et al., 2023; Platform for Agricultural Risk (PARM), 2018; Just

Agriculture, 2022). One of the production risks is climate change, which causes disruptions in the market and throughout the value chain, resulting in poverty and food insecurity. It shifts the frequency and intensity of risks such as floods, droughts, rising temperatures, and outbreaks of diseases and pests (OECD, 2020; USDA, 2024; World Bank, 2016; Duong et al., 2019).

The other two risks confronting rural farmers are lack of infrastructure, crime, and persistent power outages that have ravaged the South African economy (Farming et al., 2023). These risks, if not properly managed, can undermine the viability of the agricultural sector, undermine farmer livelihoods, and affect rural economies (Just Agriculture, 2022). Farmers in the study were affected by various risks that threatened their businesses. These risks included climate-related, financial risks, power outages, and theft.

4.5.1 Climate change

Smallholder farmers are vulnerable to the effects of climate change on the African continent. Climate-related risks affect them, including temperature variations, floods, droughts, and hailstorms (Farmer's Weekly, 2016; Oyewole, 2022).

Farmers indicated that climate change is threatening their agricultural businesses in the study. One farmer said this about the effects of climate change,

“Climate change is a challenge to the farmers in this area. We are experiencing excessive rainfall and heat. Climate change has brought about pests and diseases that do not respond to the chemicals we normally use. Because of climate change, the pests become active earlier during the year, beginning the early planting season from August to May. To adapt to climate change we start planting early in May to avoid harvesting during the rainy months”.

Six farmers were affected by the outbreak of *Tuta absoluta*, which was resistant to the chemicals even after increasing the dosage and frequency of application. The pest's reproductive rate, life cycle and distribution are enhanced by the increase in the thermal temperatures brought about by climate change (Azrag et al., 2023). The severity of the

disease led to the abandonment of tomato production by these farmers. However, one farmer indicated that he has experienced a surge in pests and diseases that are difficult to control on other crops. He attributes the surge in the number of eggs laid by pests, which are difficult to wash away by an irrigation system.

Five farmers indicated climate change effects that affected their businesses. These included the unpredictability of the rainfall pattern. Farmers can no longer predict the rainfall season, leading to improper planning of the planting season. One farmer said,

“I can no longer read the climate, making it difficult to prepare for the planting season, resulting in increased costs”.

The planting season should coincide with the start of the rainy season so that crops can get enough water to grow. However, farmers must depend more on the use of wells, leading to the depletion of the underground water. Additionally, the change in the rainfall pattern has led to the shift in the early planting season from August to May, which means that farmers who start planting late risk losing their crops during the rainy season. During the rainy season, harvesting is difficult, leading to deterioration of the product and the market price.

Farmers experienced an extended heatwave and drought in March, forcing them to extend the frequency and irrigation period. The heat wave increased evaporation, so the irrigation frequency had to increase. One farmer said,

'Permanent drought affects underground water'.

The area was also affected by frost in June when the crop was stacked, leading to the production of small potatoes and a loss of income. Furthermore, the area also experienced flooding, which affected agriculture and livelihoods.

4.5.2 Loadshedding and theft of power cables

The country experienced power outages that affected businesses, the economy, and consumers (Farming et al., 2023). Many South Africans had to endure load shedding for up to eight hours, which affected farmers who needed electricity to pump water and run

irrigation systems (SOLY, 2023). The loss of load also led to the breakdown of irrigation systems, leading to increased costs, low yields, and financial and job losses (ADAMA.2023).

Farmers in the study were also affected by load shedding, leading to losses and low production. Four farmers indicated that load shedding has hurt their farming business. During these outages, criminals also stole electric cables, affecting irrigation systems. A farmer affected by load shedding and theft said,

'Criminals stole my transformer and cables in the middle of the planting season, resulting in small potatoes'.

He said 'He said'.

I planted 15 acres of potatoes for McCain, but due to load shedding, the size of the potatoes was small and the company did not take small sizes.'

This means that the farmer suffered financial loss due to load shedding and had to look for an alternative market for his produce.

4.5.3. Price fluctuations

Fluctuations in market prices hurt small businesses. However, when the price is reasonable, farmers benefit, but suffer when the price drops. The market forces of supply and demand are often cited as the reasons for the increase or decrease in prices. However, the development of smallholder farmers requires stable prices (Huka et al., 2014).

In the study, four farmers indicated that price fluctuation is a risk. Although farmers can negotiate with Mozambicans, they always consider making savings, particularly towards the beginning of the rainy season. This is exacerbated by the lack of storage infrastructure of farmers, making them vulnerable to accepting low prices. The storage facility will allow them to sell when the prices are favorable. One farmer said,

'When the potato is still underground and the rainy season is about to start, the market buys at lower prices because they know that if you do not sell, you risk losing the whole crop'.

When the rainy season starts and the potatoes are still underground, they start growing again and would not be acceptable to the market. Additionally, farmers supported by the government get their inputs simultaneously by providing production inputs, resulting in their crops being ready simultaneously and affecting market prices.

4.5.4. Seed shortage.

Seed is the primary input in any agricultural food system. They are responsible for sustaining human and animal life. Food security, therefore, starts with the quality of seed because it promotes production in agriculture. No agriculture will be without seed (Mcquire & Sperling, 2016; Wimalasekera, 2015). For any food system to survive, it needs a high-yielding seed adaptable to the local conditions and can withstand the prevailing diseases and pests (Elias, 2018).

Farmers in the study are getting seeds from reputable companies in Kwazulu Natal. However, most of the seed companies are having relationships with the big producers. One said,

'However, most seed producers have relationships with the most prominent producers, making small farmers struggle to access seed.'

The farmer must inform the producer in time because producers must produce the correct amounts of seed. After all, if they produce more, the seed will rot. Small farmers can buy seeds after the big producers have been served.

Because the seed is coming out of the province, it still needs to be acclimatized, which means that a season can be lost during the acclimatization period. Seed shortages for farmers in the area could cause disruption of their farming businesses and loss of income (Elias, 2018).

4.5.6. Post-harvest food loss

Around the world, and particularly in developing countries, food loss is the leading cause of food insecurity and financial loss. The loss occurs in the supply chain stages when the food is damaged, lost and spoiled during harvesting, processing, and storage (Farmers Weekly, 2022). Losing food means production inputs, water, and land are also lost, resulting in financial loss for the farmer. Many smallholders experience post-harvest food loss due to a lack of storage facilities and suitable technologies (Ricker-Gilbert et al., 2022; Oyewole, 2022). Their inability to invest in cold storage facilities means that they store their produce in inappropriate storage facilities. This forces them to sell their produce immediately after harvest, even when the price is low or results in an oversupply of the commodity on the market (WFP, 2022; Farmers Weekly, 2022).

Six farmers in the study indicated that the lack of packing houses hindered their agricultural businesses. Farmers indicated that they need storage units to store their produce and allow trucks to load during the rainy season. One farmer said:

'Today, potatoes are sold unwashed, but if it rains during harvest, the quality of potatoes deteriorates, affecting the price'.

The other farmer emphasized the need for a storehouse to avoid post-harvest losses by saying:

'When the potato is still underground and the rainy season is about to start, the market buys the product at a lower price because they know that if you do not sell at that time, you risk losing the entire crop.'

Rainfall creates a conducive environment for potatoes to grow. Once they start growing, they are no longer acceptable to the market. Therefore, the farmer would have lost the entire crop that was ready for harvest.

In the potato business, the storehouse is also used to store the seed. The seed needs a cold storage facility to maintain its quality. Seeds stored at house temperature will start to grow before the planting season, leading to poor quality and quantity of the produce (Farmer's Weekly, 2020). One of the farmers said:

'Additionally, as farmers, we need to have adequate storage for our seeds, and a storage room offers a suitable environment for seeds to lay dormant before they are ready to be planted.'

To manage the price in the cluster and practice staggered production, farmers need infrastructure that will allow them to store seed and produce. A packhouse is necessary when supplying the formal market because the market wants washed potatoes. The package house allows farmers to manage price fluctuation in the market by not selling at the same time.

4.6 Conclusions

A successful cluster will consist of farmers who are educated and possess agricultural knowledge and skills. Experience can be gained by starting a small agricultural project and using the knowledge gained when moving to a larger area. The study shows that communal land, if properly used, can result in a commercial entity. Once the farmer gains access to land, he/she must become innovative to make it a viable enterprise. Once acquired, the land will need fencing, the development of the irrigation system and machinery to become operational, and the farmer's determination and willingness to succeed becomes important.

To make the farm venture successful, the farmer needs the support of the government and institutions in providing finance, training, infrastructure, machinery and mentorship. When institutions provide support to farmers, they stimulate the entrepreneurial spirit of the farmer and will become innovative in making the business a success. In the study area, Potato SA is playing a supportive role in cluster farms by organizing training, providing production inputs, and mentoring services. These services contribute to the increase in the productivity of farmers through knowledge transfer and the adoption of new technologies.

Access to the market is an important ingredient in the success of the cluster. When farmers know that they have a market, they concentrate on producing the best quality products to satisfy the market.

The location of the farm that supports the production of a particular crop gives the farmer a comparative advantage. A good location with natural resources that support production allows the farmer to produce goods at low cost and be able to sell the products at competitive prices, thereby increasing the farmer's income.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter will provide conclusions based on the findings of the previous chapter. The outline will be based on the following headings: Overview of chapters, main conclusions, and recommendations.

5.2. Overview of chapters

Chapter 1 introduces the concept of cluster development as a tool for economic development. The chapter also captures the problem statement related to the high failure rate of small businesses in South Africa, although the government has identified them as a means of creating jobs. The chapter further captures the study's aims and objectives. The study investigates the use of the cluster development approach to overcome the failures associated with cooperatives and assist small farmers to achieve economies of scale and access markets.

Chapter 2 provides a review of the literature on the cluster development approach. The literature demonstrates the positive role of the cluster development approach in small business development. It indicates that companies save on building infrastructure and materials and attracting material suppliers and personnel. The literature also indicates the positive effect of clustering in the agricultural sector, resulting in increased productivity, access to markets, and research.

Chapter 3 presents the study methods. The study uses a case study design with a qualitative approach and thematic data analysis. The thematic data analysis technique was selected due to its flexibility and accessibility. It also clearly describes and interprets themes and patterns from the collected data. It allows the researcher to decode and analyze the qualitative data.

Chapter 4 presents the findings of the interviews with small-scale potato-producing farmers in the Blouberg municipality of the Capricorn district. The study used six

questions and five themes emerged from the data. The themes included the educational background of farmers, the history of agriculture, success factors, location, and risk factors.

5.3. Main Findings

This section presents the main findings of the cluster development approach as found in the literature. These findings will be compared with the data captured in the study of the cluster development approach in the Blouberg area.

5.3.1. Strong relationships of companies within the cluster

Strong relations between companies in the cluster and beyond enable the generation of economies of scale, cost reduction, and improved product quality. Strong bonds result in successful clusters (Boon-kwee et al., 2017). Strong relationships make information transfer less complicated (Dresher-Hackel & Diarte, 2011).

In the study area, individuals became friends before becoming farmers, resulting in high trust within the group. Trust results in farmers borrowing equipment and machinery from each other, trusting in the information provided by fellow farmers, and believing in the leadership of fellow farmers.

The study's findings support Porter's (1999) and Fioravanti et al. (2021) observations that good relations among cluster companies result in trust and facilitate communication and information flow. Furthermore, the study found that the farmers in the cluster were friends, echoing the findings of Elche et al. (2018), who state that once companies establish trust, it encourages innovation and reduces opportunistic behavior. Kayley (2017) observed that good relations in the cluster induce high levels of productivity, skills transfer, and innovation. In the study, farmers assisted each other with production inputs and equipment, resulting in farmers saving their production season and improving production. The experienced farmer in the cluster was also involved in assisting farmers in applying improved production technologies by visiting farmers and showing them how to plant

potatoes. This resulted in skills transfer and the adoption of new technologies, further corroborating the observation by Kayley (2017). Furthermore, Srekovi and Windsperger (2013) note that when trust within the cluster is based on experience, the level of knowledge transfer becomes significant. Furthermore, the close ties between farmers resulted in one farmer lending an irrigation pump to another when he did not have a power supply on his farm.

5.3.2. Transfer of knowledge from one member to the other in a thriving cluster

The cluster maintains a competitive edge through the transfer of knowledge between the cluster members. The cluster's success depends on the knowledge transfer between members (Lee et al., 2012). Knowledge is appreciated by innovative firms seeking to strengthen their competitiveness and expand relationships with stakeholders (Zhang & Xu, 2022). Improve the performance of individual firms within the cluster and economic growth. Furthermore, to enhance information transmission, strong clusters build the infrastructure to access information generated outside the cluster to improve the performance of individual firms (Corker et al., 2024).

In the study, Potato SA and the government are involved in information transfer and skills through farmer days where suppliers, specialists, and farmers exchange information. Potato SA also organizes training sessions where farmers are trained on herbicide application, pest control, record keeping, fertilizer application, and business management. Additionally, the organization hires mentors responsible for farm training and knowledge transfer.

In addition to possessing knowledge and skills in the potato industry, Potato SA, suppliers and government specialists had strong relationships with farmers, enhancing knowledge transfer. The results are similar to the findings of Drescher-Hackel and Diarte (2011) in Sweden, which also suggest that strong relations improve knowledge transfer. The results also corroborate the findings of Dahl and Peterson (2013) that information is transferred through formal and informal training in the cluster.

5.3.3. Cluster members should have an entrepreneurial spirit for prosperity.

Entrepreneurship is defined as an individual who creates a new business. It is about generating new business capital by creating new products, scaling them, and making a profit. Entrepreneurs see problems as opportunities and create ways of overcoming them (Villacci, 2023).

Farmers agreed to practice staggered production to avoid flooding the market with produce to continue uninterrupted supply. Farmers understand the principle of demand and supply and agree to stagger production to avoid oversupply in the market, which could affect the price. Additionally, two farmers in the cluster bought farms to increase the production area and maintain the strength of the cluster in the market.

The findings in the study are similar to those of Seth et al. (2024). After all, farmers started small, using poor resources to establish and operationalize their farms without establishing a market. Farmers in the study had to improve and make their business successful despite the uncertainty of their business. These findings resonate with those of Ewing et al. (2020), who found that entrepreneurs improvise in developing their products and manage processes in situations of uncertainty. Seth et al. (2024) observed that entrepreneurs risk their careers and finances to develop their products regardless of market uncertainty. In the study, farmers had to use their savings and loans to invest in the production of potatoes without signing an offtake agreement with any market. Although their biggest market is the Mozambicans, farmers have not entered a formal contract but invest in the production of potatoes. However, the Mozambicans buy everything on the farm, and one farmer indicated that it takes them up to three days to load the produce onto the trucks.

5.3.4. Institutional support plays a huge role in the success of the cluster.

Supporting small businesses to drive economic growth in a developing country is essential. Institutions that support small businesses are crucial to creating a conducive environment for innovation and development. These institutions provide various support,

such as market linkage, skills development, financial assistance, and opportunities for networking and innovation (Guttentag, 2019).

In the study, four support institutions (Land Bank, MAFISA, PotatoSA and Kgodiso Financial Services) support farmers, increase productivity, reduce risks and attract investors and customers. The Land Bank provides loans for production, land and equipment and Kgodiso Financial Services provides production loans and training.

The farmers receive loans for production and equipment from MAFISA, while PotatoSA assists farmers with production inputs, training, and mentoring services. These organizations help farmers expand their businesses and develop training programs to address the skills gap identified.

The findings resonate with Gowri et al. (2024) and College Hive's (2024) observation that, for small businesses to grow, they need assistance with management and production-related issues in the early stages of the establishment. The mentorship offered by Potato SA, Kgodiso Financial Services, and Land Bank ensures that farmers are supported until they reach the stage of sustainability. Furthermore, the findings support IFAD (2020b) and Toni (2023) findings that supporting institutions provide input and mentoring services to improve survival rate, reduce costs and improve productivity and market access. College Hive (2024) found that when firms are supported, they attract investors, markets, and customers and reduce risks. In the group, the support from Potato SA, MAFISA, Land Bank, and Kgodiso Financial Services resulted in improved production, attracting customers, and markets.

5.3.5. Cost-sharing practices and payment of fees

Cluster firms attain economies of scale by reducing the costs of inputs and transport, leading to reduced transaction costs. Cluster firms that are nearby also share in the cost of transportation and lead to improved supply chains (World Bank, 2009). Reducing transaction costs enables cluster firms to invest in technology, training, and knowledge

transfer, leading to high outputs and income (Mulanda & Punt, 2021). Furthermore, cost sharing allows cluster firms to buy production inputs in bulk, leading to increased investment in technology and improved performance (The Conversation, 2019).

The cluster benefits firms by employing workers that may be unaffordable for individual firms. A cluster may employ the services of a marketing agent that markets the produce in several markets. The farmers in the cluster benefit from collective marketing, saving them the costs of marketing products. Due to the services of the market agent, farmers focus on improving production, leading to increased income. Part of the income received contributes to infrastructure development in the cluster (IFAD, 2020b).

The farmers of the cluster share input, transportation, and machinery costs. These enable farmers to achieve economies of scale. Collectively, farmers can buy more inputs than if they were to buy individually because of the discounts they receive from manufacturers and increase their level of production and productivity. Wardhana et al. (2017) and FAO (2010) found that cost-sharing increases productivity. Furthermore, the World Bank (2009) and Amuge (2023) argue that cost-sharing enables farmers to access specialized services, personnel, and training, and enhances innovation and productivity. The employment of an administrator to run the affairs of the cluster was made possible by farmers sharing the cost of employment.

The farmers in the cluster share the costs of the procurement and maintenance of the machinery. With machinery, farmers can increase the land under cultivation and improve labor productivity. Wander (2014) finds that this is beneficial for smallholder farmers because outsourcing mechanization services is more expensive.

5.3.6. The location of the company within the cluster contributes to enhanced productivity.

Clustering of the value chain in a single location positively affects firms due to agglomeration. Supporting institutions such as universities, associations, and commodity organizations tend to cluster around firms producing a particular commodity (Porter,

2000). Due to the support of these institutions, cluster firms are relatively competitive, productive, and innovative. The presence of specialized services allows producers to focus on increasing production. More specialized suppliers could also join the cluster due to the spin-off, strengthening the performance of cluster firms (Ketels & Protsivi, 2020).

Farmers in the study are in an area capable of producing potatoes throughout the year, attracting actors in the potato value chain. The area is endowed with natural resources that support agriculture. These natural resources include favorable weather conditions and access to water and land. These resources enabled the production of potatoes on a scale and attracted the Mozambicans and PEPSICO. The presence of the market attracted other institutions such as Land Bank, Kgodiso Financial Services, and Potato SA which offered farmer loans, training, and mentoring services.

The findings support Porter's (2000) findings that local institutions are attracted to clusters and are responsible for transferring information and developing new technologies. Potato SA was attracted to the area and introduced new cultivars, farming practices, and mentors. This brought knowledge and skills to the area, enhancing the farmers' productivity. The findings by Ellison and Glaesen (1999) support the study findings that firms choose a location endowed with natural resources (land, climate, water, electricity), giving them a comparative advantage. The area attracted people who were knowledgeable about potato production. The market was also attracted to the area due to the availability of produce throughout the year. USAID (2014) has found that farmers who produce large quantities regularly attract the market due to increasing global commodity prices and the expansion of domestic and export markets.

5.3.7. The importance of government support in financing and supporting the cluster.

The government should provide infrastructure, knowledge, and skills transfer to support the cluster. The transfer of knowledge in the cluster helps to improve the competitiveness of cluster firms and the reduction. To support the cluster, the government should also establish marketing links to help the cluster market its produce. The government should

assist in providing the cluster with marketing infrastructure (Sartica, 2017). Through institutions tasked with entrepreneurial development, the government can support the cluster with research and development, as well as financial, technological, information and physical resources, to improve the productivity of individual firms (Baily & Montalbano, 2018).). Furthermore, the government can help clusters with physical infrastructure to hold training workshops for the sharing of information (Tambunan, 2024).

In the cluster, the Extension Specialists arrange and train farmers on a range of subjects. The government also organizes information days where experienced farmers share information in the cluster. The government also facilitates the training of farmers through commodity organizations and colleges that offer short courses. Additionally, the government is building infrastructure such as water reservoirs, irrigation systems, and drilling wells. Through the mechanization program, the government supports farmers with tractors and implements and production inputs such as herbicides and pesticides, fertilizer and seed (DALRRD, 2022). Ozo et al. (2007) reckon that the provision of production inputs, machinery, and infrastructure is necessary for increased productivity.

Furthermore, the government declared the area a Potato belt, leading to the value chain becoming active in the area. Porter (2000) found that the government that incentivizes the participation of the private sector leads to a successful cluster due to improved skills technology and productivity. Furthermore, the observation of FAO (2010) is that governments are not good at managing clusters, but should leverage the expertise and resources of the private sector to implement cluster development policies. However, by having information days, the government promotes dialogue within the cluster by having the Specialists, Suppliers, and Farmers exchange information. Göksidan et al. (2012) reckon that the government creates a conducive environment for the growth of the cluster, and Moise et al. (2019) found the improvement of managerial skills and sustainability because of the equipment of the farmers with skills by the private sector. Nel-Saunders & Thomas (2022) observe that creating a conducive environment promotes an environment conducive to entrepreneurial development and social cohesion.

5.4. Recommendations

From the study findings, these recommendations are meant to establish a strong group that enables farmers to develop and achieve economies of scale.

Table 5.1: Presentation of the main findings and recommendations.

Main Findings	Implications for Further Research
Strong relationships of companies within the cluster.	Create an environment conducive to the creation of solid relationships.
Transfer of knowledge from one member to the other in a thriving cluster	Implementation of training programs for cluster farmers.
Cluster members should have an entrepreneurial spirit for prosperity.	Promote vocational training and business incubation.
Institutional support plays an enormous role in the success of the cluster.	Taking membership in a commodity organization.
Cost-sharing practices and payment of fees	Coordinated procurement of production inputs and marketing of agricultural products.
The location of the cluster firm	Selection of a location which provides a comparative advantage
Government support in financing and supporting the cluster.	Development of policies, provision of finance, technical skills, and infrastructure.

5.4.1. Create an environment conducive to creating solid relationships

Farmers in a cluster should have open communication channels. Farmers must work in a coordinated manner when undertaking their farming activities. Establish study groups to allow farmers to learn from each other. This will help to establish solid relationships because the study group will allow open communication between farmers.

Coordinate farming activities to ensure staggered production. This will enable farmers to learn from each other and, in the process, be open to communication among farmers, leading to the formation of trust. In addition, taking exposure trips together will cultivate friendships that enhance community trust.

5.4.2. Implementation of training programs for cluster farmers

Creating a conducive environment for farmers to learn from each other will foster knowledge sharing. Farm field schools can be organized so that farmers learn from each other. Knowledge can also be transferred by organizing farmer's days, where different suppliers share knowledge with farmers. The participation of universities and commodity organizations in the cluster will also help transfer knowledge and skills.

The sharing of labor is another strategy that can be used to transfer knowledge. Farmers should also take advantage of government programs such as the graduate placement program to gain more knowledge about their craft. Mentorship programs are also good channels for knowledge transfer within the cluster.

5.4.3. Promote vocational training and business incubation.

The participation of further education institutions in the cluster is essential to develop training programs for farmers. The program should conduct a skill audit to ensure targeted training. Training should be complemented by networking sessions with established farmers. This will stimulate interest in seeing farmers succeed in their farming operations.

Farmers should have access to finance in the form of soft loans or grants, which will ease the entry of new farmers into the sector and allow new farmers to emerge. New and promising farmers should be enrolled in incubators to improve their skills in agriculture and learn how to navigate the sector.

5.4.4. Taking membership in a commodity organization

Commodity organizations assist their members with a host of services, including financial, technical, and market linkages. Organizations involved in supplier enterprise development provide their members with production inputs and link them to the market. These institutions also provide training programs where members are trained in business management, human resource management, tractor maintenance, and other related courses.

Other organizations also provide incubation and services that improve their members' productivity and ensure their farming enterprises' sustainability. The farmer will benefit by joining such an organization.

5.4.5. Enhance procurement coordination and market linkages for agricultural products.

Farmers should practice coordinated procurement of production inputs. When a group of farmers buys in bulk, they receive discounts from the manufacturer or retailer and save on transportation costs because they will share the transport. Sharing costs results in reduced transactional costs and savings can be used to purchase other inputs or technology related to production for improved productivity.

Group marketing will also help farmers save money because they will share the transportation of products and achieve economies of scale. Achieving economies-of-scale will ensure the cluster's market competitiveness, and farmers will reap the rewards.

5.4.6. Selection of a location that provides a comparative advantage

The location of the farm within the cluster should give the farmer a comparative advantage in terms of climate, suppliers, market, and proximity to other farmers. By choosing a suitable location for the type of crop produced, the farmer will save money and ensure the success of his farming operation. It will be very advantageous for the farmer if the

farm is located in an area where the value chain actors are. This will ensure a seamless flow of information that exposes the farmer to new technology.

Proximity to other farmers will ensure knowledge spillover as the mobility of workers will ensure the transfer of information from one farm to the other. Additionally, proximity to other farms will ensure that the farmer has access to machinery and equipment from other farmers within the cluster.

5.4.7. Development of policies, provision of finance, technical skills, and infrastructure.

The government can support the cluster by creating an environment conducive to conducting business. This includes the provision of infrastructure such as dams, irrigation systems, and boreholes. The support of farmers through the provision of mechanization units will also assist farmers in becoming productive.

The government should also provide extension services to empower farmers with information. Part of the knowledge transfer will also include training programs arranged with sector specialists and universities to demonstrate the technologies that improve production.

The government can also provide farmers with production inputs and machinery within the applicable policies. However, the government must develop an exit strategy that discourages dependency syndrome.

5.5 Implication to the agricultural policies and theories

Cluster development approach can provide huge benefits for both local firms and the regional economy (Barkely and Henry, 2001). It is better than firm-level support because it is more efficient and supports competition (Porter, 2009). The cluster development approach in a given locality of potential growth should be implemented within the existing policies and strategies. In Special Economic Zones (SEZ) the government should

consider a cluster development approach for different commodities adaptable to the area in concurrence with the business sector. Sectorial specialization of different regions is important to ensure targeted support to commodities that have a competitive edge (Andriushchenko et al., 2020; Polozhentseva & Klevtsova, 2015).

Developing a strong cluster depends on the government creating a conducive environment by providing finance, training of workers and providing technological and infrastructural support (Polozhentseva & Klevtsova, 2015). Through its Local Economic Development programmes, the government should identify the unique attributes of the area, availability of infrastructure and proximity to the input and output markets. Targeted industries should receive the requisite support to ensure success (Barkley & Henry, 2002). Clusters thrive in conducive business atmosphere where the government identifies market imperfections that affect clustering and corrective actions are taken (Wolman & Hincapie, 2014).

In creating a conducive environment that supports clustering, the government should build market linkages with international markets, provide access to finance, skills development and infrastructure. The government should support local demand, streamline policies and strategies, and opening-up to foreign investment and competition (Ketels & Memedovic, 2008). In addition, the government should involve the financial institutions (FI) in the cluster. This enables the FIs to empower the cluster companies with the process of loan applications, and increase the cluster borrowing skills (Wadhvani Foundation, 2022).

5.6 Future research

In a cluster, there is collaboration between the government, research institutions and other supportive organizations. The success of the cluster depends on the organizations actively engaging in setting and pursuing the cluster's development agenda (Lindqvist et al., 2003). However, government-established clusters often turn to be unsuccessful (Ketels & Memedovic, 2008). A key research question is: at what stage should

government get involved in the establishment of a cluster, and when should it exit? Moreover, one of the success factors of cluster development is the phenomenon of spillover and agglomeration (Porter, 2009). In the context of a virtual world, do companies still benefit from the spillover effect? Finally, this research focused on the potato cluster in Blouberg area. Would similar studies on other commodities or in different areas yield comparable results?

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APPENDIX

APPENDIX A: Study questionnaire

1. Tell me your story of becoming a farmer.
2. When and why did you shift towards potato production?
3. When did you join the potato cluster and why
4. How did joining a potato cluster benefit you and your community?
5. Current challenges and how they could be solved?
6. How has the cluster development approach affected the local economy?

APPENDIX B: Ethical clearance approval letter



2023-0438_GHREC
Amendment Approve

APPENDIX C: Professional language editing letter



Language editing
Certificate-Peter Ram



Language editing
letter-08-01-2025-Mr

APPENDIX D: Other documents