



Small-scale farming - constraints defining the sector

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Abstract

It has been widely promulgated that for economic development to be sustainable, South Africa will need to shift their perspective towards an entrepreneurial growth model within the small-scale farming sector. Entrepreneurship within this sector needs to be sustained through efficient and effective means that will ensure these 'ecopreneurs' implement their visions for a sustainable future.

Regarding the small-scale farming sector, the development of sustained entrepreneurship is significantly hindered by numerous constraints. This study will investigate how the lack of resources, sector constraints and supply chain inefficiency impact small-scale farmers in South Africa.

Making use of business model innovation as the base theory for this study to investigate the sectors complexity and the direct impact in improving the efficiency and effectiveness of production and the supply chain.

A qualitative exploratory study was used. This ensured the researcher was able to capture the experiences of the selected purposive sample within the small-scale farming sector. The sample consisted of a minimum of 12 respondents or when saturation was achieved with no new constraints being identified.

The findings derived from the study identify that the lack of resources, contextual constraints and an inefficient supply chain prevent small-scale farmers from deriving the benefits associated to business model innovation.

The research was limited based on the initial aspect associated to that of qualitative grounding. This method excludes a quantifiable element of verifiability of responses. The research process is subjective which carries a high risk of personal biases. The benefit of such research, it provides an alternate view to entrepreneurial theory that currently exists within the small-scale farming sector. This will ensure current and future small-scale farmers can develop their current business model using the business model canvas as the defining model to enhance the efficiency and effectiveness of their operations.

Keywords

Small-scale farming supply chains, efficiency, effectiveness, business model innovation, small-scale farmers, technology, authenticity, flexibility

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Chapter 1: Introduction

1.1 Definition and Problem Statement

With the population increasing its need for food, food production must increase in order to meet this demand whilst ensuring the impact to the environment is minimal (Gille, Andersson, Corbeels, Kirkegaard, Mortensen, Erenstein, Vanlauwe, 2015). South Africa's current state of affairs pertaining to the agriculture sector comprises of two categories, subsistence farmers (small-scale) located in the homeland areas and large-scale commercial (white) farmers (Kirsten & Van Zyl, 1998).

Commercial farmers within the agriculture sector dominate the supply of products to local and international markets. This is achieved through leveraging economies of scale in production, trading, marketing and storage (Collier & Dercon, 2014). In direct contrast, small-scale (subsistence) farmers display a significant weakness in this entire process. A breakdown exists between that of the producers and the product market (Collier & Dercon, 2014).

The world today has seen a significant increase in demand for food. Elferink and Schierhorn (2016) have identified that the demand for food will increase in the region of 59% to 98% by 2050 (Elferink & Schierhorn, 2016). This increase in demand can be attributed to several incidents such as high-income growth in low-income countries (Von Braun, 2007) as well as the shift in rural-urban populations through increased spending and consumer preference (Satterthwaite, McGranahan & Tacoli, 2010).

For this context to make sense, an understanding of the macro-economic landscape of South Africa in terms of agricultural production needs to be understood. With agriculture being one of the key sectors which contribute to the country's Gross Domestic Product (GDP), this sector directly or indirectly impacts 8.5 million people pertaining to employment and income (General manager, n.d.).

The number of commercial farmers has decreased from 60 000 in 1996 to 40 000 by 2007 (Vink & Van Rooyen, 2009). It is also noted that 20% of commercial farmers contribute 80% of South Africa's total food production. Low margins obtained by farmers due to high transaction costs during sale (Pingali, Khwaja, Meijer, 2005). Commercial farmers due to the significant size of the organization can benefit from economies of scale. These businesses can afford to run lean due to the ability of purchasing the latest technologies, which allows for economies of scale to be achieved.

South Africa has an abundance of agricultural land owned by commercial, subsistence, small-scale and family farmers. The land accounts for 81% relative to the total area (General manager, n.d.). In terms of the agricultural land in South Africa, approximately 83% is used

for grazing while 17% will be cultivated to produce cash crops (General manager, n.d.). The sector, relatively small in terms of GDP contribution (2.2%), plays a more significant role pertaining to the economy of the country. The formal part of the sector ensures employment of about 930 000 farm workers (General manager, n.d.).

Agriculture markets will need to undergo accelerated change in order to meet the spike in demand (Elferink & Schierhorn, 2016). To ensure that sustainable economic development is achieved and widely accepted, South Africa will have to focus on shifting its development to that of a sustained and efficient entrepreneurship model for small-scale farmers.

South Africa must align with flexible organizational models that will eliminate the dependency on one prescribed mode of production (Collier & Dercon, 2014). A detailed consensus has demonstrated the need for sustainable intensification in agriculture (Giller et al., 2015).

Globally, small-scale agricultural production proves to be significantly efficient in terms of operational activities. Linking this back to South Africa, a disconnect exists through the lack of technology as well as market functionality, with reference to direct inputs, credit facilities and output sale (Collier & Dercon, 2014).

The informal business environment (small-scale farm production), entrepreneurship in this context is drastically affected by numerous structural constraints (Kirsten & Van Zyl, 1998).

This study will look to investigate how the lack of resources, contextual constraints, an inefficient supply chain, land redistribution and the lack of flexibility small-scale farmers are faced with within South Africa.

During periods of famine, resource scarcity will promote an individual's competitive orientation to make decisions that will enhance their own welfare (Roux, Goldsmith, Bonezzi, 2015). This process has been classified as an act of selfishness. Scarcity as a phenomenon has a ubiquitous nature (Roux, Goldsmith, Bonezzi, 2015), affecting one's behaviour through the decision-making process where individuals either benefit themselves or make a trade-off to benefit others. Linking this to prior findings, it has been observed that resource scarcity can increase the generosity from one individual to the next (Roux, Goldsmith, Bonezzi, 2015). Having limited access to resources in a defined sector has shown individuals to be more helpful through sharing of information and generosity associated to items of a material nature (Roux, Goldsmith, Bonezzi, 2015).

Forums are run by industry experts within the small-scale sector to assist farmers with their current constraints pertaining to crop growth, extension services, study groups, information days, technical committees, extension workshops, distribution of cutting-edge information, facilitate holding of Citrus Research Institution (CRI) Symposium, Citrus Growers Association (CGA) Summit and road shows. Stipulated services are provided to ensure that small-scale farmers achieve the required yields to enhance sustainable farm development (A. Mbedzi, personal communication, November 5, 2019). The value-added services are documented in Figure 1.1

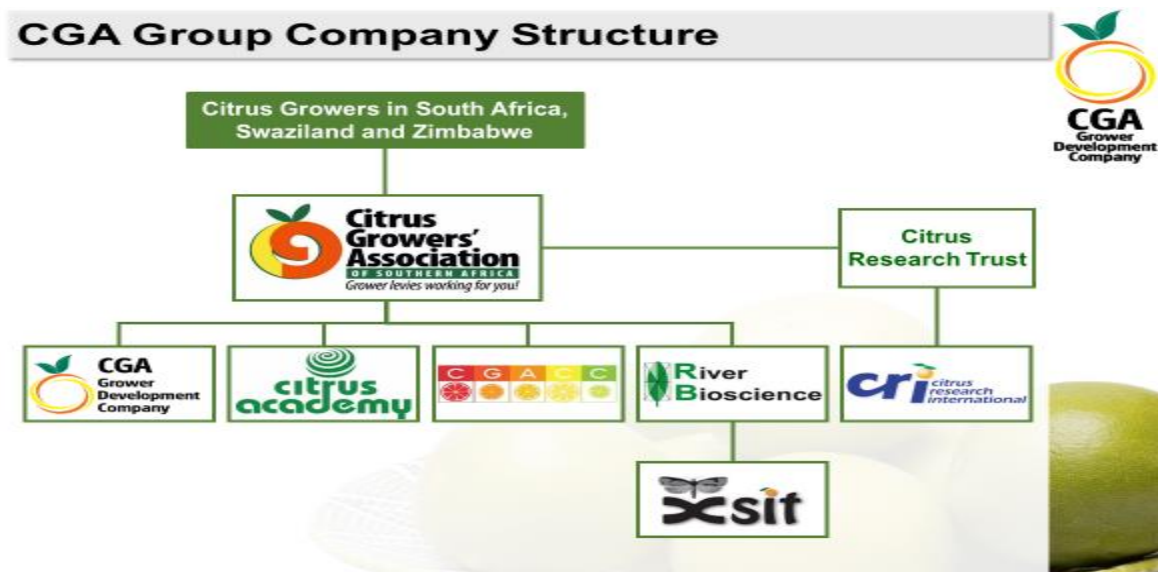


Figure 1: CGA Group Company Structure

In identifying that small-scale farmers face a significant uphill in association to the lack of resources, the dependency on these resources constitutes a contextual constraint. Resource dependency ultimately explains the behaviour of the organization within its current climate. (Nienhüser, 2008). The behaviour of an organization will be influenced by external as well as internal bodies who control sector related critical resources (Nienhüser, 2008).

This will include the decisions being made as well as the non-decision. Associated decisions are derived from management differences relating to the direction of the organization to remain stable as well as sustainable to achieve long-term profit generation (Nienhüser, 2008). Controlling key industry sector critical resources demonstrates power, with power this elicits a predefined type of behaviour within the organization as well as the sector.

A. Mbedzi (personal communication, November 5, 2019) commented that to define this power gap, a comparison can be drawn between that of commercial farmers and small-scale farmers.

Commercial farmers control the distribution of produce to export and local markets while small-scale farmers will have to consolidate production, make use of a commercial farmers “pack house” in order to meet industry standards for export (A. Mbedzi, personal communication, November 5, 2019).

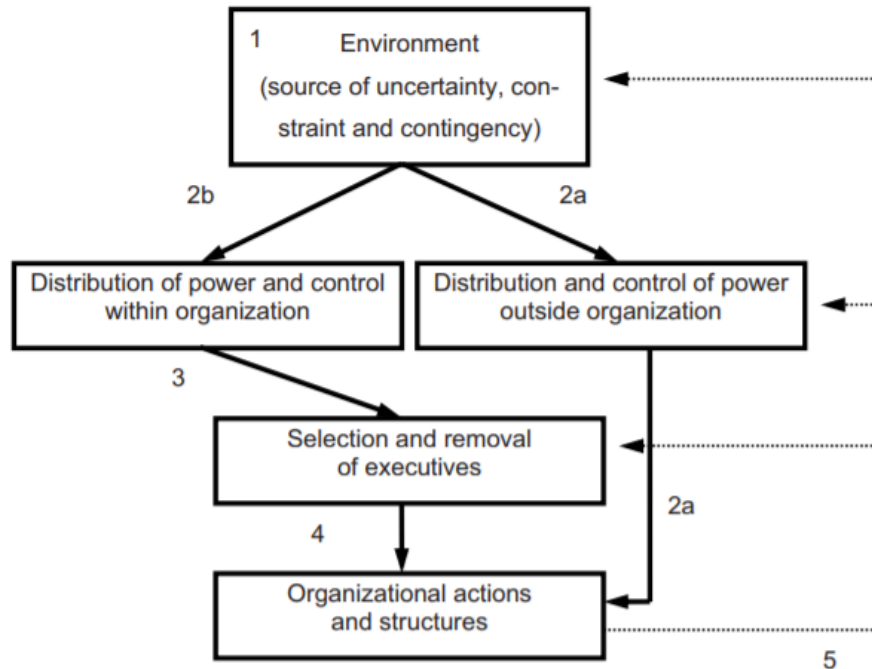


Figure 2: The connection between environment, organization and organizational decisions or actions (Nienhüser, 2008, p. 4).

In understanding these decisions, developing countries have altered production preferences of farmers and consumers through virtue in creating new modern market (Slamet, Nakayasu, Ichikawa, 2017). With the creation of new markets, opportunity is created for small-scale farmers to supply new channels. With opportunity identified, small-scale farmers are now faced with new constraints in terms of quality, consistency, stipulated packaging and safety of produce (Slamet, Nakayasu, Ichikawa, 2017).

An additional constraint to the new opportunity for small-scale farmers supplying new modern markets is that of inefficient supply chains. The corresponding issue that are identified for small-scale farmers would be a fragmented supply chain, linkage and integration, infrastructure, technology, farmers knowledge, quality, safety, processing, financial, transportation, post-harvest losses, information and packaging (Negi, Anand, 2015). To ensure adequate delivery of production items, small-scale farmers require infrastructure that can assist in terms of on-time delivery while items remain in the same condition when the

contract is negotiated (Negi, Anand, 2015). Having the correct infrastructure, this will ensure a reduction in the high losses of production items from time of harvesting to final sale.

Infrastructure issues	Variables	Source	Strategies
Infrastructure Facilities	Lack of storage / Warehouse condition in the village areas.	Jain, 2007; Shulda, 2010; Kapoor, 2009;	Semi Processing Unit can be set up by Govt. agencies/entrepreneur nearer to agriculture produce area. Small size food parks can be developed at various center points of districts areas with the facilities of packaging, semi processing, grading, better equipments for loading and unloading and machinery for value addition in F&V.
	Poor Loading/ unloading facilities in the farm and Mandi place.	Satyanarayana et al, 2007; FICCI, 2010;	
	Lack of Processing facilities (Waxing, washing).	Viswanadham, 2007; GOI, 2012;	
	Lack of Packaging facilities.	Bhardwaj and Palaparthi, 2008;	
	Hilly terrain and poor road connectivity.	Veena et al, 2011;	
	Poor transportation infrastructure (Road, Rail etc.).	Halder and Pati, 2011; KPMG & ASSOCHAM, 2009;	
	Infrastructure connecting the farm is very poor.	Dharni & Sharma, 2008; Singh et al, 2009; Narula, 2011;	
	Inadequate Marketing infrastructure such as grading, standardization and other machinery near the farm region and at Mandi place.	Sharma & Singh, 2011	

Figure 3: Compiled infrastructural issues in supply chain of F&V in India and their corresponding mitigation strategies (Negi, Anand, 2015, p. 9).

South Africa is currently undergoing a land reform process in terms of redistribution, where the current distribution of land indicates a drastic high unequal allocation that coexists with deep rural poverty (Lahiff and Cousins, 2005). The similarity with respect to the above is that of Zimbabwe's agriculture resettlement programme. South Africa is undertaking the same process but expecting a different result.

Land reform has been earmarked as the potential vessel to unlock growth and employment-creation in the agriculture sector (General manager, n.d.). The National Development Plan (NDP) has based land reform on several principles. These principles look at: the transfer of agricultural land back to black beneficiaries without an impact on the agri-business sector, sustainable production to continue transferred land using incubators, mentoring and apprenticeships and institutions that will monitor and protect land markets from opportunism, corruption and speculation (General manager, n.d.).

In order to ensure that the redistribution process provides economic development, a model should be developed to remove the negative connotation associated with small-scale production, thus linked with non-productive and non-commercial agriculture (Kirsten & Van Zyl, 1998).

Mafra, Ferreira & Oliveira (2008) have indicated that consumers today are more aware in terms of food compositions and what the labels state. Thus, the link between food compositions in terms of authenticity could become the value proposition for small scale farmers to enter the market in terms of supplying locally and export markets. This expedited process requires flexibility within the developments of small-scale farmers being able to pivot based on the changing demands of the new modern markets.

Volberda (1996) defines flexibility in terms of the degree to which organizations will have access to the variety of managerial and speed elements with which can be incorporated to enhance control (Volberda, 1996). De Leeuw and Volberda (1995) argue the term flexibility within an organization will be used as a magic word or that it belongs to a new business fad. In relation to flexibility, deemed an important aspect needed by every organization and what makes an organization flexible (De Leeuw and Volberda, 1995). Organizations today strive to continuously meet the ever-evolving change in consumer demand while still trying to ensure profit will be made within the competitive landscape of the business environment.

As defined by Taneja, Ligteringen, walker (2012), stability over the last decade has been replaced with the growing uncertainty within the competitive business environment. The increased uncertainty can be attributed to factors such as globalization, liberalization and technology. The enhanced access to information and communication technology has influenced not only local business sectors but sectors within the periphery we assume are not competitors (Taneja, Ligteringen, Walker, 2012).

As globalization is one of the key drivers in relation to economic growth as well as activity integration, organizations will need to ensure their capacity will be able to outlast the steady incline in demand locally as well as internationally. Goetz (2014) states that, 'globalization will create the initial disconnect to bring about change within the competitive landscape'. This will give rise to the emergence of markets not located in the organizations geographic centre where expertise has ensured market dominance (Goetz, 2014). In enhancing the degree of flexibility within an organization will either yield significant competitive advantage or reduce the current control (stability) within current operations. Thus, the trade-off exists for small-scale farmers between that of flexibility through innovation or ensuring continuous stability within the current operational environment (Volberda, 1997).

The research will look to identify the constraints faced by small-scale farmers within the agricultural sector. This will also encompass the associated current land reform and redistribution process occurring in South Africa. It will identify direct constraints pertaining to

lack of resources, contextual constraints, inefficient supply chain in reaching local as well export markets and the impact of flexibility. The value driver could be food authenticity as the value proposition to ensure economic development of the land transpires. Commercial farmers will endure significant land loss through the redistribution process. The research questions explored will be based on 4 dimensions: 1.What is native to the geographical location in terms of food demand (production module procedure)? , 2.What expertise will be needed by the owner to ensure products are produced (training and on-boarding)? , 3.What rules and regulations exist currently that dictate supply to local markets as well as that of export markets? , 4. The exposure to the relevant platforms which connects buyers and sellers of stipulated products. The propositions for this research will be conceptualized around: 1. lack of critical resources for small-scale producers, 2. contextual constraints for growth and development, 3. inefficient supply chains that hinder the sector to promote long-term sustainability and 4. flexibility as a key driver of small-scale farmers to increase production within the agriculture sector.

The question raised now is to ensure that the land which will be redistributed remains sustainable for the family who own it as well as ensure continues employment for the individuals who rely on the agricultural sector for income and employment. Ensuring continued focus is given to small-scale farmers; this will be the key to growth and reduction in poverty (Collier & Dercon, 2014).

1.2 Significance of the Research

1.2.1 Business Requirement

Small-scale farmers and new farmers through land redistribution are dependent on supply chains to distribute their produce. An understanding pertaining to these entrepreneurs will need to be obtained in terms of the decision process and production dynamics. Obtained results can identify if formal business structures exist which can contribute to business model innovation. Enhancing the current supply chain's efficiency to deliver significantly more value to the producer and consumer compared to that of the current supply chain used by commercial farmers. Applying the correct business model and structure, then leveraging it through business model innovation will ensure that supply chains in the small-scale farming sector exhibit sustainable projections. This will ensure the ecosystem becomes profitable for both producer and consumer.

1.2.2 Theoretical Contribution

Within the commercial farmer's network, the traditional supply chain encompasses a multitude of role players such as suppliers, traders, vendors and service providers. With all participants relying on one another to form an efficient ecosystem that will provide value to be purchased/used by the end consumer (Adner, 2016). This formal division of the agricultural supply chain sector displays significant evidence of innovative design and business models being developed (Achtenhagen, Melin & Naldi, 2013). This has developed to ensure sustained value creation through a balanced use of resources, exploiting new business opportunities and developing coherence amongst all leaders (Achtenhagen, Melin & Naldi, 2013). This division has consistently adapted, renewed its business model to ensure that value is captured for both the producers as well as the end consumer. As stated in theory, listening to customers enables firms to become more market orientated. Firms who are market orientated tend to report superior results in innovation, learning and adaption, market share and profitability (Reed, Goolsby & Johnston, 2016).

With this literature focused more to that of the formal context and widely recognized in developed countries, it does not cater for the South African ecosystem. Limited literature associated too small-scale farmers in relation to defined business model innovation and supply chain management exists. As this market is significantly small in relation to the South African economy, it yields significant growth opportunities which can contribute to the economic stability in years to come. This research offers a unique opportunity to understand the contextual constraints with regards to this environment, then developing a unique product offering delivered through authenticity and develop a business model unique to this informal sector which can be replicated for all small-scale producers globally.

1.2.3 Purpose of the Research

The purpose is to gain an understanding associated to the complexities experienced by small-scale farmers and the contextual constraints they encounter within their supply chains to obtain market share. Understanding what business models are used, if any and providing this informal sector with business innovation to ensure sustainable value creation for future generations.

1.3 Conclusion

This chapter has provided sector background for the study and highlighted significant contextual constraints pertaining to small-scale farmers. The insights garnered demonstrate

why the study is necessary in relation to a theoretical perspective as well as that of business. In determining that business model innovation exists within the supply chain of small-scale farmers, efficiency can be achieved for all stakeholders that will ultimately improve the developing business environment for these entrepreneurs.

The literature review to follow will link to the research objectives defines while making use of resource constrains and supply chain theory as the overarching directive. A further review on literature will unpack flexibility, contextual constraints, business model innovation as well how entrepreneurs define their brand and create effectuation within the sector.

Chapter 2: Literature Review

2.1 Introduction

Significant research has been done around food authentication. Danezis, Tsagkaris, Camin, Brusic & Georgiou (2016) define food authentication in terms of the label description following that of the commodity produced. This considers the origin, production method as well as processing technologies. Commodities associated with specific quality which are deemed to be 'valuable' can attract or become the target of fraudulent activities (food crime) (Danezis, Tsagkaris, Camin, Brusic & Georgiou, 2016).

The second element which is covered is that of proof of food provenance. This ensures that food safety requirements are met as well as ensuring that the consumer is protected (Danezis et al, 2016). The third element is compliance which covers all national legislation, international standards as well as the guidelines (Danezis et al, 2016). The methods of authentication stem from the point of origin due to the globalization of food markets today (Danezis et al, 2016). The literature review will explore associated literature pertaining to entrepreneurship theories by leveraging brand authenticity, effectuation, business model innovation and supply chain theory.

2.2 Entrepreneurship Theory

Entrepreneurship theory today can be seen through its development from its infant form to now including numerous view points from multiple fields. The theory is developed in the formulation of relationships, underlying principles which look at explaining entrepreneurship as well as predicting the activity (Kurarko, Morris & Schindehutte, 2015).

To provide context, entrepreneurship today does not account for its own conceptual framework (Shane & Venkataraman, 2000), it's interdisciplinary (Kurarko, Morris & Schindehutte, 2015). The concept has not been labelled in terms of being a differentiating domain but rather a broad label where numerous researches can be stored. Entrepreneurship has taken on the form only to be associated to small or new business, while only focusing on the elements of discovery and exploitation pertaining to profitable opportunities only (Shane & Venkataraman, 2000).

Shane and Venkataraman (2000) distil that the development of their framework will ensure entrepreneurship is seen as an opportunity to provide individuals with direction regardless of the industry and current life-span of the business.

With entrepreneurial theory been marred by numerous views within the literature, the use of common-sense logic ensured that these views were broken down to specifically understand entrepreneur opportunities (Ramoglou & Tsang, 2017). Opportunity is constructed through own development arising at different intervals that will demand greater commitment from the entrepreneur. Thus, opportunities do exist which need to be creatively realised (Ramoglou & Tsang, 2017).

Entrepreneurs today are deemed integral cogs in the renewal process of modern economies. Entrepreneurs will drive their opportunity through entrepreneurial actions by making use of effectuation (Sarasvathy, 2001). An effectuator is seen as an individual who will seize an opportunity to fulfil current and future aspirations (Sarasvathy, 2001). With developing economies, entrepreneurs will demonstrate bricolage within a resource constrained environment (Linna, 2013). This will efficiency with regards to the current resources they have available at hand.

With the current study being conducted in a resource scarce environment, an additional view in terms of entrepreneurship theory looks at the perspective of a resource-based view. Entrepreneurs exhibit resources that are specific to them which facilitates the identification of new opportunities while ensuring that correct resources are gathered for embarking on the new venture (Alvarez & Busenitz, 2001).

To maintain the sustained competitive advantage entrepreneurs exhibit, personal heterogeneity needs to be preserved (Alvarez & Busenitz, 2001). This element links extensively with brand authenticity pertaining to the cognitive belief of the entrepreneur.

Brière, Tremblay and Daou (2014) commented that due to South Africa being a developing market, the focus must be placed on entrepreneurship and business development. This will grow the country's economy (Brière, Tremblay & Daou, 2014). In contrast, Herrington and Kew (2014) argue that South Africa has is classified as one of the leading African countries to suffer inequality, regardless of the significant investment made in entrepreneurial activity (Herrington & Kew, 2014).

2.3 Brand Authenticity

Brand authenticity as defined by Akbar & Wymer (2017) is where the brand is delivered to be unique, legitimate, and truthful too claims and lacks falsity (Akbar & Wymer, 2017).

Authenticity is an integral part of business processes when developing a product for consumers (Mohart, Malar, Guevremont, Girardin & Grohmann, 2015). The nature of the product pertaining to its authenticity must be significantly communicated to the direct consumers thus affecting their behaviour.

The product (objective) should be seen to encompass a measurable quality that can be tested and evaluated by experts (Mohart et al, 2015). Lu, Gursoy and Lu (2015) stipulate that the consumer's perception of authenticity becomes a critical factor in terms of brand equity. Brand equity thus becomes a determining variable in terms of the consumer's choice of brand (Lu, Gursoy & Lu, 2015).

Moulard, Raggio and Folse (2016) raise a different perspective in terms of brand authenticity. They identify the relationship between that of the consumer's perceived belief in that the brand's manager is intrinsically motivated through passion in delivering a product they are devoted to (Moulard, Raggio & Folse, 2016). This construct identifies elements associated too self-determination theory and attribution theory (Moulard et al, 2016).

Self-determination theory can be linked to that of human motivation and personality (Ryan & Deci, 2000). It links the importance to continuously evolve one's inner resource through personality development and self-regulation of behaviour (Ryan & Deci, 2000). In terms of attribution theory, this depicts causality as a perception (Weiner, 1972). This is based on the fundamentals that responsibility will drive a behaviour (Weiner, 1972).

The interests of the producer through his expertise will ensure that marketing decisions are determined solely through set personal standards and not what the market dictates is appropriate.

In developing bandy authenticity, objectives such as rare brand behaviour and stable brand behaviour need to be exhibited beforehand. In terms of the 'rare brand behaviour', the identification of uniqueness and scarcity relating to the product must be displayed for customer's attention (Moulard et al, 2016). To sustain the brand reputation, longevity and consistency pertaining to 'stable brand behaviour' should highlight the key characteristics (Moulard et al, 2016). These objectives need to be delivered solely from the producer's perspective to enhance the brand.

The demise of brand authenticity is where the organization focuses its orientation to be customer oriented. This can be deemed to be inauthentic as the brand is driven by individuals who solely focus on external development, commercial audiences and maximization of profits (Moulard et al, 2016).

Brand authenticity based on the above can be a culmination of both elements, where the consumer derives value from the product through a change in behaviour as well as the producer through his experience and passion delivers a product that the consumer believes in based on the behaviour of the set individual. The authentic association is to ensure devotion from an internal perspective that is evident for consumers to observe.

2.4 Effectuation Theory

Documented in terms of being a grounding theory that provides insight into the construct known as entrepreneurship. Established through the premise that the entrepreneur leverages his effectuator skill set that drives entrepreneurial action in relation to the opportunity identified (Sarasvathy, 2001). This principle leverages affects to realise an opportunity. In realization of the theory, trust within the entrepreneurship environment provided significant discourse in terms of behaviour (Sarasvathy & Drew, 2008). It is understood that commitment from business supply chain partners will invoke a rationale of trusting behaviour. This commitment will ensure identified opportunities the realization in terms of fruition (Sarasvathy & Drew, 2008).

In terms of understanding effectuation theory in today's context, behavioural elements associated to the entrepreneur with regards to his creativity and actions which are informed from his past will be connected to his effectual process (Read, Sarasvathy, Dew & Wiltbank, 2016). With this process defined, understanding variation per context will need to be investigated. In understanding this evolution, conducting tests associated to the South African context of small-scale producers might yield a unique understanding in terms of the current shortfalls and the structural constraints.

2.5 Business Model

Foss and Saebi (2017) stipulate that business model innovation (BMI) addresses an important phenomenon but lacks theoretical underpinning from a business perspective. With business models (BM) not being detailed as an important factor to consider in the makeup of a business within this context, one does exist through the combination of resources. As organizations operate in an open system where turbulence, risk and uncertainty are predominant, business models ensure organizational stability while accommodating flexibility to achieve defined efficacy rates (Carayannis, Sindakis & Walter, 2015).

With strategy playing a significant role in business today, business models define the core and are drivers of strategy (Carayannis, Sindakis & Walter, 2015). Business models are key to ensuring strategy is understood effectively and communicated within an organization to its greater ecosystem.

The strategic choices and their operating implications are reflected by a business model which helps to communicate, analyse, test and validate the cause and effect relationships that come from these strategic choices (Carayannis, Sindakis & Walter, 2015). According to Foss and Saebi (2017) business model innovation (BMI) addresses an important phenomenon but lacks theoretical underpinning from a business prospective. With business models (BM) not being detailed as an important factor to consider in the makeup of a business within this context, one does exist through the combination of resources. As organization operate in an open system where turbulence, risk and uncertainty are predominant, business models ensure organizational stability while accommodating flexibility to achieve defined efficacy rates (Carayannis, Sindakis & Walter, 2015).

With strategy playing a significant role in business today, business models define the core and are drivers of strategy (Carayannis, Sindakis & Walter, 2015). Business models are key to ensuring strategy is understood effectively and communicated within an organization to its greater ecosystem.

Teece (2010) stipulates that business models need to ensure they provide business with a platform from which value can be derived for the customer. This value derived needs to translate in bottom line profit for the organization (Teece, 2010).

It is anticipated that using numerous business models, organisations will obtain a competitive advantage in terms of flexibility, remaining current and innovative. Organizations employing numerous business models concurrently are deemed to have higher successful innovation compared to those who operate one (Carayannis et al, 2015).

In relation to the core perspectives of business model innovation, research focuses on three objectives, 1. the theoretical foundations of the resource-based view of the organization, 2. the dynamic capabilities view of the organization and 3. the strategic entrepreneurship view (Carayannis et al, 2015).

2.5.1 Business Model Innovation

Sustainability concerns such as financial crises, economic and social inequalities, material resource scarcity, energy demands, and technological development are all issues that

organizations are expected to consider with more intent. While these challenges might be viewed as an increase in risk, it can in fact be an opportunity for organizations to entertain innovation that are sustainability orientated. Eco-efficient and eco-effective innovations that will help improve and conserve social, financial and natural resources within the core business of an organization is what will lead to success (Joyce & Paquin, 2016).

The motivation of how an organization creates, delivers and captures value defines a business model. There are three aspects of the conceptualization of an organization that is worth mentioning: 1. The integration of key components and functions in order to deliver value to the customer. 2. The interconnection of those parts within the organisation and throughout the supply chain and stakeholder networks. 3. The role these interconnections play within an organization's process to generate value and create profit. Strategic competitiveness of an organization is supported by a business model that provides insight into the alignment of high-level strategies and underlying actions (Joyce & Paquin, 2016).

Organizations need to have the ability to innovate within the domain of sustainability. It doesn't matter whether this is done in small incremental steps or by radical disruptive innovations, but this capability to innovate is a necessity for any organization. Business model innovation is the route for integrating sustainability into an organization (Evans, Vladimirova, Holgado, et al, 2017).

Small scale farmers can innovate their business model by considering their current challenges as opportunities to evolve and identifying ways to innovate.

- sharing and renting equipment such as tractors instead of buying
- Having cash crops on the side while harvests of main product is low
- Exploring vertical farming and using that specifically for cash crops
- Selling direct to local markets
- Using technology to simplify tasks for faster production

Teece (2010), Zott and Amit (2010), Beneke, Curran, Forsyth & Lamb (2011) and Adner (2016) stipulate that these contextual constraints and challenges are located with the informal economy, all highlighting where current supply chains are described as being inefficient and there is a lack of business model innovation.

In understanding the associated specific contextual constraints of the small-scale farmers, the need to understand their mental models based on behavioural decision-making process when

engaging with the world around them (Vuillot, Coron, Calatayud, Sirami, Mathevet & Gibon, 2016).

It is evident that only a select few small-scale farmers engage in business model innovation (BMI). This innovation has not created an extended competitive advantage through true value creation (Wirtz & Daiser, 2017).

In understanding BMI, Wirtz and Daiser (2017) provided a conceptual framework which provides explanation as to the key elements and dimensions that BMI should encompass. This allows for conceptualizations of how the framework demonstrates the supply implications for business owners (Wirtz & Daiser, 2017).

2.6 Resource Based View

Organizations can achieve a sustainable competitive advantage by leveraging their internal resources. This process ensures that competitors and external market forces will not negatively impact the current organizational performance (Campbell & Park, 2017). Sustained competitive advantage is obtained when the organization ensures four distinct attributes exist, 1. valuable, 2. rare, 3. imperfectly imitable, and 4. hard to substitute (Campbell & Park, 2017).

The firm's resources providing a competitive advantage are defined as the primary drivers of performance. In contrast to the above, Barney, Wright, Ketchen (2001), distinguishes that the current resource-based view exhibits elements of maturity. This development in the resource-based view is yet to adequately consider the factors associated to small-scale producers in terms of leveraging resources (Campbell & Park, 2017).

Campbell and Park (2017) have noted a shift within this theory to encompass small-scale business regardless of context. This is ensured by making use of factors such as entrepreneurship and social capital to be the antecedent drivers of performance. Through customer orientation (brand authenticity), competitive advantage was driven regardless of resource base (Campbell & Park, 2017).

An interesting contrast to antecedent drivers providing the beneficial performance, Prashantham and Dhanraj (2010), Yil-Renko, Autio and Tontti (2002) argue that the stipulated divide between quantity and quality of resources available to an entrepreneur, this will ensure a derived competitive advantage.

This shared resource-based view promotes inclusion of both sectors while challenging the views in terms of the dynamics associated to formal and informal sectors within a developing economy (Srivastava, 2006).

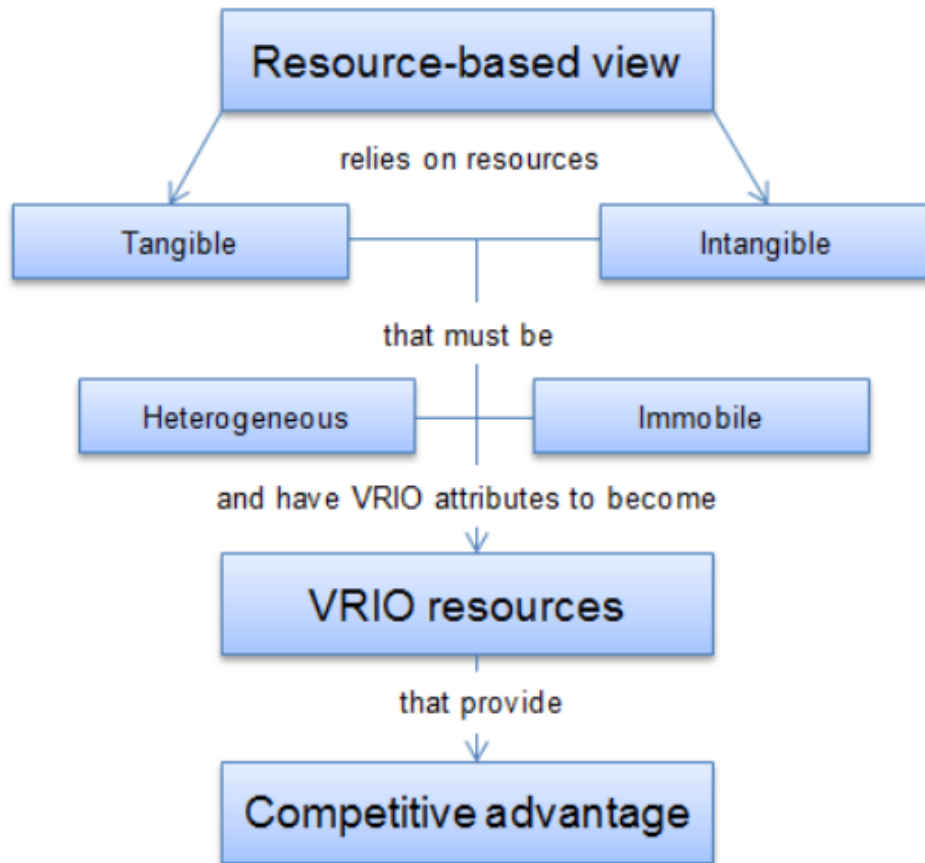


Figure 4: Resource-based view

2.6.1 Resource Scarcity Theory

Literature affirms that scarcity is at the core of economics (Lemley, 2019). When one's own appropriation is restricted by scarcity there is a reason to help others. The resource scarcity theory is based on supply and demand of goods. When commodities are in abundance, the value will decrease and the inverse for when commodities are scarce. Scarcity promotes value (Lemley, (2019). Without scarcity, welfare of others won't be affected by taking out one's own resources as needed (Pfaff, Vélez, Ramos, Molina. 2015). Within the context of small-scale farming scarcity of a renewable resource like water is a reason for environmental conflict. Scarcity of water would influence production and supply of commodities. When faced with a unique challenge one could either adopt a new approach or use an existing method in an innovative way (Mehta,& Zhu, 2015).

Tietenberg & Lewis (2016) comment that in terms of efficient allocation of resources this will not lead to the sustainable criterion being achieved.

The resource ultimately is the most critical resource for the organization today and in the future (Mancosu, Snyder, Kyriakakis & Spano, 2015). The availability and accessibility of water has been marked as a significant factor which can constrain the development of crop production (Mancosu, Snyder, Kyriakakis, Spano, 2015). The detrimental consequence associated to this process in terms of water scarcity during a drought period will create significant competition between that of the agricultural businesses who contribute to the economy as well other sectors within the economy who rely on water for production (manufacturing) (Mancosu, Snyder, Kyriakakis, Spano, 2015).

With the lack of resources initially within the small-scale farming sector, trying to acquire resources during the second stage will be significantly more difficult (Keupp & Gassman, 2013). This process thus creates radical innovation as a result.

Small scale farmers experience scarcity of resources on a much bigger scale. They are solely responsible and liable for their produce from start to finish. So, when there is water scarcity and water prices increase it affects the entire operation. This may in turn affect harvest and quantity of produce.

2.6.2 Resource Dependency Theory

In analysing the small-scale farmers based on a resource-based view, it helped ascertain which certain resources were critical to ensure venture success (Sequeira, Gibbs & Juma, 2016).

In mitigating the demand on resources, little work has been done to understand the specific resources used in relation to current small-scale farmers supply chain (Matopoulos, Barros, & Van der Vorst, 2015).

This theory is explained as transactions between organisations within their environment to acquire resources. Organisational theory and strategic management were mainly influenced by the resource dependence theory (Hillman, Withers & Collins, 2009). Theoretically, power and influence will originate due to resource dependence and external constraints (Prasad, Zakaria, & Altay, 2018). Organisations' embeddedness in a network of relationships is a result of resource dependence. Three factors determine the level of dependency: The importance of

the resource and to what extent it is needed to produce the end products. Secondly, supplier sustainability and the costs involved to switching to alternative supplier options. Lastly the ownership of the resource as determined by its responsibility (Kalaitzi, Matopoulos, Bourlakis & Tate, 2018).

The behaviour of organisations is shaped by the dependency of key resources in the environment. Organisations are motivated to reduce interdependency when there is a scarcity of resources in order to gain control over the scarce resource. By reducing dependence on a single environmental source and increasing the bond with existing environmental actors through constraint absorption, a dependent organisation facilitates a mutual dependence to prove dominance within an environment (Coupet & McWilliams, 2017). Environmental actors however often choose to rather exploit power imbalances that result from external dependencies, yet governments would often use resource dependence as a power to influence the operations of organizations. The main objective being so that organisations depend on government resources (Coupet & McWilliams, 2017).

Small scale farmers can network and operate interdependently. This can be done by renting equipment to save costs on investing large sums of money that can be used for other necessary expenses. Sharing of a borehole for water, providing support in terms of knowledge and assistance with complicated challenges that can be overcome together. Some small sale farmers would like to enter the export market but can't produce enough to fill the quota required. In this case small scale farmers can team up to collectively fill a container and get their produce out internationally.

2.7 Supply Chain Theory

Supply chains have been conceptualized as networks where no organization will operate in isolation from competitors (Carter, Rogers & Choi, 2015). The development of supply chains has moved beyond the generalist buyer-supplier relationship to now incorporating the smallest operational unit.

Supply chains consist of numerous nodes relevant to the stipulated context. Within this context, the network adapts to become a self-organizing system (Carter, Rogers & Choi, 2015). This complex adaptive system per node becomes an agency where control over resources and

accountability in operating is measured to ensure the section is profitable (Carter, Rogers & Choi, 2015).

In its simplest explanation, a supply chain is every participant in an industry that contribute to fulfil a customer's demand or request (Syntetos, Babai, Boylan et al, 2016). Each participant can be an entire organisation or a unit within an organisation, but essentially forms part of the decision-making units to deliver the final product to the customer. The flow of each supply chain system consists of products & materials and money & information. The entire supply chain is set in motion by the final customer's demand. (Syntetos, Babai, Boylan et al, 2016). Supply chains have been conceptualised as networks where no organisation will operate in isolation from competitors (Carter, Rogers & Choi, 2015). The development of supply chains has moved beyond the generalist buyer-supplier relationship to now incorporating the smallest operational unit.

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Every supply chain strives to maximise the overall value generated. The value is the difference between what the product is worth to the customer and the cost that was incurred by the supply chain in fulfilling the customer request. Supply chain forecasting plays a major role in the overall value and helps with uncertainties associated with the demand. (Syntetos, Babai, Boylan et al, 2016). When supply chains are longer, there are more organisations involved and the coordination of them becomes more complex. Customer demands are not constant or known with certainty in advance and therefore forecasting is not a straightforward scheduling task. Supply chain management is challenged when operations struggle to run smoothly due to all these uncertainties. Each supply chain's forecasting frequency would vary depending on the organisations and the decision-making processes they serve (Syntetos, Babai, Boylan et al, 2016).

Supply chains are full of uncertainty. Some uncertainties like inconsistencies in quality or delivery dates originates under a supply chain member's own roof. Other external sources of uncertainties are for example the variability in the timing and quality of incoming materials or even the quantities that customers demand. A member within the supply chain can also face an uncertainty if they are not receiving the correct information at any point within the line of

supply, including lack of information from suppliers and customers. The lack of information would constrain this member to perform optimally within their required responsibilities (Flynn, Koufteros & Lu, 2016). Uncertainty is a multilevel phenomenon that exist at organisational, functional, group and individual levels. Social expectations, behavioural response repertoire, perceptions and physical manifestations are four sources of uncertainty that come into play within a supply chain (Flynn, Koufteros & Lu, 2016).

Small scale farmers are very dependent on their supply chain. In some cases, they don't have their own pack houses on the farm and are therefore dependent on a third party. Uncertainty within the supply chain for small scale farmers

2.7.1 Formal Supply Chains

It has been derived from literature outside of this sector that elements associated to formal supply chains encompass strong strategic alliances where supply chain management and information modelling allow for innovation to emerge which will manage defined complexities throughout the duration of the organization (Lönngren, Rosenkranz & Kolbe, 2010; Segerstedt & Olofsson, 2010; Papadonikolaki, Verbraeck & Wamelink, 2017). In analysing the results from this sector, it is evident that the supply chains associated to small-scale farmers constitute as being one that is simple and traditional. This broader supply chain concept aligns with the views of Petersen, Charman & Kroll (2018).

2.7.2 Informal Supply Chains

Informal small-scale farming supply chains within emerging economies provide their own complexities. These complex systems are made up of nodes that are unique to the specific context or sector (Khan & Kazim, 2008). The most identifiable difference between that of the formal sector supply chain and the informal sector supply chain is that the latter is significantly constrained by a lack of resources. This constraint significantly impedes the efficiency of the entire operation.

In ascertaining that informal supply chains are impacted directly by a lack of resources, the directive would be to move to a supply chain with a vast net of suppliers, professionals and service providers (Adner, 2016). This process will ensure the development of an ecosystem which will yield significant value add for all stakeholders.

Guo, Zhang, & Gao (2018) and Kickul, Griffiths, Bacq, & Garud (2018) argue against this form of radical innovation for business of small-scale farmers within this informal sector to create sustainability

2.8 Flexibility

Volberda (1997) indicates the literature associated to strategic management leans more to that of stability not change. With the environment experiencing change continuously, it is far too risky to rely on the conventional strategic management approaches (Volberda, 1997). The concept of organizational flexibility was developed to enhance the offering of strategic management. Providing organizations with an alternative strategic element within their strategy (Volberda, 1997).

Organizational flexibility can be regarded as an element that enhances the control function within an operation to ensure stability reinforces the desired strategy implemented. Volberda (1996) states that for total flexibility to be achieved within the organization, it will need to retain a sense of identity and continuity (Volberda, 1996). To reduce the effect of chaos in any organization, stability in the element of flexibility provides this solution (Volberda, 1996). There is significant evidence in literature which Volberda and other authors echo; for organizations to effectively maintain control, it will be necessary that stability is preserved and the identity of it must be maintained (Volberda, 1996).

Volberda (1996) claims that flexibility provides an advantageous element to any organization only when reinforced with the element of stability. Steady-state flexibility encompasses procedures of a static nature that will enhance the optimization in relation to performance levels of increased throughput when current throughput remains consistent over time (Volberda, 1996). Organization's reaction time to external elements within the environment due to change will be relatively slow. Instability within organizations results from a lack of or excess in flexibility. Flexibility provides synergy between that of rigidity and overreaction (Volberda, 1996).

A firm will be in control when management can account for the corresponding change within the competitive environment. Research has indicated that organizational flexibility cannot operate in isolation, there needs to be a substantial form of control that will elude to stability. An organization not responding to environmental change by imposing control process of stability. There is limited research conducted in relation to this aspect.

The research will look to disprove the formulation that flexibility operates in conjunction with stability, that stability and control produce efficiencies (cost, resource allocation and risk reduction) within the organizational operations department. Flexibility in isolation will allow organizations the ability to adapt to uncertainty within their direct environment which requires reactions to be quick in order not to lose the advantage they have developed in performance (Verdú-Jover, Lloréns-Montes & García-Morales, 2005).

Verdu-Jover, Llorebs-Montes & Garcia-Morales (2005) argue that organizations fail in the initial step of innovation (change management) due to the inflexible as well as rigid vision of themselves. The perception derived in terms of the relationship with their environment is perceived incorrectly. Innovative organizations consistently look to review their current offerings and image. This is achieved by continuously trying to ensure the correct relationship in association with the environment is developed and maintained to maintain the competitive advantage developed (Verdú-Jover, Lloréns-Montes & García-Morales, 2005). An identifiable void exists within the current innovative models, these models do not consider constructs associated with the construct of flexibility.

Research based theory suggests that significant insight be given to complex sets of organizational resources to understand how flexibility can result in developing the competitive advantage (Wernefelt, 1984). As many organizations rely solely on control and structure within the operation to achieve the required competitive advantage, this has a limiting influence on their ability to be agile. With significant influence placed on these factors, the organization's ability to respond to environmental uncertainty is severely hampered.

Abbott and Banerji (2003) indicate that with increased volatility within the external environment, the organization will need to ensure greater flexibility that will permit them to respond to the emerging conditions immediately. Abbott and Banerji (2003) detail flexibility as several "senses" which include; "adaptability, agility, corrigibility, elasticity, hedging, liquidity, malleability, plasticity, resilience, robustness, and versatility". As organizations will indefinitely showcase any of these flexibilities due to pressures applied by the external environment associated to uncertainty.

Literature has indicated that flexibility is solely associated with that of being an adaptive response (Abbott & Banjeri, 2003). This response is demonstrated in environments which depict a higher degree of uncertainty. Organizations will respond to mitigate the degree of uncertainty by applying strategic flexibility to proactively re-define market uncertainties and make it the cornerstone of its ability to compete (Abbott & Banjeri, 2003).

In order to ascertain the relevance of stability within any organization, it is vital to determine if elements such as strategic flexibility, flexibility and innovation do not influence the degree of control when instability arises within the external environment. Ensuring that the control and stability processes implemented and promulgated by senior management within the organization are enough to withstand the pressures of change in their direct environment.

With growth being regarded as one of the key elements in organizations, there needs to be an efficiency in the flexibility which allows for the capabilities of the organization to explore new ventures and manage the environment change. Managing the external pressures will be pivotal to ensuring long-term sustainability. This model ensures management has the required skills to develop the capabilities that will enhance flexibility as well as ensure the firm has an adequate organizational design to utilize the capabilities (Volberda, 1996).

For the balance to coincide, organizations need to ensure the developing capabilities and current conditions work jointly together to enhance development. A disruption in this balance, efforts of flexibility will not be achieved resulting in the advantage within the environment unrealized (Volberda, 1996).⁷ With turbulence been linked as one of the defining factors in environments today, there is an identifiable dependency between that of the sufficiency of the flexibility mix and the adequacy of the organizational conditions.

Volberda (1996) states that the more dynamic (frequency and intensity of the environmental changes), complex (number and relatedness of environmental changes), and unpredictable the environment (extent to which cause-effect relationships are incomplete), the more difficult it is to handle the managerial and organization design tasks (Volberda, 1992)

2.9 Conclusion

In this chapter, a review has been provided of literature to garner insights associated to entrepreneurship theory, supply chain theory and the business model innovations available for the small-scale farming sector.

The theoretic bases for this study will encompass the resource-based view, business model innovation and supply chain theory. These overarching principals will be used to understand the constraints faced by small-scale farmers within the agricultural sector. The concept of flexibility will be looked at as a constraint disabler.

Chapter 3: Research Questions

3.1 Introduction

In understanding what drives small-scale farmers to continue to be entrepreneurs, their reactions/flexibility to situations where resources are scarce in terms of production schedules, how contextual constraints define the behavioural decision-making process and the effect of this on the supply to the broader business environment will be potential topics which will be explored.

These contextual constraints will allow for business model innovation in terms of understanding the current sector issues in association to small-scale farmers within South Africa.

The primary research questions detailed below will guide the study in terms of identifying the relevance of contextual constraints within the small-scale farming sector. This will be explored further by three sub questions.

3.2 Primary Research Question

How do resource/contextual constraints impede the level of operational efficiency within the small-scale farming sector of South Africa?

By making use of resource dependency theory and resource scarcity theory as a point of departure for this framework. The primary research questions aim is to identify and determine the constraints associated to small-scale farmers which encompasses how efficient/inefficient the current supply chains of this sector are.

The question looks to confirm the sector contextual constraints as well as the impact of resource constraints on business model innovation. Do these constraints have a significant impact on current flexibility with regards to the supply chain. As small-scale farmers are classified as entrepreneurs, do the current contextual constraints enhance the bricolage of these farmers as a collective to accelerate business model innovation within their sector.

In addition to the primary research question identifying the contextual constraints of the sector with respect to supply chain efficiency, it will look to garner further information on how small-scale farmers embrace business model innovation within their organization. Will business

model innovation be a consideration within the supply chain when conducting business locally and for export markets within the agriculture sector. In the event innovation within this sector was identified, the innovation will be documented to understand the defined uniqueness of the solution and the scalability of this business model innovation for emerging small-scale farmers.

3.2.1 Research Sub-Question 1

What are the most significant components that affect small-scale farming operations?

This question will look to identify the differences in identifiable components of small-scale farmers with that of industry experts. Do the components identified by small-scale farmers differ significantly from that of the industry expert? In understanding the business models, what significant difference can be identified within these two contrasting sector contributors. Is there a disconnect between industry experts and small-scale farmers in terms of critical components?

3.2.2 Research Sub-Question 2

What are the constraints within the small-scale farming sector that will affect business innovation and business model innovation?

The aim of sub-question two will look to highlight the constraints within the current business models' small-scale farmers make use of and what impact it has on business innovation. How these constraints impact the efficiency of the current operation with respect to future developments for sustainable development.

Chapter 4: Research Methodology

4.1 Introduction

Chapter 3 highlights the defined research questions that will be investigated in this research report. Determining these propositions will provide focus in terms of the drivers pertaining to the contextual constraints faced by small-scale farmers within South Africa. This chapter will provide clarity in terms of the methodology used to explore the research questions outlined. Making use of a multiple case study approach, enabled by semi-structured interviews-it will allow for in-depth data to be collected from the predefined sample of small-scale farmers and industry experts within Gauteng.

The respondents comprised of farmers and experts which allowed for triangulation of the data within the study. As the topic has seen a fair amount of investigation, a qualitative exploratory approach was used to understand the contextual specific constraints as well as discover any unique innovations within the supply chain of small-scale farmers.

The below headings will provide more detail as to how the research questions stipulated in Chapter 3 will be unpacked and answered.

4.2 Research Design

In developing the research methodology, it is imperative to understand the purpose of the study. Research experts such as Malhotra (1999), Tharenou, Donohue and Cooper (2007) and Saunders and Lewis (2018) emanate this thought process, that it is key to formulate the correct research design for the purpose of the study.

In defining the philosophy to be used, Saunders and Lewis (2018) define this as the system of beliefs and assumptions associated to the development and nature of the knowledge base. Being the researcher, I will assess the defined target section based on the nature of reality, ontological assumptions (Saunders & Lewis, 2018).

The philosophy defined will be that of the interpretivism mindset. Saunders and Lewis (2018) define this as the study of social phenomena in their natural environment. In relation to the selected population, small-scale farmers, an understanding of the current contextual constraints faced by these individuals in daily operational functioning of the business. Looking at the process of how these actors facilitate their roles in ensuring sustainability of the business while meeting the direct goal of being profitable.

The approach applied will be based on the development of current theory. This process will be formulated through an induction of current data gathered (Saunders & Lewis, 2018). The data will be analysed to understand explanations which arise. Linking these observations to why value is placed in the process of functionality. Qualitative research will ensure the researcher the opportunity to encompass and understand any new findings within the specific situations (Golafshani, 2003), where the issue/innovation will reveal itself naturally in the research findings (Patton, 2002).

This process ensures that specific observations within the functionality of daily operational procedures will be generalized. A close understanding of the defined process. Providing the foundation for future small-scale farmers to not pay the same “school fees” during the development phase as well as develop current theory (Saunders & Lewis, 2018). Saunders, Lewis and Thornhill (2009) commented that while a study is under induction, the data should be followed and not vice versa in relation to deduction approaches. Deduction comprises of a rigid methodology which does not allow for explanations that differ when analysing the data gathered (Saunders et al., 2009).

A qualitative approach will be used for this study. Due to the highly unique and complex environment small-scale farmers co-exist in, the data collected through a quantitative approach will allow for new concepts to be identified. The qualitative approach for research is deemed more preferential when the researcher makes use of the current context to garner more insight on new concepts raised by the selected sample (Leedy & Ormrod, 2002).

The research will make use of a mono method approach. The process is facilitated by face-to-face semi-structured interviews. Due to the complex situation of the sector, adequate exploration is needed in the identification of concepts not known. Exploratory research as defined by Saunders, Lewis and Thornhill (2009), is discovering new concepts/themes by asking different questions in association to the current phenomenon. This will establish a new perspective on the current situation, thus understanding the topic more clearly which is under investigation (Saunders & Lewis, 2018). Exploratory research generates answers based on questions posed from the researcher, but the research will require more investigation around the topic using a quantitative study which will validate the findings.

The research question will be addressed based on a pragmatic view. A pragmatic view implies a philosophy that stipulates the most important objective of the research design adopted is that of the research questions (Saunders & Lewis, 2012). The aim is to offer a practical

solution. The subject is appealing to the researcher, which will allow for practical value to be drawn from the research. Qualitative research will allow for new findings to be extracted from the specific context.

An explorative research design will be used as the researcher lacks understanding on all elements associated to the topic (Saunders & Lewis, 2018). Malhotra (1999) endorses this process to ascertain a deeper understanding of the researched context. This process gives rise to enhancing theory development within a jurisdiction that currently has limited research (Saunders & Lewis, 2012).

The flexibility of the approach within the interview will allow for additional elements to be discovered in terms of the stakeholder's perspective (Saunders & Lewis, 2012). The formulation of causal relationships between key variables will be critical in discovering new issues. Due to biased information supplied, this data will not be suitable for that of the explanatory and descriptive methods.

The data collection process will be facilitated by a cross-sectional study. This process provides a 'snapshot' of the context at one point in time (Saunders & Lewis, 2018).

4.3 Sampling Method and Size

According to Saunders and Lewis (2018), when you do not have a complete list of the population, it is advised that one makes use of non-probability sampling. Purposive sampling is used when the researcher deliberately chooses the participants based on qualities they display (Etikan, Musa & Alkassim, 2016). A method which does not require underlying theories.

This research will make use of non-probability, purposive sampling procedure. The mixed method will ensure that more than one triangulation will ensure as well as enhanced the validity of the data collected. In relation to the criterion sampling, this will ensure that stakeholders from the respective geographical location are similar in criterion which will ensure the discovery of trends being evident or not from the data. The mixed method ensures communication with all levels of the supply chain members associated to the agriculture sector. With this process, it will allow triangulation of data which will deliver the significant thick and richness required for the authentication of the research (Saunders & Lewis, 2012).

The method will look directly to that of the micro-level theory of the individual, what behavioural elements are visible in terms of interactions between the respective individuals directly connected with their immediate supply chain (Saunders & Lewis, 2012).

With respect to the sample size, initially will follow the elements associated to that of the Phenomenology research design. Having a minimum of 12 respondents per geographical location or until saturation is reached where no new data about the phenomenon is heard. Interviews will continue until saturation is obtained when the rate of new codes created decline based on the analysis per interview (Saunders & Lewis, 2012).

The population defined within this research will encompass two stakeholders involved in the agricultural supply chain; that being of the small-scale farmer and the industry expert within this agricultural sector. Associated stakeholders in terms of the land redistribution will be that of the government and new land owners. The data from the above respondents will be gathered from geographical locations in Gauteng.

4.4 Measurement Instrument

With respect to the measurement instruments used, this will encompass three items to ensure validity and reliability when processing the data post collection. The first will look at that of the semi-structured interviews (Saunders & Lewis, 2012). This element is seen as the primary stage of data collection through the face-to-face engagement between that of the interviewer and selected respondent. The recordings as well as transcripts will provide factual accuracy of the prolonged engagements of the interview.

This will enhance the reliability of the research as each interaction will be documented in terms of time, date and observations noted. This will ensure an audit trail is generated to ensure validity and reliability of the source does not come into question.

As the audit trail has been created per engagement, this ensures the internal validity has been covered (credibility). In relation to the dependability, the audit trail will provide the building block for this element. As a researcher, triangulation of responses per respective geographic and respondent will enhance the reliability (Saunders & Lewis, 2012).

As the above elements provide credibility in the measurement instrument, the trustworthiness of the data collected ensures that the qualitative research meets the set objectives in terms of adding onto theory and providing generalizability (model which can be implemented by all small-scale agricultural businesses).

Transparency in relation to the research process will ensure the audit trail is credible. This is done by ensuring as stated above that all interaction with respective stakeholders are documented religiously in terms of all data extracted from the interview (Roulston, 2010). The

strategy used will be that of interviews directly with the respective stakeholders within the supply chain. This will allow for trends to be detected based on the responses of all respective parties involved (respondent and environment triangulation). This will ensure the researcher can progressively refine questions asked to determine if trends are prevalent within the industry (build on theory as information comes to light).

4.5 Data Gathering Process

Before the initial interviews can begin, the pre-test pilot interview must be approved. This must be tested amongst a small sample of the determined population to determine if set questions outlined that need to be answered provide accurate data associated to the set overarching question. The pre-test interview was conducted with one commercial farmer who was previously a small-scale farmer. This ensured questions posed would be fully understood by the selected sample. Removing content that would create a misinterpretation due to unfamiliar of the terminology based on the sample originating from the informal business sector. Thus, priority was given to ensure questions were simplified so respondents could understand the relevance of the question being asked.

Semi-structured interview process will be used. This will allow initially for open-ended questions to be asked by the interviewer, who will then ask a range of follow up specific questions to guide the discussion. The process of the interview will be detailed below in terms of engagement (Saunders et al., 2009; Patton, 2002; Welman & Kruger, 2001; Miles & Huberman, 1994):

1. Interviews conducted with each respective respondent (Small-scale Farmer and Industry Expert)
2. The recorder interview and field notes were transcribed
3. Analytical findings from interviews were noted with respect to future interviews to take place
4. Themes were generated from data gathered
5. New themes discovered were recorded for future interviews
6. Above steps were repeated for following interviews

Insight and understanding will be obtained from this approach. This process allows the flow of topics to change as to ensure the respondent provides responses, he/she is confident about. The rigidity associated with structured interviews will not be suitable as the power lies with the

interviewer. This process is reactive and will not allow for additional insights to be gathered from the industry which theory has not covered completely.

Primary interviews will be conducted face-to-face with the respective stakeholders within the set agricultural supply chain.

Additional primary methods that will be used to collect data will be through observations in the Meso-Level. This will highlight interactions of organisations in relation to the buying/selling from the market agent to the buyer within the local/export market. The last will be that of photographic evidence. This will ensure the authenticity of commodities produced per region. This becomes the audit trail in relation to what variety was planted, when and what the quality of the commodity will be defined as. This ensures that miss-management of quality produced is not replaced by inferior products.

In terms of secondary data collection, this will be done through document review based on information supplied currently. This can be collected from the source (Global GAP Regulation Body) in terms of what process was followed prior to authenticity regulations and policies were put in place for any sale of commodity to consumers (consumer protection act).

A cross-sectioned time horizon will be made use of. This is due to the limited time dimension as well as the information gathered from respondents to determine outcomes based at the specific point in time (Saunders & Lewis, 2012). A longitudinal approach is not viable as respondents within the sector will have limited time periods for engagement due to the stringent demand the current operation encompasses. This will rule out a baseline assessment being obtained.

4.6 Analysis Approach

Collection of data from multiple sites is seen as challenging as well as rewarding (Namey, Guest, Thairu & Johnson, 2008). Data analysis is the collection and organization of data based on order, structure and meaning (Lal, 2001). Namey, Guest, Thairu and Johnson (2008) have defined that due to numerous theoretical developments this has benefited the qualitative research. In terms of analysis, the category used will be thematic. This type of analysis is substantially more involved and nuanced (Namey et al, 2008). This analysis is more detailed than content.

Data analysis was used during the below two stages (Srnska & Koeszegi, 2007):

1. *Unitisation*: Determining the unit of analysis from the transcripts and then dividing the data into themes and patterns.
2. *Categorisation*: Identifying patterns and themes from the onset of the interviews. Linking this directly to the research question.

Content analyses focuses on the frequency and saliency of particular words extracted from the original data in order to identify keywords or ideas in repetition (Namey et al, 2008). This system of analyses ensures efficiency and reliability of data but has significant constraints which will influence the richness of the data produced (Namey et al, 2008).

Thematic analysis will be used as it moves past the counting of explicit words/phrases to incorporate the identification as well as description of implicit/explicit ideas (Namey et al, 2008).

During the interview process, on completion of each interview the recording was transcribed. ATLAS.ti was used as the data analysis and coding tool. This allowed for the data to be organised into information segments which now become meaningful. This process will ensure codes are developed per idea and theme which will then be applied to the data to determine summary markers for when analysis of the unitisation phase occurs (Namey et al, 2008).

Once these codes are developed per idea/theme, this can be applied to the respective data collected from the geographical locations to determine if a comparison exists in co-occurrence or graphically displaying code relationships (Namey et al, 2008). This analysis focuses on the reliability which raises a concern, the researcher must interpret the data collected for codes to be allocated; interpretation may vary across analyses (Namey et al, 2008).

This form of analyses is data driver which holds similarity in terms of theory-driven as well as data-driven. Ideas guide, or hypotheses identify what the researcher is looking to assess (Namey et al, 2008).

Following the theory-driven approach will ensure that structure is given to the research which results in an increase in the reliability of the data (Namey et al, 2008).

Incorporating the data-driven approach, this will ensure that flexibility of the analysis is prevalent which will take into the discovery of new themes or ideas to which was not originally previously mentioned (Namey et al, 2008). This approach ensures greater validity.

For this study, the purpose is to gain insight into the small-scale farming sector and what contextual constraints exist for these entrepreneurs. Garner understanding in association to the business models used, innovation within the business model and the direct supply chain

elements. Authenticity will be used as the value-added construct to obtain market share. The unit of analysis will be that of the small-scale farmers and the respective industry experts within this sector. The interaction will be observed between the respective entities associated linked to production (small-scale farmers), intermediary (Industry expert) and the respective buying entities.

4.7 Limitations

As the specific context plays a significant importance, the data gathered needs to be analysed in-depth. This will ensure the importance of the quality of data gathered more important than the quantity for findings to be transferred.

In terms of limitations, the initial aspect would be that of qualitative research. This research process is subjective and carries high risk in terms of being affected by numerous biases (Saunders & Lewis, 2012).

Bloomberg and Volpe (2012) and Taran, Boer and Lindgren (2015) comment that when results are generalised, this limits the results obtained during the data analysis process. The contrast defined is that from the larger sample sizes obtained in quantitative analysis versus the richer and smaller sample size in qualitative.

The qualitative process excludes the quantifiable element associated to the verifiability of responses. In addition to the above, further limitations are mentioned below:

- Selected geographical location (Incorporating more geographical locations will yield results in terms of more richness of data to be analysed)
- Time horizon (Use of a cross-sectional approach only facilitates a snap shot of the sector at one point in time)
- Language used for interviews (Not designated first language of respondents, this could result in questions being interpreted incorrect)
- Researcher bias based on elements associated to the agriculture sector. Coming from a small-scale sector, the information I hold will bias me towards gathering data for questions I want answered.
- Respondents acceptance of the interview, however did not provide consent for the interview to be recorded. Field notes taken instead. This limits the data as the field notes may not have been recorded accurately.
- Due to the time constraints of the research, leveraging of relationships at the researcher's disposal in order to obtain data for saturation to be achieved.

4.8 Ethical Considerations

The entire process with regards to the research proposal encompassed ethical considerations. The interview schedule must be passed by the GIB's ethics committee before data could be collected (Appendix D). Respondents were protected through the researcher drawing up consent letters in order to provide them with the directive of the study. This can be seen in Appendix A and Appendix B

Chapter 5: Results and Findings

5.1 Introduction

This chapter will provide a base description of the sample and an associated summary of each of the respective cases as well as providing context from the respective industry experts within the supply chain of small-scale farmers. Each selected respondent within the case will be described before the results are presented. The results and findings will be categorized in relation to the three research questions. The research consists of one main research question that is subsequently followed by two sub-questions.

Resource constraints and supply chain theory cover the main overarching principles to which the results were built on. During the data analysis process, additional themes were identified. This is due to the nature of exploratory research. These themes will be presented in accordance with the respective research question in association with the findings. The results pertaining to each research question will be presented at the beginning of each section. This will be added by a diagram to allow ease of reference. The findings stipulated in the evidence will be found in the results section. This evidence was taken directly from the transcripts of each small-scale farmer case and industry expert case.

5.2 Sample Description

The selected sample of this study was constructed from the small-scale farmers and industry expert cases. All selected cases were drawn from the small-scale farmer agriculture sector within South Africa. All individuals are entrepreneurial founders and were interviewed using semi-structured interviews. All businesses are similar in nature as they are all small-scale farmers initially. The industry experts began as small-scale farmers and now have transitioned into commercial farmers. The respective small-scale farmers differed in terms of location, selected product offering, size of business and the number of years they have been in operation. The selected cases were selected only from the Gauteng and North West region. This comprised of Magaliesberg and Klerksdorp.

Within these regions, small-scale farmers and industry experts were interviewed to obtain an overall insight to the constraints faced by these entrepreneurs within the supply chain. Within each selected region, small-scale farmers (white) and industry experts refused to be

interviewed. They felt the sharing of industry knowledge was obtained through hard work and numerous failures, thus providing them with their current competitive advantage.

From the perspective of the industry expert, a significant different perspective was obtained due individuals being past small-scale entrepreneurs and now are not faced with the daily operation constraints faced by small-scale farmers today. A contrast to the constraints mentioned from past small-scale farmers to the current constraints faced by current small-scale farmers.

The industry experts thus provided not only what business models they made use of as well as an indication of what business models current small-scale farmers need to implement in achieving an efficient supply chain. The above data received will allow for a solid foundation to be achieved when triangulating of data occurs. This triangulation will ensure the findings to be more of an accurate nature.

To ensure ease of reference, each case is labelled A to E, while the industry experts will be labelled: Industry Expert 1A (IE 1A). The below table identifies each respective respondent in relation to the small-scale farm, the small-scale farmer and location within supply chain:

Table 1: Small-scale farming cases

<u>Small-Scale Farmer</u>	<u>Sector</u>
Case A: Bakgat Boerdery	Primary & Secondary production
Case B: Healthy Life for Achievers	Primary production
Case C: Bathlako Temo Services	Primary production & Export
Case D: Elandskraal Farming	Primary production & Informal market
Case E: Green City Farms	Hydroponic production, Primary & Secondary production

Table 2: Industry expert cases

<u>Industry Expert</u>	<u>Sector</u>
IE 1A: Citrus Research Institution	Product & Research Development
IE 2B: Artificial Intelligence Group (AI)	Research, Development & Implementation

5.3 Case Descriptions

5.3.1 Case A: Bakgat Boerdery

This farm was established and inherited from the owner's father grandparents. The farm has been passed down from generation to generation- family business. The owner and her mother run this small-scale farm as a part-time business due to been employed by corporations who have interest in this sector. The farm is used as a base for company X (TrenStar). TrenStar provide quality solutions for the management of returnable rental packaging. The drive is for innovation through collaboration. With the industry requiring specific packaging, the owner identified a shortfall within the current supply chain of farmers.

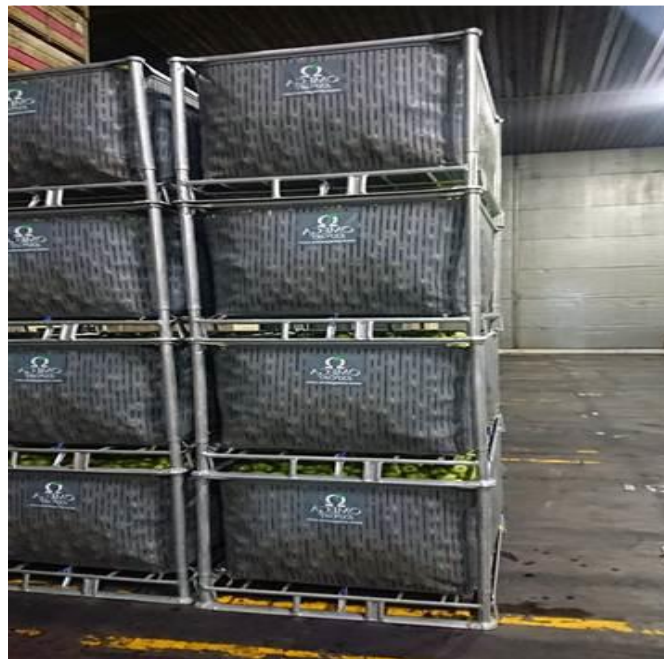


Figure 5: TrenStar Omega Bin-Citrus Agriculture

Farmers paid significantly less for quantity supplied and penalized for produce being damaged. While the farm is actively producing, the scale of the farm is significantly low compared to that of the surrounding farms. Currently the produce is sold to local markets and damaged produce sent to the Magalies Citrus for juicing. The owner has maintained the farm in continuing to produce citrus, while it supplements the development of her on-site nursery.



Figure 6: Bakgat Boerdery Nursery

This was established due to the current shortages of plants within the agriculture sector. A constraint on the system for small-scale farmers who require continued supply of plants in order to maintain sustainable production. Without sustainable production, the small-scale farm is impacted financially.

The business is self-funded through the sale of plants to surrounding small-scale farmers. The income generated from “TrenStar” allows the owner to ensure the maintenance of the farm is continued, to not impact operations. The income generated from sale to local markets and the juicing facility ensures farm related bills are paid. The business currently is made up of the owner and her mom who are part-time employees. The farm employs 20 full-time employees. Each member of the farm carries out specific tasks for the simple operation to run effortlessly. The owners have access to their own transport infrastructure (through inheritance), that facilitates order delivery to clients as well as the juicing facility.

The owner currently manages the business from an elevated role while relying on her mother to ensure the day-to-day operational activities are completed and under control. The owner manages stock control, payments to suppliers, compliance with regulatory institutions and over all monitoring of specific operations. The biggest concern raised is in terms of remaining profitable. With the scale being on the low side, the owner's mother will assist by climbing onto the tractor and completing a time-specific crop spray. Time is of the essence with this regard, missing one spray or being delayed by a few hours can result in the farm losing their entire crop to phytosanitary diseases or the quality being compromised.

The owner stipulates an expansion plan has been drawn up but due to numerous contextual constraints such as land reform, lack of resources and inefficient supply chains; this has impacted the sustainable growth of the farm.

The organization relies on word-of-mouth and direct referrals as its form of marketing. When it comes to market research, the owner contacts buyers who provide insight into market demand for next season consumption (local market). The owner collects market data pertaining to demand for export markets through agents located abroad. In relation to communication with employees, the owner makes use of WhatsApp. This platform allows for business operations to be communicate instantaneously as well as ensures the operations remains efficient.



Figure 7: Bakgat Boerdery

5.3.2 Case B: Healthy Life for Achievers

This small-scale farmer (lady) illustrates a great rags to riches story. The owner grew up on a farm where her parents had worked for several years. The daily engagement with the employees as well as the farm owner developed her passion for this agriculture sector. The owner today now operates and runs a citrus farm located in Magaliesburg. Before beginning her own journey within the sector, the owner spent years post completing matric working on the farm with her parents to garner critical knowledge in relation to farm efficiency, growth and development of the business and sustainable farming. During this period, the owner applied for land through the 'Land Redistribution Program' offered by the government. In October 2015, land was awarded to the owner.

Case B has now been in business for four years. The owner has explained the difficulties surrounding the constraints in running an efficient operation. The initial constraint Case B has with the acquisition of land, is that the government does not give the owner the title deeds for the land. This ultimately places the owner on the back foot when trying to apply for funding.

Financial institution in South Africa will not provide small-scale farmers with loans as they do not own the land. The funding received from the government provides a base for the farm to be cultivated, trees to be purchased and planted and for basic equipment to be purchased. With production taking two years to complete before harvesting can commence, the return on asset generation is delayed. Profit is only seen in year three of which this does not allow for short-term stability.

An additional element surrounding the development of this small-scale farmer is that of continued educational development. The government provides the farmer with an initial on-boarding with respect to operational running of a farm. This support is drastically reduced over time as officials from the government and local municipal are not available when the farmer requires assistance.

In relation to the produce emanating from production, currently one hundred percent of the produce is sent to the local juice mill within Magaliesburg (Magalies Citrus). The owner has indicated that due to limited funding, outdated equipment, current water scarcity constraint within the region and an inefficient operation has resulted in the quality of the produce being below industry regulation for human consumption.

The sale of produce is at a price significantly lower compared to when being sold at local markets. The reduction in margins obtained has impacted the owner in terms of improving the current inefficient supply chain. Currently, the owner is operating on a day-to-day cycle. Waiting on future funding from the government in order to upscale the current operation. Developing the farm will provide new markets to be served locally and internationally.



Figure 8: Healthy Life for Achievers

5.3.3 Case C: Bathlako Temo Services

A small-scale farm that is a family-run co-operative. This co-operative is the leading citrus producer within the North West. The co-operative was founded in 2012 by five members. The land, which is currently leased from the North West Department of Agriculture and Rural Development.

The current land size is 51 hectares. Initially the co-operative chose to produce sunflowers as their main crop for sale. This lasted two years before moving across into the citrus sector. The co-operative, like that of 'Healthy Life for Achievers' was funded by the government. During the period, 2014 to 2017; the co-operative received R 1 600 000.00 million in funding. The co-operative currently employs 10 permanent employees, while also employing over 70 seasonal employees during harvest season. The farm currently has 16 000 citrus trees in production.

The co-operative is the first black-owned citrus producer within the North West that has entered the export market.

Number of Black Growers Per Province			
Province	Enterprises	Citrus Planting	Average Enterprise Size
KwaZulu-Natal	17	1 337ha	79ha
Eastern Cape	36	1 927ha	54ha
Limpopo Province	44	2 385ha	54ha
Mpumalanga	11	749ha	68ha
Gauteng / North-West	5	130ha	26ha
Western Cape	7	216ha	31ha
Northern Cape	3	577ha	192ha
Total	123	7 320ha	



Figure 9: Number of black growers per province—CGA Grower development company

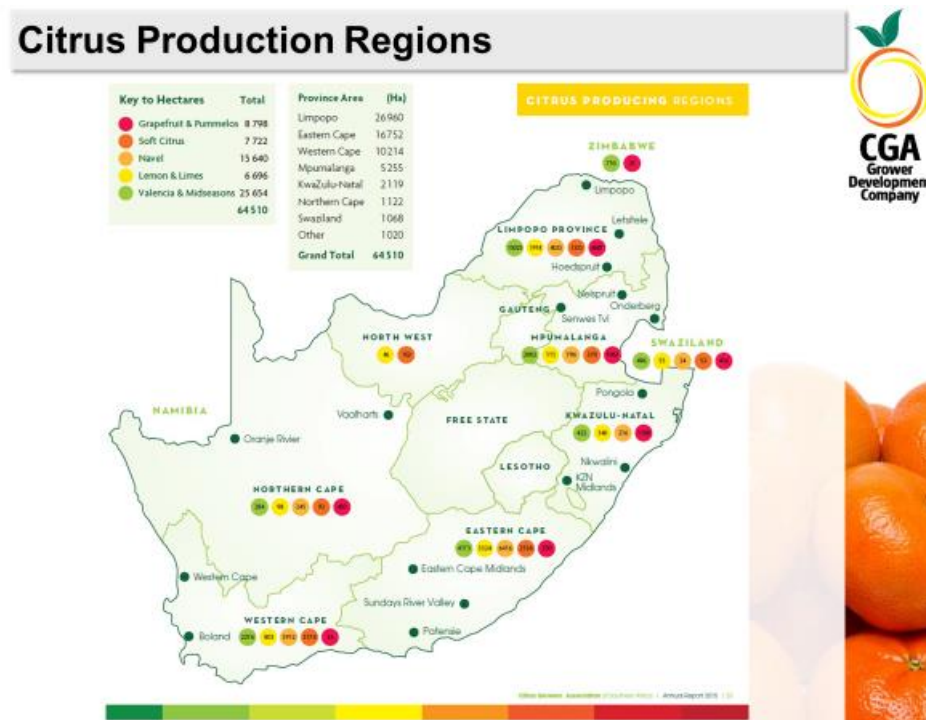


Figure 10: Citrus production regions—CGA Grower development company

The co-operative currently distributes its production to the local as well as export market. In supplying the export market, the produce is destined for the Middle East and Taiwan.

In achieving this standard, the co-operative indicated this feat did not come easily. The funds allocated from the department were used to improve the current irrigation system as well as improve the efficiency within the supply chain. The associated cost of not having your own infrastructure has resulted in the produce being sorted, packed and distributed by local commercial farmers. This constraint that the co-operative faces has resulted in increased costs of production for their produce. The members highlighted these constraints as significant hurdles within their supply chain as they are not able to supply on-time as the current infrastructure isn't able to handle the quantity produced.

The co-operative is currently a member of the Citrus Growers Association (CGA). This establishment ensures the co-operative aligns with global procedures in relation to operational standards of production (pesticides, herbicides, harvest and quality).

CGA Grower Development Company



Mission

To support the establishment and growth of **sustainable** and **profitable** black citrus growers with market linkages to ensure **food security, jobs** and **wealth creation**.

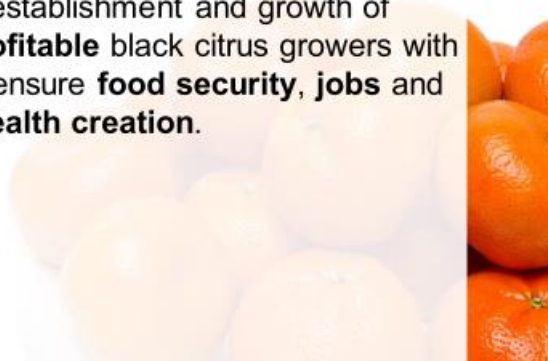


Figure 11: CGA Grower development company-Mission

5.3.4 Case D: Elandskraal Farming

With Case D, this small-scale farmer shares a significant background with that of Case B and Case C. This owner once again is also located in the Magaliesburg area. The current operation was established in 2002, where the owner applied for land from the Department of Agriculture and Rural Development.

The owner, unlike the owners from Case B and Case C did not receive a grant from the department. This entrepreneur has solely funded his business by being able to pivot and gain an advantage through the production process. Case D has supplemented his long-term growth portfolio with that of short-term 'cash-crops'. The owner entered into contract farming, establishing demand driven produce contracts with respective wholesalers who understand fresh produce peaks and troughs within the food industry sector.

With product know, quantity required and time-horizon of supply, Case D can develop and plan accordingly. With the owner understanding the required quantity, this ensures operational timelines can be set in order to meet the stipulated deadline. With quantity demand know, this allows the owner to purchase suppliers for the stipulated account in large quantities. Leveraging economies of scale in order to obtain discounts.

The 'cash-crops' ensure the business has a steady inflow of capital throughout the year. The capital derived from the 'cash-crops' ensures that Case D can continually invest in improving his long-term citrus infrastructure. Case D's directive is to return to supplying export markets where higher margins are realised. The current citrus crops are sold to local markets and Magalies Citrus. In differentiating his customer based, the owner, this year (2019) has begun to sell produce to street hawkers and local townships within the area (informal market). Increasing markets supplied has resulted in pilferage decreasing on farm.

The owner stipulated that constraints still significantly impact the profitability of small-scale farmers far greater than that of commercial farmers. The knowledge base developed by commercial farmers is vital in the survival of small-scale farmers. Education and knowledge are vital for this sector, it will create entrepreneur confidence to stimulate production efficiency.



Figure 12: Elandskraal farming

5.3.5 Case E: Green City Farms

This 32-year-old owner of a Hydroponics Small-Scale Farm located in Gauteng has shown what true entrepreneurial spirit comprises of. This owner is the epitome of eat, sleep and breath agriculture. That leveraging one's passion in any sector, you can create a niche market. By only completing matric, this business owner has managed to build a business that is not only successful, but it provides employment to thirty individuals. Case E established his hydroponic business in 2007.

Starting small due to not having the financial means to make this business his primary source of income. The business was funded through commissions obtained by being a rep for numerous companies that have no association to small-scale farming. Case E's clients consist of small food industries to that of large corporation such as Dischem. The focus was derived early on in Case E's career, making a concerted effort to apply artificial intelligence to farming practices found in today's sector. The business was built around using low-cost materials in the production set up of farming. Understanding the resource scarcity situation within South Africa, closed looped water systems became the main objective in phase one of the business.

Demonstrating a significant water use reduction, while still being able to produce the same quality of product.

The business today consists of three farms, located in Krugersdorp, Johannesburg and Nelspruit. Case E provides as clients with the personalized feel. The owner will incorporate all stakeholders within the supply chain to ensure transparency for all. The owner encompasses ethical farming practices. All produce that is produced on the farmers will meet Global G.A.P standards, irrespective of being supplied locally or for exported. This business owner has transition from that of a small-scale farmer to being commercial as well as providing all new emerging small-scale farmers with critical information.



Figure 13: Green city farmers

5.3.6 Industry Expert 1: CGA Grower Development Company

An institution that was founded in 2000. This industry spearheads the development of black citrus growers within South Africa. The role played by this organization is to ensure training and the transfer of skills is maintained for black citrus growers. The company formed the Citrus Growers Development Chamber (CGDC), where it encompassed the views surrounding the constraints faced by black citrus growers. This platform ensured the needs of the small-scale black farmers were understood in order to determine a suitable solution.

The organization identified that amongst the small-scale black citrus farmers, support was the crucial element missing. The organization thus embarked on a directive, based on situational analysis to establish a specific purpose vehicle to address the constraints faced by these respective small-scale growers. The establishment of the Citrus Growers Association Grower Development Company (NPC). This vehicle would drive solutions to contextual constraints faced by small-scale black farmers as well ensure a significant impact on transformation is seen in the citrus industry.

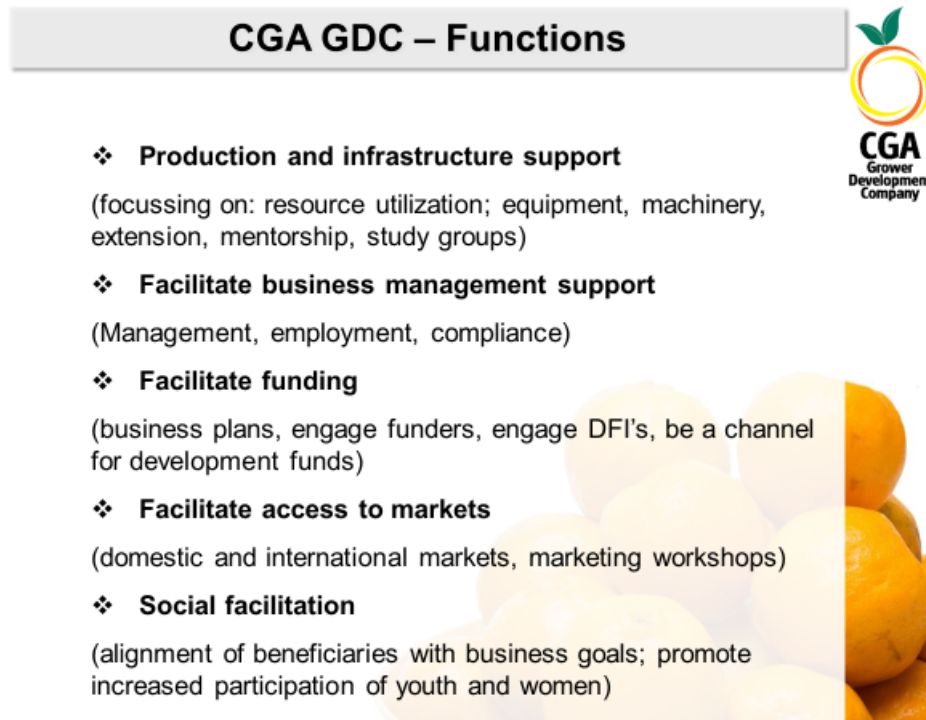


Figure 14: CGA GDC-Functions

5.3.7 Industry Expert 2: Artificial Intelligence Group (AI)

The organizations main objective is to develop synergies amongst ideas based in statistical, cognitive science, engineering, mechanised learning, biology and statistics. The main function is to develop practical applications for current industry sector constraints. This business makes use of big data to develop disrupting innovative technologies for every sector. The agriculture sector has not provided consistent predictions during the production phase of crops. Farmers spend significant times worrying about the quality of their crops.

The AI group makes use of high-end and useful computer algorithms to analyse decades of weather and crop information. This has provided current farmers with a tool to determine yields per crop with absolute accuracy. All of this done prior to planting a single seed.

Artificial intelligence, using Big Data has enabled farmers to identify and initiate harvesting when the yield of the crop is at its maximum production efficiency level. This ensures farmers can obtain maximum revenue margins per crop planted and forecast accurately in terms of required resources. Reducing the cost of production which maximised capital retention to develop alternate crops.

This business is liked to Case E. The owner of the small-scale hydroponic farm pivoted to ensure constraints faced in small-scale farming sector was understood. The ideation of solutions to contextual constraints faced by small-scale farmers in today's current environment. Becoming an expert within the field of small-scale farming, this has provided Case E with industry knowledge, which is shared with all up and coming small-scale farmers. The reputation within the industry to assist small-scale farmers while being a small-scale farmer himself has closed the learning gap today. This has mitigated many challenges faced by current small-scale farmers as they do not need to pay the initial 'school-fees' when entering the agriculture sector.

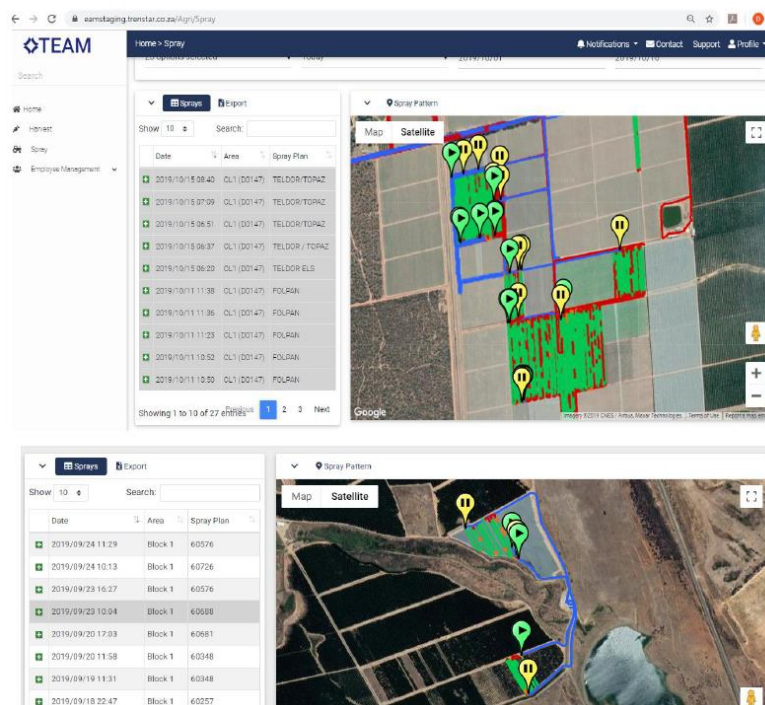


Figure 15: Collected data for spray schedule

5.4 Primary Research Question: Resource and Contextual Constraints Results of Small-scale farming sector

Making use of the resource-based view and supply chain theory as the conceptual framework, the aim of this primary research question was to ascertain if resource and contextual constraints impact the efficiency of small-scale farmers supply chains. The data determined the impact, either being high or low in relation to current business model and business model innovation of small-scale farmers supply chains in South Africa.

In breaking down the primary research question into further two sub questions, the first sub-question looked to identify the significant components that make up the small-scale farming supply chains and how resource and contextual constraints impact this efficiency. The second sub-question looked to identify specific constraints within the small-scale supply chain that would impact business innovation and business model innovation. The results will be detailed per specific heading throughout Chapter 5. In analysis the data, coding was used as the tool to draw out key themes obtained from the respondents' transcripts. All research questions themes can be seen in the network diagram which is found in Appendix C.

Resource constraints and contextual constraints were identified by all respondents in the selected sample. Industry experts alluded to these constraints numerous times as being severe obstacles faced by small-scale farmers in developing an efficient supply chain. The questions posed to the respective respondents was used to ascertain the individuals background, motives for entering the agriculture sector and understand what sector constraints impacted the business based on the lack of resources available for the small-scale farmers when beginning the business. Additional questions were posed in determining current business constraints. The questions used were to understand if resource constraints and contextual constraints still play a significant role in day-to-day operational running of the business.

In addition to the responses received from the small-scale farmers in each case, industry expert responses provided an alternate view in understanding their view points around resource and contextual constraints with the small-scale agriculture sector. Experts provided their own insight as being past small-scale farmers and what constraints they encountered during their business operations. The experts also weighed in on what they deemed being the most significant obstacles when it comes to running a business as well as what opportunities current small-scale farmers could leverage within the agriculture sector of South Africa.

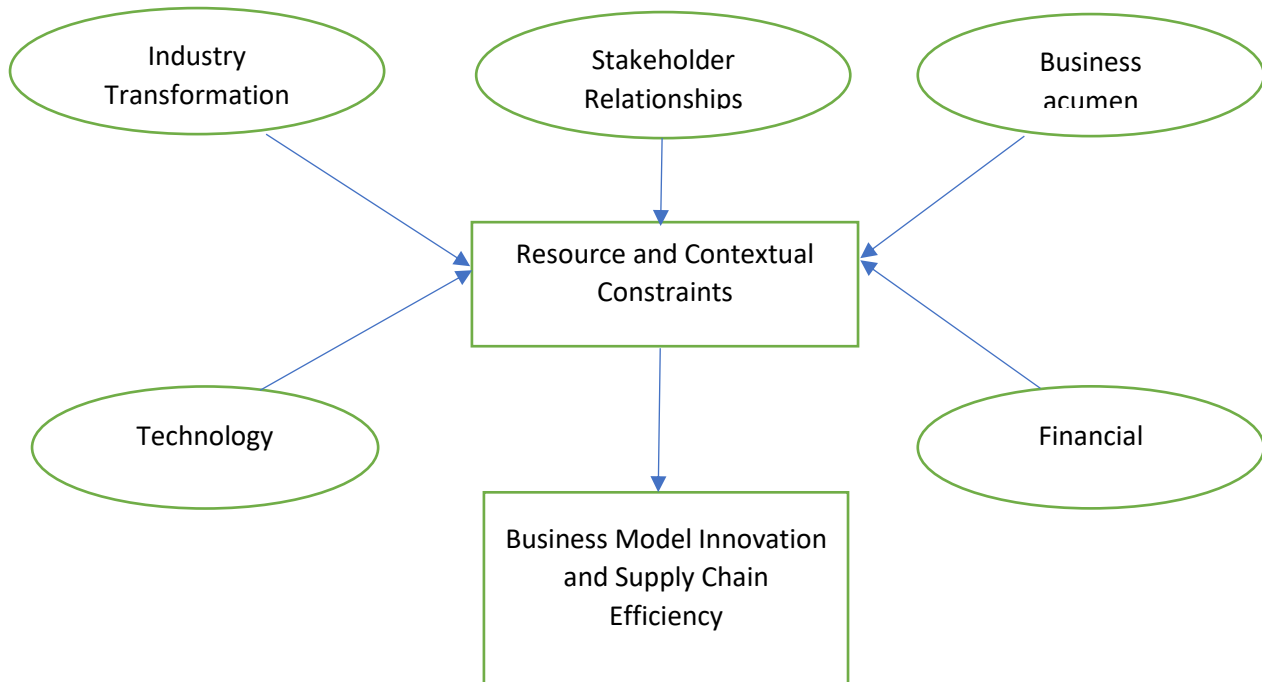


Figure 16: Structure of resource & contextual constraints-impact on business model innovation and supply chain efficiency

5.4.1 Resource Constraints

The most prominent resource constraints evident from the data originated with respect to inputs available in order to complete a defined task. The data can be grouped into three main themes: physical, financial and technological constraints. These resources are typically associated to third world economies, which is evident in the small-scale farming sector of South Africa.

Physical Constraints

The data collected demonstrated that the small-scale farming sector lacked adequate physical resources to support the current supply chain efficiency. The predominant constraints associated to this theme was water scarcity, poor infrastructure, acquisition of land and limited support from institutions. The results demonstrate that this environment provides a significant barrier to do business in as well as live in.

Case C: “So we struggle to get everything”

Case A: “ land is very expensive”

Case D: “Uh at this moment the business we are at least getting a bit up with everything”

Case B: “to us they should look at giving us the title deeds”

IE 1A: “Land tenure also for this small-scale farmer, it becomes a very big cost”

Case A: “You need proper irrigation”

Case E: “You can't not afford to have good implements”

Case C: “Like in the citrus farming, you need a tractor that can spray in time”

Case A: “It's just depending on water”

Case B: “And I do appreciate the fact that the government would sometimes give support”

Case E: “you can have the best system. If you do not know how to manage, is it useful”

Case A: “So to pay water electricity, Eskom, workers, all that pumps. To have 7 years before income is made”

Case C: “So it's very difficult for us to get things done in time”

Case A: “That's for us our biggest threat at the moment. We sit with land and it's our main income, we don't have that security of a small-scale farmer people leaving our land to someone else and people just running down. So ja, then also big farmers are working on collaborations with BEE's and those assisting them”

Financial Constraints

All respondents stipulated that the finance element associated to small-scale farming provided a significant constraint in terms of running an efficient operation. The required capital to purchase necessary infrastructure equipment was not always available due to poor yield returns generated from past crops. The lack of resources within the geographic location (water rights) also impacted the production of crops during a season. Within this sector, business survival and growth in burdensome, add in no financial assistance-this objective becomes increasing more obstructive to remain profitable for the long-term.

Case B: “Because if you’re selling to the fruit juicers they are obviously paying less for the produce”

Case B: “lack of funding from the government”

Case C: “Because most of the things that we fail to do is because of finance not available”

Case D: “We did everything but the only thing that got short is how do we finance the cost of buying equipment”

Case A: “You need to pay for all of it, it costs money”

Case D: “Well in the beginning two years ago we had a grant that was given by the government”

IE 1A: “But unfortunately, due to financial issues and other things.

IE 2B: “Finance purely finance or lack of finance, you can't reach your required output”

A contributing factor to the financial constraint was Government not providing ‘title deeds’ of the land being redistributed to the small-scale farmers. A document stipulating ‘Permission to Occupy (PTO)’ is not accepted by any financial institution within South Africa. As the small-scale farmers cannot provide collateral for required loans, they are unable to obtain the necessary capital required to ensure their operations develops to yield far greater returns.

Case C: “finance, the bank doesn't want to make loans to us as we are small-scale farmers”

Case B: “right now with only a title deed, you cannot access financing from the banks”

Case B: “we’re on a long-term lease”

Case D: “we're struggling to get assistance on finance from the banks”

Case B: “That's the constraints you face from the banking sector”

Case A: “You can’t go to the bank without security or a deposit”

Case E: “But then again you can't do everything alone unless you had a big finance investment”

Case D: “Because being a small-scale farmer, the farm is not on my name it's still government property”

IE 2B: “But the banks are not completely satisfied with the PTO”

Technology Constraints

With the data demonstrating numerous physical constraints, an expectation that technological constraints would be evident from the sample population in small-scale farming was confirmed. The absence of technology within the business environment created a significant constraint for the small-scale farms to be efficient. Small-scale farmers are aware of technology available, but as mentioned above the financial constraint is hindering these owners to purchase new technology.

With the farmers not having smartphones, real-time access to email, market sector developments and current issues in farming demonstrated this resource was not readily available for small-scale farmers to leverage within their business. All respondents did not mention any use in terms of social media platforms to promote their business. All research related to market demand is currently been conducted by third party service providers.

Case A: “We are very basic with technology”

Case C: “Uh if you look at the commercial farmers they’re using the modern technology to farm”

Case B: “Something to help irrigation so that your scheduling can be right”

Case D: “Also like the solar system for all four boreholes because in my farm I don’t have lots of water”

IE 2B: “We utilize a sensory application program and we try and monitor all our productions to minimize loss”

IE 1A: “Farmers do not even to have a proper cell phone”

5.4.2 Contextual Constraints

Derived from the data, the main contextual constraints that came to the fore was that of the apartheid legacy, government involvement , entrepreneur personal development within the agriculture sector and stakeholder involvement for small-scale farmers.

Apartheid Legacy

With South Africa’s apartheid history, this contextual constraint was revealed more subtly during conversations held with Case A and Case D. The country’s history still has an impact on relationships held between that of all farmers within the agriculture sector. The socio-economic injustice towards black South African’s who were forcefully removed from lands farmed by their ancestors. With the results not yielding exact details, the subtle responses provided by two of the cases show the effects associated with the apartheid system which are still evident in the minds of these small-scale farmers.

The effects of race within this sector can still be observed. Black small-scale farmers are painted with typical stereotype of all must be given for free. This is evident in the power bases held by the respective black and white farmers. Symposiums, quarterly meetings are held within the area to provide all farmers with the latest information associated to R&D, pesticides and herbicides, phytosanitary diseases and general market related demand.

These meetings are held in ‘Afrikaans’. Majority of attendees are white farmers with the rest consisting of black farmers who can understand the language but not speak it. A distinct disinvestment from white farmers within the area in terms of infrastructure due to the unpredictable element associated around land reform.

Case D: “they paint you with the same colour because they assume that you don’t know”

Case A: “because of the transformation of land. Now they’re getting sceptical”

Case A: “It’s not sustainable to build a pack house. None in this valley own their own pack houses. It’s not like Groblersdal and in Limpopo. They get funding for that, but it’s misused”

Case A: “But they do something wrong, they don’t have fruit on the trees. But then the government supply them with packhouses. R300million of pack houses. But they don’t have fruit to put through the pack houses. Soos, dis omgekeerd”

Case D: “Well my more and more input from those from expert expert people you know if we can work with other farmers like you know OK I'm gonna be off off off off more of the white farmers are more experienced. And they've been in the game for quite a long time”



Figure 17: Farm meeting

It is evident that meetings held as shown above will continue to create the divide that currently exists between that of black and white farmers. The stereotype will remain intact for years to come.

Government Involvement

In analysing the data, a strong theme of government involvement was articulated. Case B, C and D refer substantially to the importance of government intervention within the process of land acquisition, providing funding and the initial stage of support with regards to farm development. With all three cases, coming from a previously disadvantaged background; they

have praised how the government has elevated their social status in providing them with land to become efficient farmers.

The only concerns raised by the respective cases is that of continued support through additional sources of funding or providing them with the title deeds. One other contextual constraint identified was that of educational support and training. The limited hours allocated by the local municipality is not enough to ensure the farmers remain in the know and receive the latest market data pertaining to demand of produce.

Case B: “Now if you don't have money that becomes a problem”

Case C: “finance to get everything done in time that will help us”

Case D: “Access to finance production input would be of great help”

Case B: “The support should be ongoing until you are your feet”

Case C: “We need the intervention that if they can help us as the small-scale farmers”

Case D: “More used to get more knowledge on how to grow”

Case D: “and also mentorship because you never so say you know things like an expert”

Case D: “Working together with them. In terms of just seeing what they do how they do it you know it's gonna give me a lot of what's the word I'm looking for. It's gonna guarantee my confidence in what I'm doing because now this thing is something that is done differently by different people.

IE 1A: “I will say that this one that I've seen now in the past is in the past you realize that it was very difficult for the small growers because they were working separately and not in touch with the CGA”

IE 2B: “Education so that they can implement low cost strategies”

In contrast, Case A and E intimated that they have had no government involvement within their business. With Case A being a family owned business that has been passed down from generation to generation, the knowledge transfer has come with this. The owner has relied on

farming practices that have been successfully through the decades. The dedication to ensuring the farm remains productive. Case A has applied innovative solutions to the current farming practices to ensure maximum yield is obtained from each harvest.

Case A: “You need to work. If you inherit stuff you can’t just sit. You need to farm it or sell it or do something. Some people think you get this golden basket, it’s work. From there on its work. Everything is maintenance”

Case A: “So you must know where your fruit is going, to know what to put in”

Case E, a budding entrepreneur within the small-scale environment built his business on the passion for the industry.

Case E: “That’s my passion”

Case E: “I obviously had a love for growing things”

With the dedicated drive for the development of his business, the owner worked numerous jobs to facilitate his passion to build the business. No financial support of training and development was provided by the government. Case E questioned experts to understand the sector before establishing his infrastructure.

Case E: “And then I figured out that there is a market for fresh produce for niche produce as went around speaking to a few potential buyers and I saw some interest for future prospects of crops where nothing had been done. I said Here’s a sample if I can grow the market you need will you buy from me and the guy said I will support you.”

Entrepreneur Development

The stipulated experience detailed by all cases as well as skills developed by small-scale farmers showcase contextual constraints. The skills and experience obtained originated through initially been self-taught, obtained from previous job-related training and passed down family knowledge. Cases B, C and D of the five cases developed their experience and skills by initially working on farms as employees before venturing out and beginning their businesses.

Case A is a family business, which the owner inherited. The owner was influenced by family experience. Skills gained for this owner was shared around the dining room table and visually observing the family members during operational requirements. Collaboration with surrounding commercial farmers in order to sustain current limited production.

Case A: “Your fields recorded. Being able to see where you did your spray”

Case A: “you have to farm precise”

Case A: “We initially would not be able to do it if we didn’t collaborate with a bigger company”

Case E, this is the exception to all individuals’ interviews. The owner, after completing his matric entered the agriculture sector with no prior experience or skill. He is self-taught. The passion for the industry drove the owner to engage with all respective individuals to garner an understanding of current opportunities in the sector. The motivation displayed to venture out and start your business was contextually constrained due current background and financial situation. The owner had to rely on alternate ways to fund the business as well as ensure efficient running of the operation.

Case E: “We new to the sector. I obviously had a love for growing things. I loved growing vegetables in my veggie garden. I also had a landscaping gig going on during the same time”

Case E: “We started getting more interest. One thing led to another from smaller orders to medium orders to bigger orders to now currently, setting up farms having our own farms, having contract farmers contracted towards our suppliers and we've got a whole chain going with that”

Case E: “And then I figured out that there is a market for fresh produce for niche produce as went around speaking to a few potential buyers and I saw some interest for future prospects of crops where nothing had been done. I said Here's a sample if I can grow the market you need will you buy from me and the guy said I will support you”

Case E: “Long story short, 11 years of being in farming. It's you that you don't learn that ever not like you. In and out of restaurants in and out of catering companies in and out of meetings speaking to people here and there finding out what this one does, what

that's one does, who's the buyer here and what is used by this consumer. It just takes a lot of R and D and it just comes down to experience in the industry and 11 years in, you learn a large amount by being in the industry. A lot comes across your desk, a lot of potential buyers especially when your produce stands out and people come and find you and then they want you to implement projects that come with finance, they want you to build projects, want you to implement your strategies on the farms so they can produce those consistent numbers that you produce at the rates, at that price so that they can have the margins they get with this produce.”

Stakeholder Involvement

Having detailed the contextual constraints pertaining to the small-scale farmer from an entrepreneurial perspective, will now look at the stakeholder relationships that exist within the small-scale farming sector. This comprises of the relationships that exist with commercial farmers and that of regulatory institutions. These relationships exhibit their own contextual constraints.

To create clarity before unpacking the contextual constraints, its necessary to understand who the respective stakeholders are that contribute to development of these small-scale farmers.

Table 3: Summary of Stakeholders used outside of the small-scale farming sector

Case	Supplier's Name	Data
A,B,C,D	Citrus Growers Association of South Africa (CGA)	“They form a company around that objective, hence you have the CRI to research international there which the focus is to do research and make sure that you know it prepares the farmers so that they could compete globally”
A,B, C,D	Magalies Citrus	“And locally how you will also have extension offers from Magalies Citrus who also help us in that regard”

A,B,C,D,E	Global G.A.P	<p>“I just mean like a global gap standard produce because those are the things you going to produce and if you got global standard you can supply first world countries as they will easily accept your crops”</p> <p>“You have to meet certain criteria and if you're able to meet it they'll grab your produce and if you can produce within the margins that are comfortable for you, you can then decide to supply them and then you can supply them and they'll purchase your crop gladly and you'll be a successful farmer if you implement the correct strategies”</p>
B,C,D	Department of Agriculture and Rural Development	<p>“The Support we do get from our government, but we don't get also from the institutions either or if the conditions can just be easier for us to be able to. Proper support and I think it will”</p>
A, E	Retailers	<p>“Like Pick 'n Pay, Woollies and Spar are also strict”</p> <p>“Yes, there are a couple of things we did a project at the Dischem foundation and it was all low-cost strategies at producing first world produce.”</p> <p>“But we put some nice strategies in place in the Dischem Foundation and the farms going very nice. It's got a lot of low cost”</p>
E	Local Markets	<p>“Well you can with finance, anything is possible. If you had to buy a house then you could create all the elements of a buying place like the market JHB CBD”</p>

		“If you go to the JHB market, they fill up trucks, horse and trailer they go to Mozambique with potatoes and onions and carrots and garlic”
C, E	Export Agents	“The exporter is the guy who go and get the markets”
A, B,C,D	Commercial Farmers	“Well not so easy unless of course you've got quite a relationship that build do with it sometime”

With the data stipulated above, all cases make use of a stakeholder which is based outside of the small-scale farming sector supply chain to benefit their business. Looking at these relationships contextually, each supplier has a direct involvement in the success of these businesses. From these relationships, numerous themes emerged from the data.

From the farmers perspective, certain suppliers (CGA, Global G.A.P and the Department of Agriculture and Rural Development), provide the small-scale farmers with direct input associated to the growing of crops to meet international standards for export, disease identification data pertaining to current market related issues as well as what crop diseases are expected to arrive from neighbouring countries. Information reliability ensures foresight for the farmers, they can plan according. This minimized future damage to crops while ensuring maximum revenue generation to cover operational expenses.

With regards to the next identified suppliers (Magalies Citrus, Retailers, export agents and local markets), they all provide a significant specific service to small-scale farmers. Local client base in terms of markets and hawkers who provide instant cash flow due to cash sales, but at a lower price (reduced margin). This allows for continuous cash flow on a month to month schedule. Ensuring all accounts are paid to continue productivity for long-term crops.

Magalies Citrus provides farmers with an alternate source of income for produce that does not meet retail procurement policies or export standards. This facility ensures all produce is accounted for and provides an additional revenue stream for the farmers. Farmers are paid on a 30-day account based on tonnage delivery for juicing. Export agents provide contract farming accounts based on tonnage that will need to be delivery on a future date. Farmers obtaining this account ensures dedicated work as well as provides an opportunity to establish their brand within the export market.

As listed below with Case A, the larger commercial farmers play a significant role in terms of a key stakeholder. Small-scale farmers are not able to develop their current infrastructure due to financial constraints. The relationship developed ensures small-scale farmers within the region can make use of the facilities offered by the commercial farmer at a reduced cost. This cost is significantly cheaper in the short-term compared to the capital outlay required to develop one's own "packhouse". The added value driver for small-scale farmers is that of tacit knowledge transfer. The commercial farmer can assist the small-scale farmer with small operational intricacies that will enhance the current production yield.

Case A: "So ja, then also big farmers are working on collaborations with BEE's and those assisting them"

In the case from the supplier's perspective, developing key relationships with small-scale farmers is critical in developing and maintaining their reputation within the market. CGA and Global G.A.P rely on the farmers to inform them of site related incidents. This is from the identification of new diseases to control of current (impact of pesticides and herbicides). Test pilots are run by farmers for these institutions.

Magalies citrus, local markets and export agents rely on the small-scale farmer to produce high quality produce. The reputation these suppliers hold within the economy is based on the supply from the small-scale farmer. The results indicate that a mutually beneficial relationship is evident between these respective individuals.

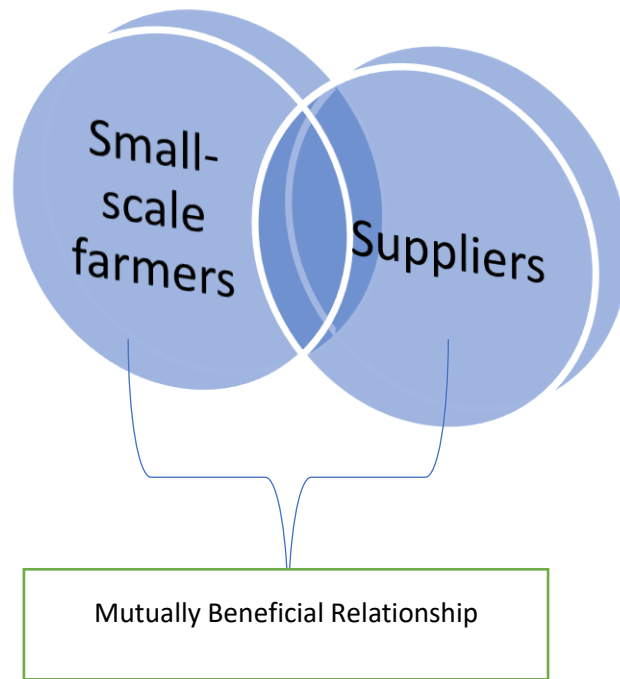


Figure 18: Mutually beneficial farmer supplier relationship

5.5 Sub-question 1: Most significant components affecting Small-Scale farming operations

In determining the aim for sub-question one, identification of critical components within the supply chain of small-scale farmers was asked. This process deemed to identify if any components differed from the perspective of the small-scale farmer to that of the industry expert with regards to importance.

In order to ascertain if comparisons will exist in the respondent's answers associated to key components, small-scale farmers and experts were asked to identify which components they deemed the most important for successful operations. Insight in trying to determine if the same components per geographic location, per small-scale were the same or if any additional components could be identified.

The above was tied back to industry experts in ascertaining if the same components were identified or any alternate components mentioned.

Table 4: Components of significance for small-scale farmers

Components	Case A	Case B	Case C	Case D	Case E	Total
Infrastructure Development	√	√	√	√	√	5
Accountability-Ethical Farming					√	1
Technology	√			√	√	3
Flexibility	√				√	2
Finance		√	√	√	√	4
Training and Development	√	√	√	√	√	5
Passion	√	√		√	√	4
Regulatory Bodies	√	√	√	√	√	5
Government Involvement		√	√	√		3
Innovation	√			√	√	3
Product Quality	√	√	√	√	√	5
Sector Support		√	√	√		3
Export Market			√	√	√	3
Developed Farming Practices	√			√	√	3
Shared Economy	√				√	2

In analysing the data above, 15 components identified between the 5 case's that small-scale farmers deem relevant in terms of having a direct impact on operations. Of the 15 components, below is the breakdown in terms of important to the least important:

Table 5: Components hierarchy for small-scale farmers

Components	Case	Importance
Infrastructure Development	A, B,C, D,E	High Importance
Training and Development	A, B,C, D,E	
Regulatory Bodies	A, B,C, D,E	
Product Quality	A, B,C, D,E	
Finance	B,C,D,E	Medium to High Importance
Passion	A,B,D,E	
Government Involvement	B,C,D	Medium Importance
Sector Support	B,C,D	
Technology	A,D,E	
Developed Farming Practices	A,D,E	
Innovation	A,D,E	
Export Market	C,D,E	
Flexibility	A,E	
Shared Economy	A,E	Medium to Low Importance
Accountability-Ethical Farming	E	Low Importance

Case A, B, C, D and E all agree that infrastructure development, training and development , regulatory bodies and product quality is the most important component for small-scale farming operations to succeed.

Infrastructure Development

Case E: “If you've got to move it from farm to shop, how are you going to get it there without infringing its shelf life”

Case B: ”But we need to be careful of if we are citrus growers, we would need implements”

Case C: “Liken the citrus farming, you need a tractor that can spray in time”

Case A: “You can’t spray without a really good sprayer and a tractor”

Case D: “I would love to. But the problem is the cost of processing your fruits”

Training and Development

Case A: “Also to train them and learn them as well. They need to be willing to learn”

Case B: “Yes we are going through many courses and they you know getting up-skilled”

Case C: “We need the intervention that if they can help us as the small-scale farmers”

Case D: “more easier more used to get more knowledge on how to grow”

Case E: “There further involvement in the project, posts supplying the funds to do the project. Do they go post that, or do they leave it up to you”

Regulatory bodies

Case A: “Any type of when you are selling locally, or you export fruit”

Case B: “produce a good quality fruit and that is export compliant”

Case C: “So they feel that it's not worth it to provide yourself with a loan at the moment”

Case D: “Otherwise I was I was looking at last year. I just pulled back this year because I missed two programs last year, so I didn't export so I had to do with this”

Case E: “our management systems get looked at thoroughly and that's the only way we have access to supplying people like Woollies and Checkers and big scale contracts like that”

Product Quality

Case A: “The farmer is reliable, your average farmer is reliable on an export company

Case B: “Moving in that direction would you see yourself being more involved in the processing elements”

Case C: “It's all about taking care to your programs that we normally should spray and work”

Case D: “That is what is more critical to me because to do that you did you guaranteed to get a better product or if not good”

Case E: ” They have to hit their local market and they have to build themselves up to a point where they can then go and invest in the strategies that succeed”

Table 6: Components of significance for industry experts

Components	Industry Expert 1A	Industry Expert 2B	Total
Infrastructure Development	√	√	2
Accountability-Ethical Farming			0
Technology	√	√	2
Finance	√	√	2
Training and Development	√	√	2
Regulatory Bodies	√	√	2
Government Involvement	√		1
Innovation	√	√	2
Product Quality	√	√	2
Sector Support	√	√	2
Export Market	√	√	2

Developed Farming Practices	√	√	2
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In analysing the data above, 12 components identified between the 2 case's that industry experts deem relevant in terms of having a direct impact on operations. Of the 12 components, below is the breakdown in terms of important to the least important:

Table 7: Components hierarchy for industry experts

Components	Industry Expert	Importance
Infrastructure Development	1A, 2B	High Importance
Technology	1A, 2B	
Finance	1A, 2B	
Training and Development	1A, 2B	
Regulatory Bodies	1A, 2B	
Innovation	1A, 2B	
Product Quality	1A, 2B	
Sector Support	1A, 2B	
Export Market	1A, 2B	
Developed Farming Practices	1A, 2B	
Government Involvement	1B	Medium Importance
Accountability-Ethical Farming	N/A	Low Importance

Industry expert 1A and 2B have stipulated that infrastructure development, technology, finance, training and development , regulatory bodies, innovation, product quality, sector support, export market and developed farming practices are the most important component for small-scale farming operations to succeed.

Infrastructure Development

IE 1A: "infrastructure for example network. You don't have a very good network and you find that you know in terms of accessing information quickly that becomes a challenge"

IE 2B: "you can have the best system. If you do not know how to manage, is it any good.

Technology

IE 1A: “moving into a technological era, where in you find that we've still got farmers as small growers even though we is the same also for the commercial growers”

IE 2B: “If you look at the stats they're all there and it has to become more automated to become more controlled so that we can earn better profits on the crops as farmers”

Finance

IE 1A: “But unfortunately due to financial issues and other things”

IE 2B: “Geez wish finance was available for them so that they can implement the technology that we're able to give them”

Training and Development

IE 1A: “team coming from CRI coming from CGA and it is coming from the government that that also work on the market access to make sure that they go to countries negotiate open up access for the farmers to access these markets”

IE 2B: “Education so that they can implement low cost strategies”

Regulatory Bodies

IE 1A: “The other thing for the small growers is for them to to to have membership with this processing plant”

IE 2B: “I just mean like a global gap standard produce because those are the things you going to produce and if you got global standard you can supply first world countries as they will easily accept your crops”

Innovation

IE 1A: “That could also be a sign that you are over irrigating. So we would like to bring in good practices to try and beef up so that you know we could get more yield and then from optimal practice that we're using for example you might be over irrigating that means

the fertiliser that you're applying is going it's been leached out you see and what is leached out is being used by the three and for you you have fertilisers. But that fertiliser has been leached out because of that over irrigation. So, you know this kind of thing that we need to put in place to make sure that we improve”

IE 2B: “Basically hydroponic and AI farming .Artificial Intelligence farming is when census sense crops and different monitoring systems and they make a decision on behalf of you. In order to give the crop its best output potential. So, the future is AI farming. The future is artificial intelligence it is robots. It is a numbers game”

Product Quality

IE 1 A: “I would have liked a situation where it doesn't matter how small because the other thing is the size that you have. But as small growers we always encourage them”

IE 2B: “They're all over just with current clients of ours that have bought equipment from us that have hired us for consulting and designing of different projects on their farms”

Sector Support

IE 1A: “And they provide bursaries for the young stars farm workers or farmers themselves that they want to further on their studies”

IE 2B: “If there would be you know institutions, or you know that would educate the communities and educate people that wanted to go into farming and then more education”

Export Market

IE 1A: “But for those that want to export they will need to understand how to deal with phytosanitary issues. Issues like citrus black spot”

IE 2B: ” Yep and that's we implement (hydroponics). We travel all over the world. Then I grab all the knowledge and I bring it back and they implement it within our AI farming group”

Developed Farming Practices

IE1A: “You need to harvest your crop from the field take it to the pack house and then from the pack house straight to your clients. It could be your wholesalers. It could be you know your supermarkets. And for those crops that for those qualities that you know are inferior qualities you have to take it maybe straight, instead of even wasting your time,. through the pack house. And have that taken straight to the processing factory. If you thought the price for the present processing is not lucrative compared to a supermarket and then the end of the export. But you have to go through those lines”

IE 2B: “We utilize a sensory application program and we try and monitor all our systems thoroughly and work with the integrated aspects of technology because that gives you the consistent crops at the rates in which ensure comfortability which make sense for the buys that prepares them to make the purchase for the produce”

In comparing the respective answers provided by the small-scale farmers and the industry experts, four main themes are evident in terms of being a high priority for both representatives. The components which were highlighted by both respondents were; infrastructure development, training and development, regulatory bodies and product quality. These respective components identified for successful operational success shows alignment between that of small-scale farmers and industry experts.

A theme which emerged during the interview process that was not referred to by either of the industry experts looked at accountability-ethical farming. Case E highlighted this concern that farmers need to be aware of when conducting business. With the world in transition, transparency of process has become a critical element in all sectors of an economy. This vital component not shared by all the other case's is an interesting element for future discovery. Business's today, with respect to procurement departments are requiring significantly more data around the entire supply chain process.

Case E: “For me I think they just want the know its from an ethical background. Consumers want to know its fresh as the population is moving towards a health conscious lifestyle. Try to determine in terms of whether it's a fashion trend as well as or a health trend. And people just want to know where the food is produced and if it's farmed with ethics. If the set standards have been applied.

5.6 Sub-question 2: Constraints affecting business innovation and business model innovation in the small-scale farming sector.

This sub-question looks to understand the constraints faced by small-scale farmers within their business environment. This will look to understand and identify the respective enablers and challenges which influence business model innovation with regards to the small-scale farming sector.

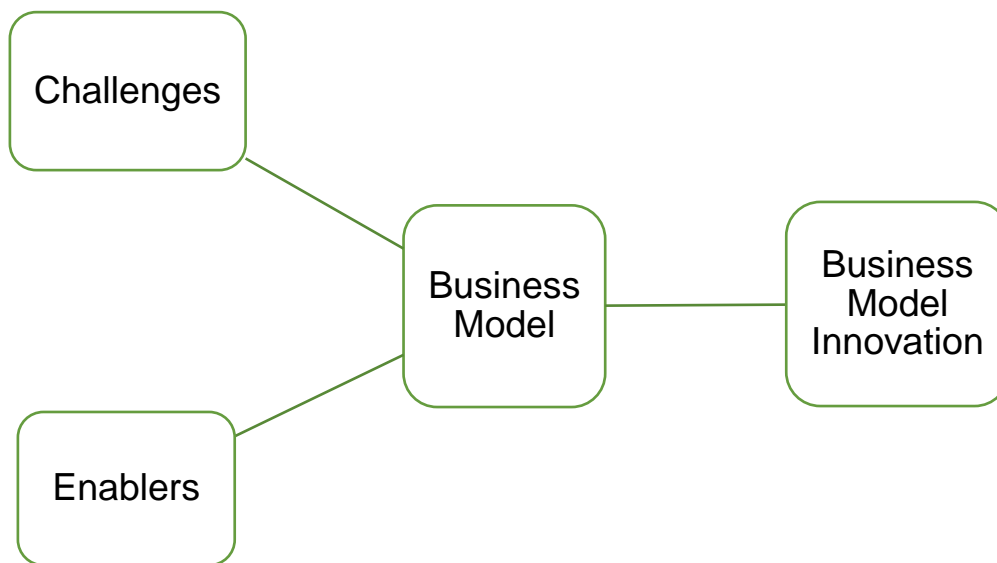


Figure 19: Enables/Challenges-Impact on small-scale farmers in business model innovation

With each small-scale farmer applying his/her own business model within the agriculture sector, an understanding of what each case deemed an enabler and what was a challenge. The respective constraints were identified for each case. The data gathered from the respective respondents identified the respective constraints faced in the small-scale farming sector. A comparison between the respective cases was looked at to identify if the respective enablers and challenges hold consistent across all small-scale farmers.

The challenges identified had a negative impact in association to the business model ensured business model innovation did not take place. This process thus indirectly had an impact on the business development within the short-term as well as sustained long-term growth.

In contrast, the enablers identified had a positive impact on the small-scale farming business environment. With providing a positive association, small-scale farmer business models altered with changing environment conditions which eluded to business model innovation.

In analysing the respective constraints, the environments created through the respective challenges and enablers and how this impacted business innovation. Looking at each case in ascertaining the required innovation in contrast with what innovation is required.

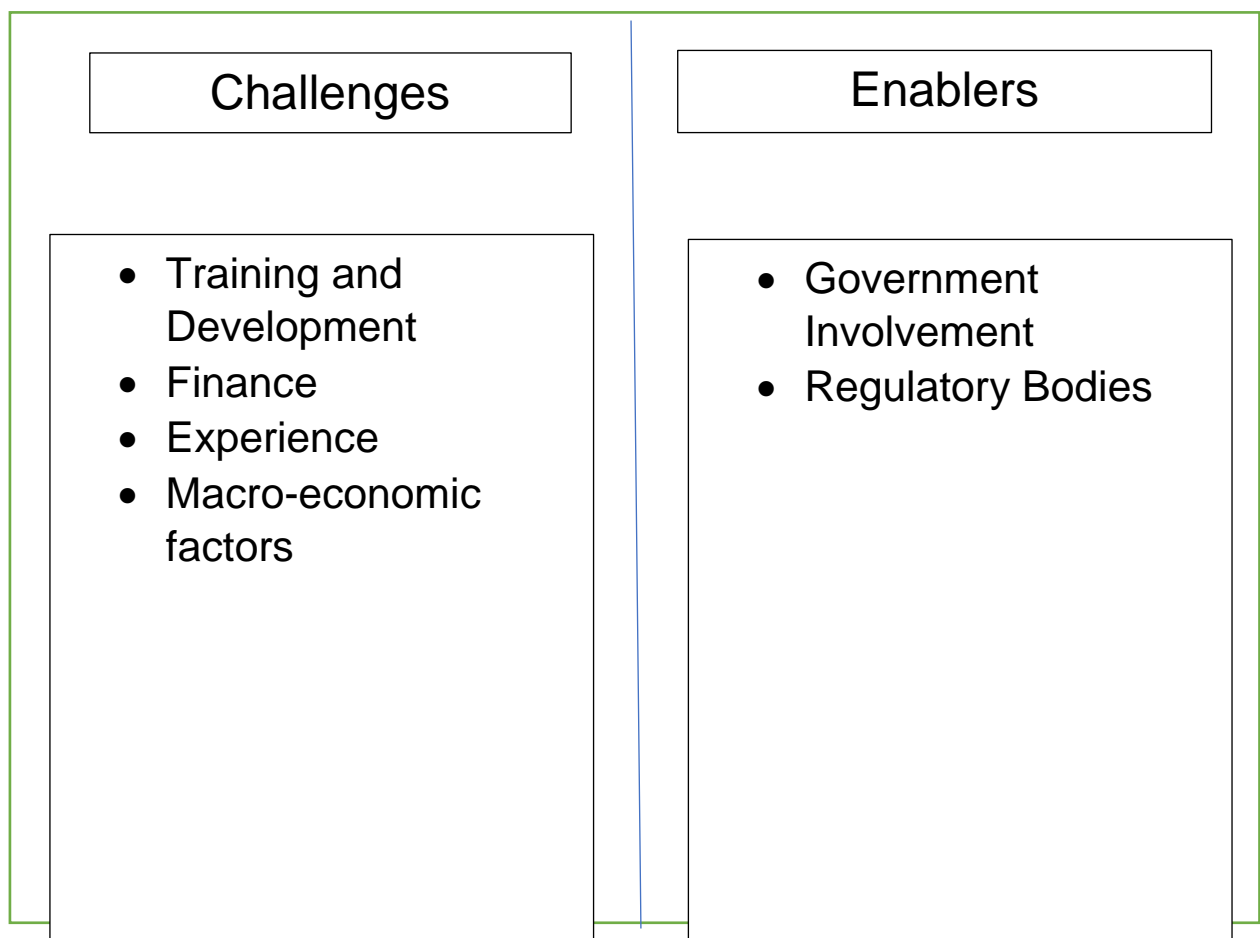


Figure 20: Identified enables and challenges within the small-scale farming environment

5.6.1 Challenges

The challenges identified within the small-scale farming environment (See Figure 18) will be expanded on below. Case respective evidence will be detailed per heading with regards to the constraints identified in relation to operational business activity within the small-scale farming business environment.

Training and Development

With training and development been regarded as one of the identifiable constraints, small-scale farmers who did not attend stipulated programs were noticeable more affected with identifying resolutions for challenges within the business environment. The lack of required knowledge which is provided at the respective programs creates a competitive advantage to allow small-scale farmers to make informed decisions.

Case E: “No good implements based on education you can't produce consistent crops and if not completely consistent crops being achieved, your niche markets are not viable”

IE 1A: “But for those that want to export they will need to understand how to deal with phytosanitary issues. Issues like citrus black spot”

Case A: “They assist these farmers on a quarterly basis. If there's any problem, they can assist. But ja, attending a function”

Case B: “Yes we are going through many many many courses and they you know getting up-skilled

Finance

A significant constraint eluded to by four of the five cases. The direct impact a financial constraint has on the respective business model is seen through operational choices. As small-scale farmers entering the agriculture sector, they are significantly 'cash strapped' in the short-term. The challenge surrounding this constraint impacts the business innovation. Operational activities on the farm is priorities to ensure continued production. With funds not being made available by the financial institutions due a farmer not being able to justify collateral, the negative impact during the first four years of operations is seen through no infrastructure development.

Case B: “Yes they did it did they. I think they the financiers you know all this financial institute should have confidence in us. If if the trees are like this they are likely going to produce something. So obviously I will be able to to to to service the loan rather than you know from the onset saying what it means is we need to kill now this orchard and we can't carry on”

Case C: “But the thing is, we need the money to do to try to buy all those kind of things. It's a problem to us but as small as we can get the new technology that we can use that we can afford. We think technology is very important just nowadays in farming.

Case A: “Any accreditation you need to do, you pay. Any type of Global Gap stuff you have to do, you pay. Any signage you have to put on, safety all of that, you need to pay. Nobody is bringing that signage for you. You need to take your people for training, you need to pay for that, you need to get them there. You need to get appointment there. You need to pay in advance. You know buy safety stuff. Put boards in the field. Those stuff, it costs money. If you don't have it you can't export. If you can't export, ja, if you can't pay it, you can't farm.

Case B: Lack of support lack of funding. You know as a small scale farmer you start to start from nowhere”

Experience

The concept around farming experience plays a significant role in the development of small-scale business effectiveness. This constraint can either be your biggest asset or crumbling block. In obtaining data, the length of service within the industry provide insights as to the current development of the respective farms. Farmers who have been in the industry sector for longer periods, demonstrate a more stable business model with business model innovation becoming more relevant for improved production yields.

Case C: “I've entered into Citrus Farming in 2012. Before 2012 I was working with crops sunflower so I was interested in citrus. We apply for the land in the land development and land reform.

Case C, with 7 years of business-related experience is now one of the first black co-operatives that have entered the export market. The development of the farm has come with numerous challenges, but today it has seen the co-operative enhance its business model to supply numerous markets. The owners have innovated their business to meet standards and ensure quantity produced is sold for increased margins.

In contrast, when analysing data from Case B, a black female small-scale farmer. The owner entered the agricultural sector in 2015.

Case B: “acquired the farm through the government plus progress program. I started in 2015 October and I am a citrus farmer”

The experience gained within this sector has seen the owner still rely on local government funding for the continuation of business functionality. This owner is still within the development phase of production as no business models are evident, nor the impetus to engage in business model innovation. The functionality is based on currently just surviving the initial growth phase of produce before alternate markets can be sourced. Currently the owner, due to limited funding supplies one market in order to generate capital to keep the farm operational while waiting on additional support from the government.

Case B: “Uhm. There isn't. There isn't much of finances right now because. Obviously one is doing damage research, damage control. So if you if you get into this money then you have to attend to this is now.”

Case B: “Predominately finance so that your biggest constraint at the moment. So you can't afford the technology at the moment”

Macro-economic factors

This constraint added an additional challenge to the environment of small-scale farmers. When the country's economic conditions are not favourable, the business sentiment is low and current business enter survival mode. Limited business innovation is applied due to the financial constraint mentioned earlier. No development in business model innovation as business owners are not able to purchase required assets due to a significant drop in margins received from produce. Markets will not pay the same price for produce as the demand from consumers is evident.

Case B: “Because if you're selling to the fruit juicers they are obviously paying you a minimum per KG. So it's ongoing you cannot. You will never have money whilst you producing fruit juicing”

Case E: “The price of vegetables has not increased for many many years. If you look at the stats they're all there and it has to become more automated to become more controlled so that we can earn better profits on the crops as farmers”

5.6.2 Enablers

The below sub-headings (see Figure 18), will demonstrate evidence from data analyses which creates a positive environment for business owners to carry out operational activities. These enablers provide an environment more suitable for small-scale farmers to conduct business model innovation.

Government Involvement

Within South Africa, government plays a significant role in the development of a economy. Within the small-scale farming sector, a significant drive to develop black small-scale farmers. This directive is to ensure the sustainable development and upliftment of farmers within the agriculture sector.

Currently, of the five cases; the government has assisted three small-scale farmers in acquiring the current land they farm and provided initial funding for two of the cases. This involvement has seen black small-scale farmers receive the opportunity to change the current environment they are involved in. The only detrimental factor is that of continued support.

Case B: “I acquired the farm through the government plus progress program”

Case D: “Well I applied for a farm to the citrus farm since 2002. Through the years I managed to secure farm”

Case C: “We apply for the land in the land development and land reform.

Case B: “You know as a small scale farmer you start to start from nowhere. And I do appreciate the fact that the government would sometimes give you a grant. But for me it doesn't help much if they keep your current and they leave you halfway. The support should be ongoing until you are your feet”

Case D: “It's gonna guarantee my my confidence in what I'm doing because now this thing is something that is done differently by different people. And if you you need to get it right you've got to do what is right. So my involvement with the farmers more involvement with those that know. But myself as well having assistance from you know

the institutions as well. It's not more about money but it's more about what I put into the crop itself to get better results”

Regulatory Bodies

The involvement of regulatory bodies within the small-scale farming sector is a significant enabler in the production phase. The regulatory bodies provide farmers with key insights into current and future related constraints. This access to information for the farmer ensures alignment with international and local standards. Produce that is generated will ensure cash flow into the business which will allow for business innovation. Through business innovation, small-scale farmers can produce significant more yields per square meter. Access to information ensure that during the planning phase, key resources are not wasted. This ultimately reduces operational expenses which allows for innovative practices to be applied to the business model.

Case A: “With this Global Gap there came this new thing Siza, that needs for social responsibility for us to export to Europe and UK”

IE 1A: “The good thing that is happening now. We we we have what we call the citrus marketing forum that sits at the beginning of the year and then sits also after the season has passed. In the beginning of the year they look at you know what is happening in different markets because they've got people that are posted in different markets that come and give feedback in terms of where they are in terms of the specs or in terms of specification that is required in terms of what constrains us”

Case B: “Usually we have extension offices from CGA that helps us in that regard. And locally how you will also have extension offers from Magalies Citrus who also help us in that regard. We have symposiums and workshops and and you know to tell us where the markets are and what is in the markets leader”

Case E: “That's a global gap standard is. It allows you to hand in a piece of information to your buyer that tells you you picked it at this time, at this temperature, this is the quality level, this is the water level per plant, this is the nutrient content per plant”

5.7 Conclusion

The results documented from this chapter were garnered from semi-structured interviews. The question asked was in line with the research questions stipulated in Chapter 3. The results associated to the respective research question and the sub-research questions have been detailed above. Results associated to the resource and contextual constraints, significant components of small-scale farming operations, levels of business model innovation and the respective challenges and enablers of the environment have been documented.

Each factor was detailed based on conducting data analysis associated to the selected sample population. Chapter 6 will provide a discussion of the results, identifying any similarities or differences in relation to the literature review of this research.

Chapter 6: Discussion of Results

6.1 Introduction

Chapter 6 will attempt to link the results obtained in Chapter 5 with the insights garnered from the literature stipulated in Chapter 2. This process will provide a base in terms of determining if the findings of this research links to current literature. In the event unique findings are determined, this will be documented for future research. For this discussion, my primary research question made use of the overarching framework that speaks to the resourced based view, supply chain theory and business model innovation. In sub-questions 1 and 2, this looks at the viewpoint associated to the current constraints face by small-scale farmers within their operational environment. The impact of these constraints in terms of an efficient operation within the dedicated supply chain.

The identification of new factors within the research that are discovered and contribute on improving the efficient operations of the stipulated business models for small-scale farmers will be detailed.

6.2 Primary Research Question-Results Discussion

By making use of the resource-based view and supply chain theory as the conceptual framework, this assisted in determining the elements of resource and contextual constraints that impede supply chain efficiency of small-scale farmers. The aim was to develop the severity of these constraints on small-scale farmers and ascertain the direct impact this would have on the supply chain. In understanding the constraints, entrepreneurial insight in determining a plausible directive in mitigating these constraints. In developing on this research question, Sub-research question one and two will delve deeper into understanding the specific constraints that restrict efficiency within the operations and how this has impacted business model innovation and business innovation for small-scale farmers.

6.2.1 Resource and Contextual Constraints

Through analysis of the data, numerous resource and contextual constraints became evident within the small-scale farming sector, with reference to how this impeded the supply chain efficiency. In ascertain these results, data was collected from a define sample. Questions were posed that investigated the entrepreneurs background, reason for being a small-scale farmer

and identifying the key constraints which were deemed as impeding factors to operational and supply chain efficiency. In addition, themes were generated for these constraints, namely physical constraints, financial constraints and technology constraints. The subsequent two tables that will follow, identifies them in relation to the small-scale farming supply chain infrastructure.

Table 8: Summary of resource constraints

Resource Constraint Source	Identification of Resource Constraint
Physical Constraint	<ul style="list-style-type: none"> • Limited infrastructure which creates increase inefficiencies for production and growth • Land ownership is based on lease terms with the Local Government • Current environment is harsh in terms of conducive business conditions • Allocation of water is scarce due to current climate • Significant lack of Government support, post the initial development of the farm
Financial Constraint	<ul style="list-style-type: none"> • Financial institutions refrain from providing loans due to no collateral provided by the farmer • Low margins obtained from buyers with respect to local markets • Increased water rights are costly

Technology Constraint	<ul style="list-style-type: none"> • Limited connectivity for black small-scale farmers with regards to access to email and internet (cost of data) • Due to financial constraint, small-scale farmers are not able to purchase technologies which will enhance efficiency within the supply chain
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Table 9: Summary of contextual constraints

Contextual Constraint Source	Identification of Contextual Constraint
Apartheid Legacy	<ul style="list-style-type: none"> • The subtle injustice in terms of the lack of formulating true relationships between that of black small-scale farmers and white farmers • Direct disrespect of language used when meetings are held on commercial farms • Typical black small-scale farmer stereotyping from all other farmers.
Government Involvement	<ul style="list-style-type: none"> • Initial up-front support and loan provided. The continued support post that is dismal • Move to provide small-scale farmers with title deeds

	<ul style="list-style-type: none"> • Government needs to provide access to expert knowledge base for continued learning by small-scale farmers
<p>Entrepreneur personal development</p>	<ul style="list-style-type: none"> • Business experience and skill developed from past working expertise • Entrepreneurs developed through being self-taught, exposed to family business and experience developed by being employees before becoming a small-scale farmer • Personal passion for the agriculture sector. Being able to create an efficient industry
<p>Stakeholder Involvement</p>	<ul style="list-style-type: none"> • The direct mutually beneficial relationship between institutions and small-scale farmers ensures the agriculture sector remains relevant • Direct supply and access to industry related knowledge, proving insight and support for production • Commercial farmers providing access to infrastructure due to significant capital expense. • Commercial farmers hold a significant amount of farming

	knowledge, small-scale farmers receiving this tacit knowledge
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6.2.2 Resource-based view

Based on the above resource and contextual constraints identified within the small-scale farming sector, the environment can thus be classified as resource constrained. Looking at the current sector, the demand for food has been increasing year on year (Elferink and Schierhorn, 2016). The agriculture sector being one of the key sectors within South Africa, the associated constraints need to be addressed. Now by making use of a resource-based view, the following section will now be alluded to how these constraints impede not only the efficiency of the operations but to what extent the small-scale farmer (entrepreneur) leverages the resource with the constrained environment to ensure his efficiency of production is not affected. In detailing the resource constraints above, small-scale farmers need to take this into consideration with regards to the environment of business. Small-scale farmers need to prioritize the above constraints in order to run a sustainable operation. By doing this, the business will obtain a competitive advantage with respect to other associated small-scale farmers. As defined by Campbell & Park (2017), a business leveraging its internal resources will maintain its sustainable competitive advantage.

Small-scale farmers, in relation to the produce need to ensure the respective attributes associated to their business are valuable, rare and hard to substitute (Campbell and Park, 2017).

Yil-Renko, Autio & Totti (2002), Prashantham & Dhanaraj (2010) provide a contrasting view in terms of the resource constraint. Does the quality of the resource or quantity of the resource create a greater opportunity for the small-scale farmer. Small-scale farmers need to ensure that when resources are consumed, this consumption is to the benefit of the long-term sustainability of the business. This view is in direct contrast to what resources are available in the small-scale farming sector currently. Only seventeen percent of the land is used to in the production of cash crops. This is a significant area of concern as with the abundance of land, small-scale farmers should be producing significant quantities to meet this growing food demand. The sector is faced with both a limit in terms of the quality of resources available as well as the desired quantity. When understanding the quality of a resource, this looks to what

systems have been established by institutions to regulate and control the quality production of crops. The direct involvement of the government within this sector as it contributes 2.2% to the Gross Domestic Product (GDP) and what innovation is available for the small-scale farmers to make them more efficient in their operational activities. Allowing them to compete with the likes of commercial farmers.

With small-scale farmers being exposed to a multitude of constraints related to the lack of adequate resources, resource scarcity becomes a significant hurdle for economic development. Lemley (2019) affirms that scarcity is at the core of economics. When one's own appropriation is restricted, there is reason to help others. With the small-scale farming community being significantly small, surrounding farms will assist in ensuring the efficiency of one farm is not compromised due to the current resource constraints within the sector for small-scale farmers. Renewable resources provide a significant contributing factor to sustained development, this aspect will unduly create environmental conflict (Pfaff, Vélez, Ramos, Molina. 2015).

To understand the impact of the current study in association to the results, findings from an adjacent study with regards to a venture success was divided into that of individual and environmental factors (Sequeira, Gibbs, & Juma, 2016). In understanding this impact, it stipulated that individual factors such as entrepreneurial skill, government programs stimulated the need for business success. When looking at the environmental factors, financial support, access to education and government ensured the success of the venture.

In bringing it back to this study, results identified that resource constraints associated to individual and environmental factors as stipulated by Sequeira et al. (2016) study did not result in small-scale farmer venture success. From the current study it is evident that for the efficiency within the current small-scale farming operations to prosper, these constraints cannot be constrained nor be non-existent. An improvement of the stipulated constraints will need to be provided for within the short-term to enhance operational efficiency to generate higher margins.

The dependency on resources within the small-scale farming sector plays a significant role. Without resources, the operational activities completed on each small-scale farm will not yield the results government is looking for. Due to the inequality of the past, the directive of government today is to ensure redistribution of land for productivity to entail (Lahiff & Cousins, 2005). In creating this equality within South Africa, the government needs to ensure measures are put in place that will not affect the small-scale farmers directly.

As stipulated, from a resource-based view; this describes resources as being the key to superior performance. The prevailing attributes ensure a competitive advantage is obtained.

Resource-based view encompasses the elements around resource scarcity and resource dependency. Resource scarcity plays a significant role within the small-scale farming sector. The dependency on physical resources has a significant impact on operational efficiency. Water as key physical resource within small-scale farming is ultimately the most critical resource the business relies on today as well as in the future (Mancosu, Snyder, Kyriakakis & Spano, 2015).

This scarcity creates business pressure within the sector to ultimately engage in business model innovation (this will be covered in sub-research question 2). The resource based-view thus ultimately pushes organizations to leverage their internal resources, this will provide the sustainable competitive advantage in ensuring an efficient operation.

In contrast, resource dependency theory looks to identify which certain resources are critical to ensure business success (Sequeira, Gibbs & Juma, 2016). Within this stipulated research, based on the selected sample population in the pre-defined geographic locations, it was questioned to determine if the same certain resource was evident as being the predominate constraint.

In the results, it was ascertained that the same resource constraint was evident between all the cases as well as the contextual constraint.

Table 10: Results Summary of Resource based-view

Resource	Contextual
Physical Constraints	Government Involvement
Financial Constraints	Stakeholder Involvement
Technological Constraints	Entrepreneur Personal Development and Apartheid Legacy

With small-scale farmers still demonstrating a high dependency on these constraints based on the importance of the resource for end production, finding an alternate source and the

ownership of the resource, this continue to be a hurdle for the sector (Kalaitzi, Matopoulos, Bourlakis & Tate, 2018).

The dependency on these critical resources has ensured the operational efficiency within the small-scale farming sector will remain impeded. The behaviour of the business is shaped by the dependency of key resources within the surrounding environment. The significant dependence on the resource constraints as well as contextual constraints will ultimately have a negative impact on operational efficiency.

The need for entrepreneurs within the small-scale farming sector to develop their own core capabilities and thus become less reliant on the current resources within the environment. Looking at the concept around entrepreneurship theory, this is ultimately the formulation of relationships, understanding the underlying principals which will help in predicting the activity (Kurarko, Morris & Schindehutte, 2015). Entrepreneurship is associated to small or new business, while driving focus on discovery and exploitation of profitable opportunities (Shane & Venkataraman, 2000).

With small-scale farmers applying this mindset, the establishment of key strategic partnerships with government to ultimately reduce the contextual constraint. Small-scale farmers will need to position themselves as value drivers that government sees as an economic vehicle to drive the economy growth, thus impacting the unemployment rate and poverty bracket in a positive manner. Ensuring government is integrated into the business as a stakeholder, this will ultimately reduce the dependency from the small-scale farmers perspective.

The required resources (financial) as well as contextual (government involvement) will thus become non-critical resources. In contrast to this positive outlook, the dependency demonstrated by small-scale farmers on government is to ensure government controls the impower balance, ensuring their direct influence is present in the operations of the organization (Coupet & McWilliams, 2017).

In facilitating improved operational efficiency, small-scale farmers will need to leverage current internal resources. The resource and contextual constraints will ultimately be a significant obstacle for small-scale farmers in the short-term. Being able to turn the current resources in in key attributes will then provide small-scale farmers with an improved operational efficiency within the agriculture sector.

6.3 Sub-question 1: Results Discussion

In the previous chapter, it was documented that four key areas highlighted by small-scale farmers and industry experts as being critical for farming operations to succeed. These are shown below (Figure 21).

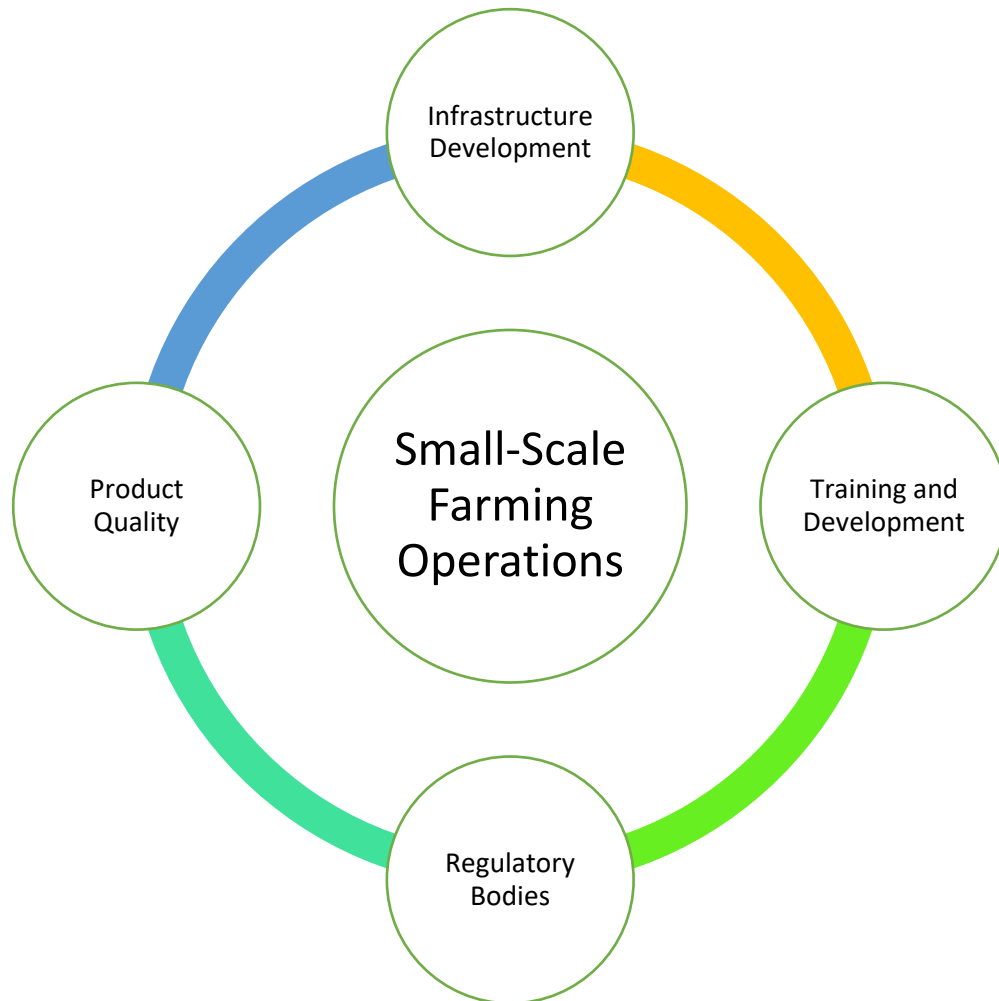


Figure 21: Key components for small-scale farming operations

In linking this to theory, this is the initial formulation of a supply chain for small-scale farmers to facilitate farming operations. The involvement of participants within the industry that contribute a specific function in order to meet the stipulated demand, be it customer or another business (Syntetos, Babai, Boylan, Kolassa, Nikolopoulos, 2016).

The importance surrounding this concept is that respective participants involved in this operational supply chain can be an entire organization or a unit within the respective organization. The respective units ultimately are combined within the decision-making unit

process (Syntetos, Babai, Boylan, Kolassa, Nikolopoulos, 2016). The current network will adapt within the system to self-organize itself (Carter, Rogers & Choi, 2015). Supply chains are full of uncertainty. Some uncertainties like inconsistencies in quality or delivery dates originates under a supply chain member's own roof. Other external sources of uncertainties are for example the variability in the timing and quality of incoming materials or even the quantities that customers demand. A member within the supply chain can also face an uncertainty if they are not receiving the correct information at any point within the line of supply, including lack of information from suppliers and customers. The lack of information would constrain this member to perform optimally within their required responsibilities (Flynn, Koufteros & Lu, 2016).

In relating this to the study, the evidence provided from small-scale farmers and industry experts. These respective components identified for successful operational success shows alignment between that of small-scale farmers and industry experts. With alignment achieved between small-scale farmers and industry experts, this will ensure the respective components which add to the resource and contextual constraint are resolved timeously.

6.4 Sub-question 2: Results Discussion

Before business model innovation (BMI) can be considered within the small-scale farming sector and its impact on operational activity and the supply chain, current business models need to be reviewed and tested for current efficiency and effectiveness (Teece, 2010; Zott and Amit, 2010). Current business models need to provide the business with a platform from which significant value can be derived for the client (Teece, 2010). The current systems of organizations operate in an open system; turbulence, risk and uncertainty are predominant, business models create stability while ensuring flexibility to achieve defined efficiency targets (Carayannis, Sindakis & Walter, 2015).

The concept of organizational flexibility was developed to enhance the offering of strategic management. Providing organizations with an alternative strategic element within their strategy (Volberda, 1997). Volberda (1996) claims that flexibility provides an advantageous element to any organization only when reinforced with the element of stability. Steady-state flexibility encompasses procedures of a static nature that will enhance the optimization in relation to performance levels of increased throughput when current throughput remains consistent over time (Volberda, 1996).

Verdu-Jover, Llorebs-Montes & Garcia-Morales (2005) argue that organizations fail in the initial step of innovation (change management) due to the inflexible as well as rigid vision of themselves. An identifiable void exists within the current innovative models, these models do not consider constructs associated with the construct of flexibility.

Abbott and Banerji (2003) indicate that with increased volatility within the external environment, the organization will need to ensure greater flexibility that will permit them to respond to the emerging conditions immediately.

In contrast, the use of BMI would need to be first established within the sector. An understanding of BMI will be possible within the small-scale farming sector. The associated elements in relations to BMI, the challenges and enablers would need to be compared to that of a conceptual framework. This ensures that the innovation elements derived for the sector in fact contribute to BMI. The obtained results from the comparison will need to be considered in the development of the new business models. The respective concepts obtained must be shared with the new entrants to the small-scale farming sector. The ability of the organization to encompass flexibility within BMI will result in innovative solutions being accepted and implemented.

With growth being regarded as one of the key elements in organizations, there needs to be an efficiency in the flexibility which allows for the capabilities of the organization to explore new ventures and manage the environment change. Managing the external pressures will be pivotal to ensuring long-term sustainability. This model ensures management has the required skills to develop the capabilities that will enhance flexibility as well as ensure the firm has an adequate organizational design to utilize the capabilities (Volberda, 1996).

In relation to the current study, BMI levels with regards to the results indicate that BMI is hardly used. The identifiable factors which have eluded to the significant low levels of BMI are the lack of current business model designs, innovation within the market is limited as respondents do not facilitate the use of technology as well as the continuous demand by the business cases to receive continued support from the government and respective institutions.

When business looks to enhance the current usage of BMI within the small-scale farming operational and supply chain network, there needs to be an investigation as to why the current levels of BMI are extremely low. Limited evidence within the sample identifies BMI. Two of the five cases have currently shown innovating with regards to development of new, unique concepts in their current business models.

As mentioned above, a respective frame work will be needed to conduct the comparison in association to business model innovation (see Figure 22 below). This framework is taken from Wirtz and Daiser (2017). Within the framework, it is stipulated what elements are required to be present in a business model. Once detailed in terms of elements, this will provide the intensity in association to each element.

Comparing the BMI elements found within the small-scale farming operational supply chain with regards to the respective cases, this was overlaid on the conceptual framework of Wirtz and Daiser (2017) to ascertain the BMI intensity of each case. This can be seen in Figure 23 below.

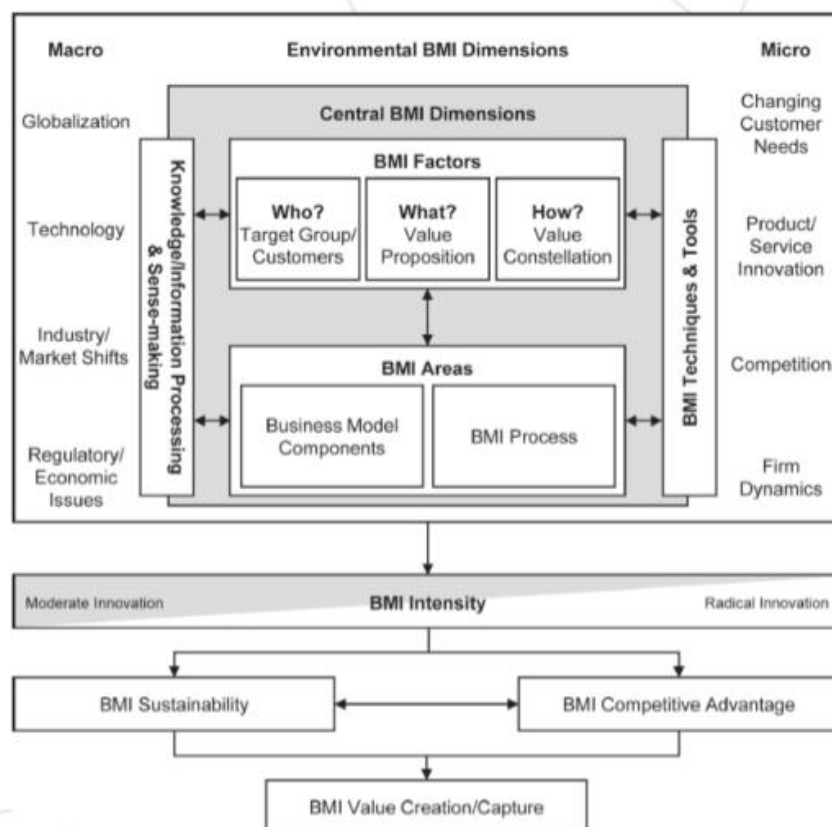


Figure 22: Integrative conceptual BMI framework (Wirtz & Daiser, 2017, p.25).

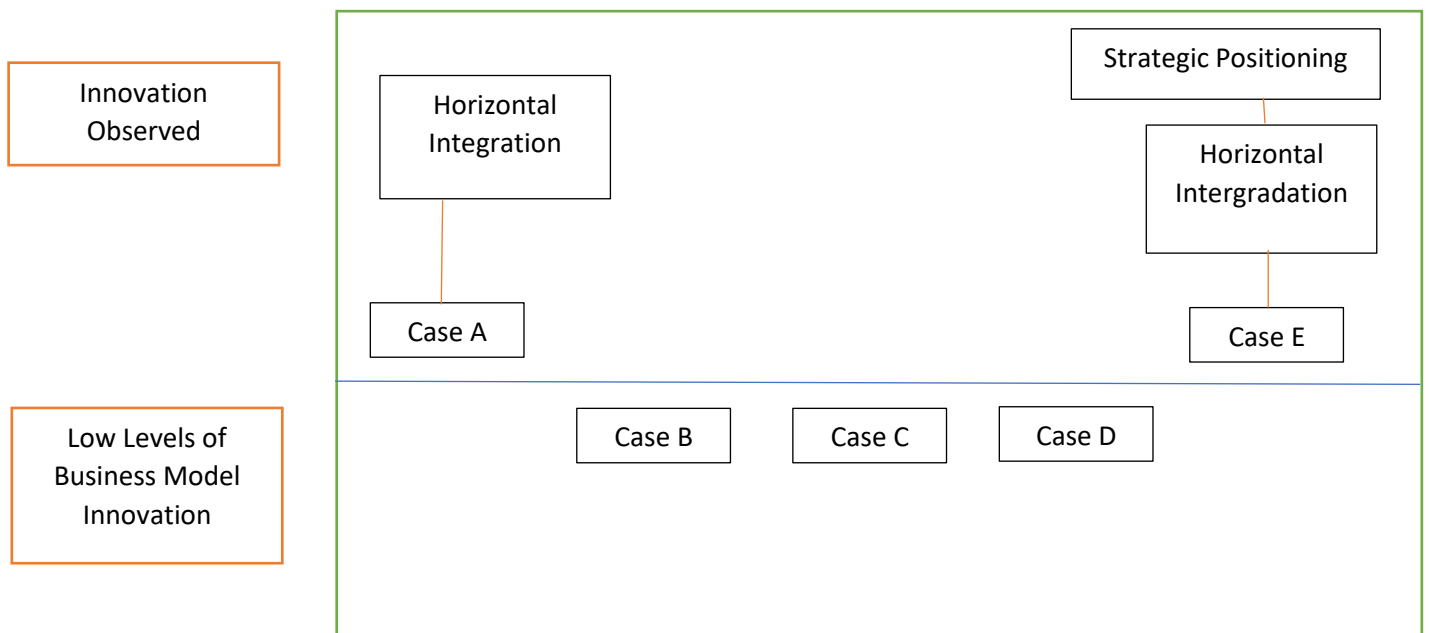


Figure 23: BMI elements located with the small-scale farming operation supply chain

As seen above in Figure 23, the respective cases were documented within the conceptual framework in association to the small-scale farming operational supply chain network. No cases were in the radical innovation section, but two cases were classified to engage in moderate innovation.

With respect to the results identified, case B, case C and case D displayed significantly low levels of innovation with the business models while case A and case E sit on the moderate innovation engagement. The intensity of case A and case E are still low due to only engaging with limited innovation to assist in business model innovation. All other cases in respect to intensity are zero.

In providing context, when full radical innovation is achieved by a case, this would lead to increase value creation or the capture of a market. This ideally would be the aim for all cases within the small-scale farming operation supply chain as it would lead to increase revenue generation from produce been sold and thus be significantly affected by a resourced based-view where resource/contextual constraints are challenges for the business.

With enablers and challenges been highlighted in the previous chapter, this was identified in terms of having a positive or negative impact on the business model innovation. Challenges in association to training and development, finance, experience and macro-economic factors resulted Cases B, C, D not engaging in business model innovation. The respective constraints

identified for these cases are entry level factors. The business is not able to move past the sliding scale of intensity until the respective components are resolved. Once resolved, horizontal integration is possible for these respective cases. Cases A and E have overcome the respective challenges faced by Cases B,C, and D. The respective owners of Case A and E have converted these challenges into becoming enablers. Case A has invested in “smart packaging”, which allowed for controlled quantity per bin (see figure 5) and reduced the number of damaged produces drastically. This horizontal integration has increased the number in terms of products available for sale to local markets.

Case E, currently running a fully automated hydroponics small-scale farming operational supply chain. Not having the same resource and contextual constraints as Cases A,B,C and D has allowed for this owner to be mobile in terms of location. Case E places his small-scale farm in central locations in respect to his clients. This strategic position has enabled the owner to provide a base for regulation bodies to conduct continuous audits on all respective produce. The horizontal integration of the hydroponic water system allows for resource scarcity of water to not be a resource constraint. The up-side of the water system ensures crops are fed the exact resource quantity which results in a greater yield per crop planted. With this strategic position, the owner can sell crops at a unit cost cheaper than competitors due to production costs being significantly cheaper. The component intensity relating to BMI is far greater than that of the other cases. This increased intensity will deliver greater value add for the respective clients as well as ensure long-term sustainability.

In analysing the respective constraints that will affect business model innovation(BMI) and business innovation, this becomes context specific per case. Entry level small-scale farmers will not be able apply the same BMI intensity compared to the small-scale farmers who have been in the sector for numerous years. The benefit derived from this process is that emerging small-scale farmers can ‘leap-frog’ the chasm. The data transfer and training and development these respective farmers can obtain will result in the learning curve been reduced drastically. Reduced learning curve results in increased quality of quantity produce, significantly higher margins obtained thus ensuring resource and contextual constraints are mitigated within the short-term.

6.5 Conclusion

The objective of this chapter was to present the results and discuss them in relation to the current study. The obtained findings of the study were analysed, then compared to other respective cases within the sample as well as contrasted to specified literature. Business model innovation, supply chain theory and entrepreneurial theory were identified as the literature in answering the stipulated research question and the two sub-research questions.

In understanding and expanding on the resource-based view, entrepreneurship in this context has now included additional resources that must be incorporated into the thought process of business owners when operating a business in the small-scale farming operation supply chain (Barney, Wright, Ketchen, 2001).

Literature provide insight that through entrepreneurship theory, elements of entrepreneurial bricolage would be evident in resource-constrained environments. It was evident from the study that each respective small-scale farmer regardless of size performed his own operational activities in isolation from other small-scale farmers. The exchanging of information only occurred during symposiums held by industry experts on a quarterly basis. This study revealed that small-scale farmers conducted resource-seeking behaviour in their own capacity due to the numerous resource and contextual constraints identified.

Within the study, an impact associated to the specific components identified by small-scale farmers and industry experts was investigated. The analysis revealed that four constraints were given the same high priority by small-scale farmer and experts in terms impacting the efficiency of the operational activities. These components were linked to that of a basic supply chain, which will construct itself to the stipulated context (Carter, Rogers & Choi, 2015). The basis of this supply chain was due to the single aspects being able to function as a single component or be an integral part of the entire businesses supply chain. (Flynn, Koufteros & Lu, 2016).

In summation of the last research question, this looked at the impact of business model innovation (BMI) in terms of the current intensity applied by all the respective cases. It was noted that a conceptual framework was used from Wirtz and Daiser (2017). This provided a comparison of components in terms of the degree of innovation within the business model. Challenges and enablers were identified within the small-scale farming operational supply chain. An association was drawn that if negative, this would directly impact the business

opportunities within the market. The inverse was noted when enablers created a positive outcome.

Chapter 7: Conclusion and Recommendations

7.1 Introduction

The study looked to garner insights into the impact of resource and contextual constraints within the supply chain of small-scale farmers. Understanding how these entrepreneurs of the agriculture sector apply business models within their organization and to what extent is business model innovation evident to assist the small-scale farmers with these constraints. Chapter one highlighted the significant negative factors which affect the macro-economic development of an economy like South Africa. In contrast, Brière, Tremblay and Daou (2014) commented that with entrepreneurship activity, the economy of a country can be improved (Brière, Tremblay & Daou, 2014).

These macro-economic contextual constraints are burdened within that of the informal economy of South Africa. Teece (2010), Zott and Amit (2010), Beneke, Curran, Forsyth & Lamb (2011) and Adner (2016) stipulate that these contextual constraints and challenges are located with the informal economy, all highlighting where current supply chains are described as being inefficient and there is a lack of business model innovation. There a significant contrast to the supply chain found within the formal sector.

Supply chains within the formal sector encompass a network of stakeholders such as producers, suppliers, agents, industry experts and administrators who co-exist to create an efficient ecosystem where the supply chain creates significant value for the consumer (Adner, 2016). With respect to the small-scale farmers supply chain, this service delivery is not available as numerous inefficiencies plague this process. Low development with regards to business model innovation as well as business innovation is done for these entrepreneurs that will enhance their effectiveness in terms of supplying produce that will be purchased in local and export markets.

In understanding the contextual constraints of this sector, small-scale farmers demonstrate entrepreneurial bricolage in association to the performance, innovation and growth of their business (Linna, 2013; Keupp & Gassman, 2013). Guo, Zhang, & Gao (2018) and Kickul, Griffiths, Bacq, & Garud (2018) argue against this form of radical innovation for business of small-scale farmers within this informal sector to create sustainability. This discrepancy within the literature associated to entrepreneurs and the improved efficiency within the supply chain is yet to be fully explored. This study will look at how contextual constraints within the agriculture sector associated to supply chain efficiency can be improved through business

model innovation as well as business innovation. Isolating these constraints within the supply chain can enhance the organisations performance to remain stable and sustainable for long-term profit generation.

7.2 Principal Findings

In completing the study, the findings have ratified what was set out to be achieved which was stated in the research question compiled in Chapter 3. The lack of resources, contextual constraints, land redistribution, an inefficient supply chain as well not being flexible to market conditions have impeded small-scale farmers in South Africa. The lack of business model innovation as well as business innovation through technology has severely hindered business growth for these entrepreneurs within the agriculture sector.

The sector is marred with contextual constraints which hinder the developmental business growth needed by small-scale farmers to remain stable within the short-term and sustainable in the long-term. The findings have been categorized into five sectors that highlight the significant struggle these small-scale farmers face daily.

7.2.1 Resource Constraints

Tietenberg & Lewis (2016) comment that in terms of efficient allocation of resources this will not lead to the sustainable criterion being achieved. Small-scale farmers today do not own a sustainable portion of land to ensure efficient production in order to generate significant volumes to supply local as well as export markets. For production to be sustainable, small-scale farmers are faced with South Africa's current water shortages. The resource ultimately is the most critical resource for the organization today and in the future (Mancosu, Snyder, Kyriakakis & Spano, 2015). The availability and accessibility of water has been marked as a significant factor which can constrain the development of crop production (Mancosu, Snyder, Kyriakakis, Spano, 2015).

A. Mbedzi (personal communication, November 5, 2019) commented that small-scale farmers today are given water rights in association the size of their land allocation. In the event the small-scale farmer requires additional water, he/she needs to apply at the Department of Water for an increase on your allotted allocated water rights. The detrimental consequence associated to this process in terms of water scarcity during a drought period will create significant competition between that of the agricultural businesses who contribute to the

economy as well other sectors within the economy who rely on water for production (manufacturing) (Mancosu, Snyder, Kyriakakis, Spano, 2015).

In analysing the small-scale farmers based on a resource-based view, it helped ascertain which certain resources were critical to ensure venture success (Sequeira, Gibbs & Juma, 2016). In relation to entrepreneurial bricolage, little to no evidence was identified as being a source of innovation within the contextual constrained supply chain.

In mitigating the demand on resources, little work has been done to understand the specific resources used in relation to current small-scale farmers supply chain (Matopoulos, Barros, & Van der Vorst, 2015). High levels of ignorance are demonstrated in terms of understanding the impact of availability of natural resources within the current supply chain as being a risk in the future. Resource accessibility within the supply chain is not evident amongst small-scale farmers in terms of providing an overall competitive advantage (Matopoulos, Barros, & Van der Vorst, 2015). Small-scale farmers need to be more resource aware in terms of the changing environment which provides the required resource. Current resources being made use of need to be allocated in a sparing and responsive manner. This will ensure crop production is not hindered due to the resource not being available (Matopoulos, Barros, & Van der Vorst, 2015).

7.2.2 Specific Contextual Constraints

In understanding the associated specific contextual constraints of the small-scale farmers, the need to understand their mental models based on behavioural decision-making process when engaging with the world around them (Vuillot, Coron, Calatayud, Sirami, Mathevet & Gibon, 2016). In identifying the associated 'wicked constraints' faced by small-scale farmers within their environment, the sharing of mental models between stakeholders was not evident. This process of highlighting and sharing stipulated constraints is a way to induce changes of current policy with regards to making it more efficient for the entrepreneurs (Vuillot et al., 2016). Mental models will thus influence the perception of people and ultimately how they conduct their practices.

A variety of contextual constraints have been confirmed in relation to small-scale farmers. The first constraint is with regards to the occupied land. Land distributed by government is leased to the entrepreneur on a long-term lease. With the small scale-farmer not owning the land, this indirectly creates a constraint within the financial sector. No financial institution will sign-off on any loan amount requested by small-scale farmers due to this. The permission to occupy

(PTO) supplied by Government to small-scale farmers is not recognized by financial institutions within South Africa (A. Mbedzi, personal communication, November 5, 2019).

With development of small-scale farmers being raised, these entrepreneurs have indicated that the current support structures supplied by Government in terms of training and development is only present during the initial quarter of the farm being developed. Post the entrepreneur acquiring the farm, support received from Government is drastically reduced. Small-scale farmers indicated that this support should be on-going throughout the initial phase of one production crop cycle to ensure profitability on yield.

With finance being a significant constraint for small-scale farmers, this has seen a drastic impact on the development of infrastructure within this sector. If Government has not allocated the required funds for infrastructure development, these small-scale farmers do not invest their own funds in automating their operations. The farmers rely on surrounding commercial farms to sort and process the commodities for sale to local or export markets.

In addition to finance not being supplied from financial institutions within South Africa, the low margins small-scale farmers achieve on the sale of their products; small-scale farmers need to meet a set standard stipulated by 'GLOBALG.A.P' in order to export their commodities to export markets. This financial cost associated to meet this international standard ranges from R 40 000.00 to R 80 000.00. This is all dependent on which market the small-scale farmer would like to export his produce too (A. Mbedzi, personal communication, November 5, 2019).



Figure 24: Global G.A.P certification

7.2.3 Supply Chain Components of Small-Scale Farmers

It has been derived from literature outside of this sector that elements associated to formal supply chains encompass strong strategic alliances where supply chain management and information modelling allow for innovation to emerge which will manage defined complexities throughout the duration of the organization (Lönngren, Rosenkranz & Kolbe, 2010; Segerstedt & Olofsson, 2010; Papadonikolaki, Verbraeck & Wamelink, 2017). In analysing the results from this sector, it is evident that the supply chains associated to small-scale farmers constitute as being one that is simple and traditional. This broader supply chain concept aligns with the views of Petersen, Charman & Kroll (2018).

In adding a principal finding associated to this sector, the evidence of cooperation that was discovered between that of the informal small-scale farmers supply chain and that of the commercial farmers supply chain in Gauteng. Symposiums are held annually for farmers from both sectors to attend in understanding the dynamics of each sector. Areas of commonality are discussed to ascertain if the current process applied is the most efficient and effective. Areas of difference are debated in terms of inefficiency. This is thus done to provide the respective informal/formal sector an opportunity to make use of the respective supply chain elements to improve on overall performance. This shared resource-based view promotes inclusion of both sectors while challenging the views in terms of the dynamics associated to formal and informal sectors within a developing economy (Srivastava, 2006).

7.2.4 Low Business Model and Business Innovation

Constraints associated to the lack of resources as well as context related challenges has highlighted that the supply chain of small-scale farmers functions within a significantly constrained business environment. In analysing the data generated, it is evident that only a select few small-scale farmers engage in business model innovation. This innovation has not created an extended competitive advantage through true value creation (Wirtz & Daiser, 2017).

With these small-scale farmers displaying some element associated to business model innovation sustainability, the supply chain of this sector is neither sustainable or efficient. In understanding the associated constraints for innovation within the business model, the below items were identified:

1. Formalised business model designs do not exist
2. Constraints associated to knowledge resources surrounding growth of crops
3. Current used business models do not have any form of flexibility

7.2.5 Lack of Flexibility

With the environment consistently evolving in each economy in relation to the specific demand for food, modern market development has created this rapid change overnight. Small-scale farmers are faced with significant challenges regarding meeting this demand due to the lack of flexibility. With significantly high investment in stipulated crops obtained through sub-standard market research and membership fees for export, these farmers are not able to pivot to meet the ever-changing demand. This promotes a negative environment for small-scale farmers in terms of implementing innovation and creating efficiency within the supply chain.

Elements associated to favour flexibility (technology) created an environment which enabled business performance in terms of growth and improved the perceptions of small-scale farmers relating to innovation within the business model. In detailing the constraints within the sector and supply chain, this allowed for a business model to be developed that can be used by the entrepreneurs of the small-scale farming sector to improve current business performance as well as improve the efficiency within the current supply chain.

7.2.6 Entrepreneurs: Small-scale farmers

Through the current study, supply chains associated to small-scale farmers have been investigated to understand the complexities associated to the business environment they operate in. Looking at the current contextual constraints which impede business model innovation through affecting efficiency and sustainability.

With the development of a proposed business model canvas for small-scale farmers through innovation of the current business model, it will create structure within the supply chain to develop a sustained competitive advantage for the business.

1. Small-scale farmers are faced with a multitude of contextual constraints in relation to required resources, specific sector challenges and required innovation. Documenting these constraints will provide entrepreneurs with relevant information before undertaking a new venture within the small-scale farming sector.
2. Small-scale farmers need to ensure planning is completed prior to the new venture beginning. This will ensure stipulated resource and contextual constraints are managed, thus preventing any inefficiencies within the supply chain.
3. An entrepreneurial orientation will be understood by small-scale farmers before conducting business in any context. This will enhance the decision-making process of farmers to make improved, well-informed decisions which will have a successful impact on the organization.
4. The unrealistic business environment will not dictate the outcome of the new venture for small-scale farmers as learning can be drawn from current case innovation.
5. Applying the current learnt elements associated to business model innovation will enhance the development of current organizations within the agriculture sector. Encompassing environmental dimensions surrounding contextual constraints within the model innovation will enhance the innovation and create a sustained competitive advantage.
6. Through understanding the components of the small-scale farming supply chain, the entrepreneur can ultimately create additions to the base foundation within the chain that can drastically improve the efficiency.

7. Small-scale farmers can create an environment that enables their organization and business venture to achieve long-term sustainability.

7.3 Limitations of the Research

Due to the study being focused around a specific context, exploratory research was required to be done. This creates generalisability of results in terms of being limited and should be documented. In addition to the above, the below limitations should also be noted in association to the study:

1. Applied context and language of choice differed to initial language used for interviews. Respondents struggled to articulate responses which has affected the quality of the answers given.
2. Time constraint resulted in research leveraging family member relationship to gain access to predefined sample group.
3. The subjective nature of the qualitative research will attract researcher bias.
4. Ensuring quality of the research, selected geographic location would form the base area of the focus group to ensure contextual influences are unique to the small-scale farmers of that area.
5. White small-scale farmers from the stipulated geographic area are limited, thus resulting in a biased view from one demographic population.

7.4 Suggestions for Future Research

The potential for future research is listed below:

1. A quantitative study can be conducted in terms of the current study. This process can ensure measures of the business model canvas can be quantified in relation to the supply chains of small-scale farmers.
2. The business model canvas can be used in other sectors where a significant divide exists between that of the formal and informal sector. Will the same effectiveness be obtained?
3. Each contextual constraint with the supply chain can be detailed to an exploratory research to understand if this exists in other provinces of South Africa.

4. Exploratory research can be conducted on additional elements within the small-scale farming sector outside of the supply chain that impact business innovation.

7.5 Conclusion

The study highlighted the associated constraints with regards to the supply chain of small-scale farmers located within South Africa. Understanding how these entrepreneurs facilitate operational activities within the business models which are directly impacted by the on-going changing environment. The research has identified currently that current small-scale farming supply chains operate inefficiency. This inefficiency is linked to the lack of flexibility of stakeholders. The current relationship between that of the informal (small-scale farmers) and formal (commercial farmers) sector has shown to add value to the development of inefficient supply chains for long-terms sustainability of this sector to continue, encompassing bot the small-scale farmer and the commercial farmer.

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Appendix A: Interview Procedure Example

Interview Procedure

Name: _____

Start Time: _____

Farm Name: _____

End Time: _____

Title: _____

Date: _____

Dear

Thank you for allowing me to meet with you today and your agreement for this interview to occur. Your input into this research is greatly appreciated in garnering a better understanding of constraints faced by 'small scale farmers'.

The objective of this research is to determine the constraints 'small scale farmers' experience with regards to being sustainable as well as highlight the key constraints in terms of current opportunities, challenges within the supply chain.

The objective for this research is:

- Understand current situational environment of 'small scale farmers'
- Determine the constraints being the biggest deterrent for this sector
- Understand supply chain constraints with respect to inbound and outbound operations
- Perception associated to technological engagement

This research and interview will be facilitated in terms of being exploratory. Please feel free to articulate freely in terms of factors you deem significant. The information provided will remain confidential.

The questions will be divided into 3 sections:

- a) Past sector factors
- b) Current sector factors
- c) Future sector factors

Before the interview commences, please could I ask that you sign the consent form and stipulate your preference in terms of the interview being recorded or not.

Section A: Past Sector Factors (Theme setting)

<u>Introductory question:</u>	<u>Researcher Stimuli:</u>	<u>Respondent Answer:</u>
How did you enter the sector, and tell me about your business?		
What components make up the supply chain of small-scale farmers?		
How is the business financed?		
What were the constraints of small-scale farmers?		

Section B: Current Sector Factors

<u>Introductory question:</u>	<u>Researcher Stimuli:</u>	<u>Respondent Answer:</u>
How do you conduct current market research?	What do you deem important today that the consumer perceives as valuable?	
What are the constraints of small-scale farmers?	Supplier, Capital, Distribution	
What is your current usage of technology and how does it influence your operation?	Are you open to partnerships in your current geographic area?	
What is your view in terms of using technology in your supply chain?	Shared economy, will you be interested in this development? (Renting of assets rather than owner-service fee charged) (emerging farmer environment)	

Section C: Future Sector Factors

<u>Introductory question:</u>	<u>Researcher Stimuli:</u>	<u>Respondent Answer:</u>
What solutions are available to address the constraints of small-scale farmers?		

Are you aware of the current farming practices in developed agricultural sectors?	Exploration of the participants exposure to developed agricultural economies. Example same seed provider, automation and systems analysis	
As a small-scale farmer, are you looking to transition towards commercial farming? How?	Do you see yourself being more involved in the processing element post the farm gate sale? (Obtaining shares in grain feeders)	
What innovation do you perceive is needed for small-scale farmers?	Are you aware of available technology and innovation and your understanding of it?	
Would vertical farming be of interest?	Will authenticity be regarded as a competitive advantage in your perspective?	

Appendix B: Interview Consent Form Example

Interview Consent Form

Small Scale Farmers - Constraints Defining the Sector

Researcher: Ryan London

MBA Student at the Gordon Institute of Business Science, University of Pretoria

I am conducting research into the constraints that impede the functionality of 'small scale farmers' within the agriculture sector. To determine the challenges and opportunities faced in relation to the inbound and outbound logistics of maintaining a sustainable, profitable business.

The interview is expected to last about an hour. The information and insights garnered through the interview will provide me with the required data to better understand the defined constraints of the 'small scale farming' sector. This will provide insight in terms of which constraints have the greatest influence associated to continuous development and what key challenges are faced in the daily operational business cycle.

Your participation is voluntary, and you can withdraw at any time during the process. With regards to the audio recording of the interview, this is also voluntary any you can choose for this to not be recorded. With your permission, I would like to take photographic evidence of commodities produced on your farm. All data obtained will be kept confidential.

If you have any concerns, please contact my supervisor or I. Below are the details:

Ryan London

17393214@mygibs.com

079 982 9405

Beverly Waugh

bev.waugh1@gmail.com

082 880 9303

Participant Name: _____

Signature: _____

Date: _____

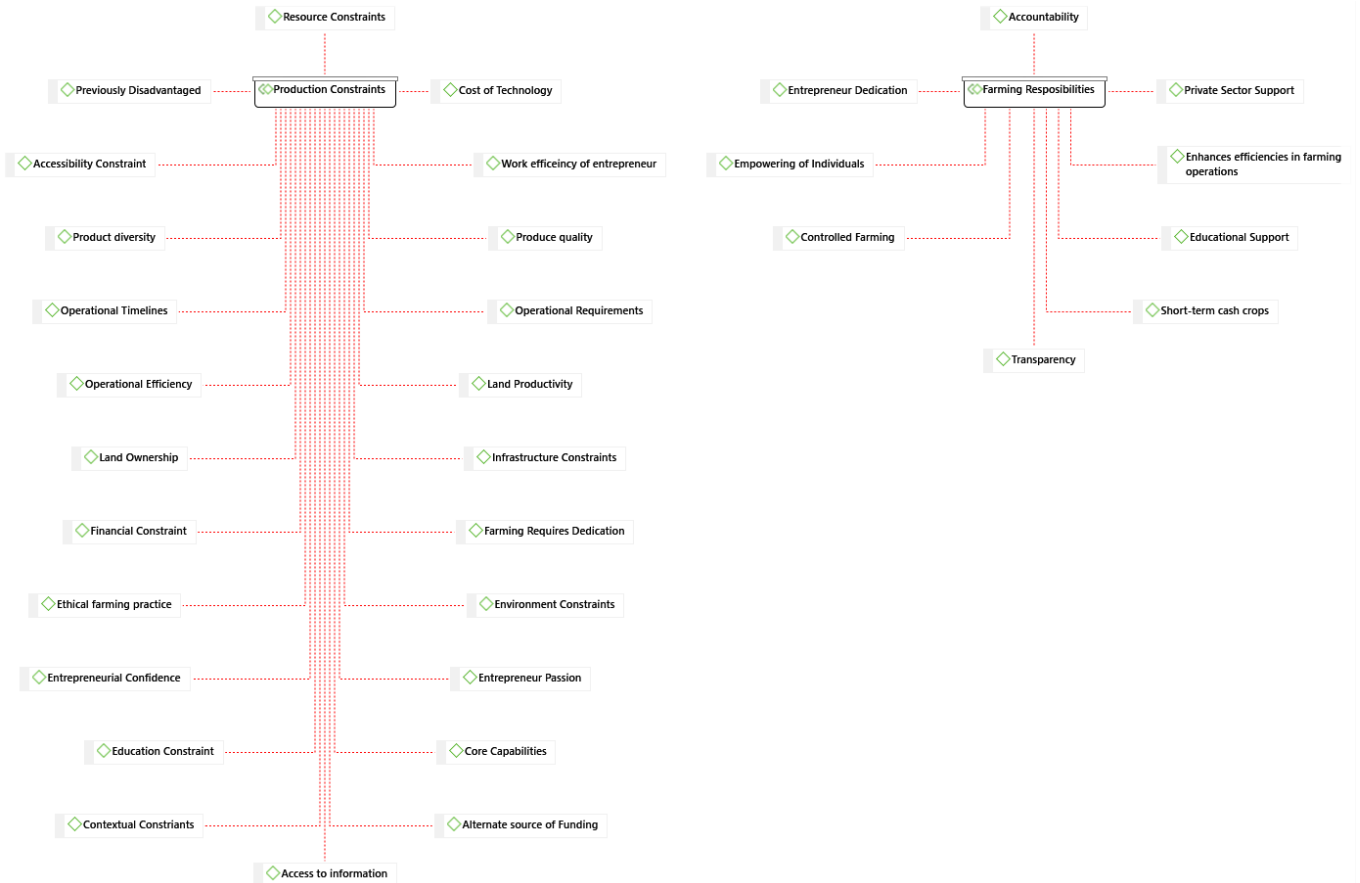
Researcher's Name: _____

Signature: _____

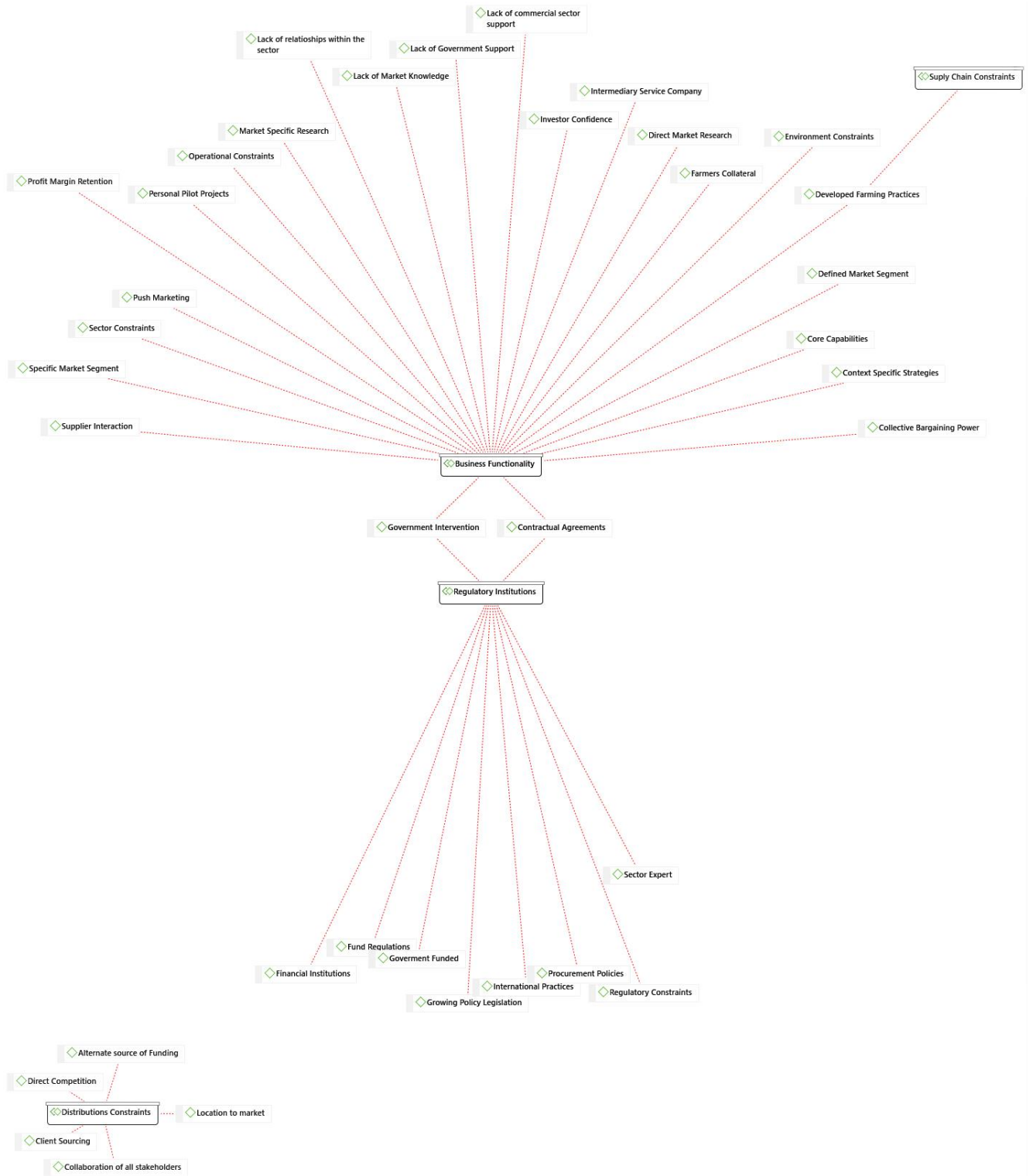
Date: _____

Appendix C: Code Networks

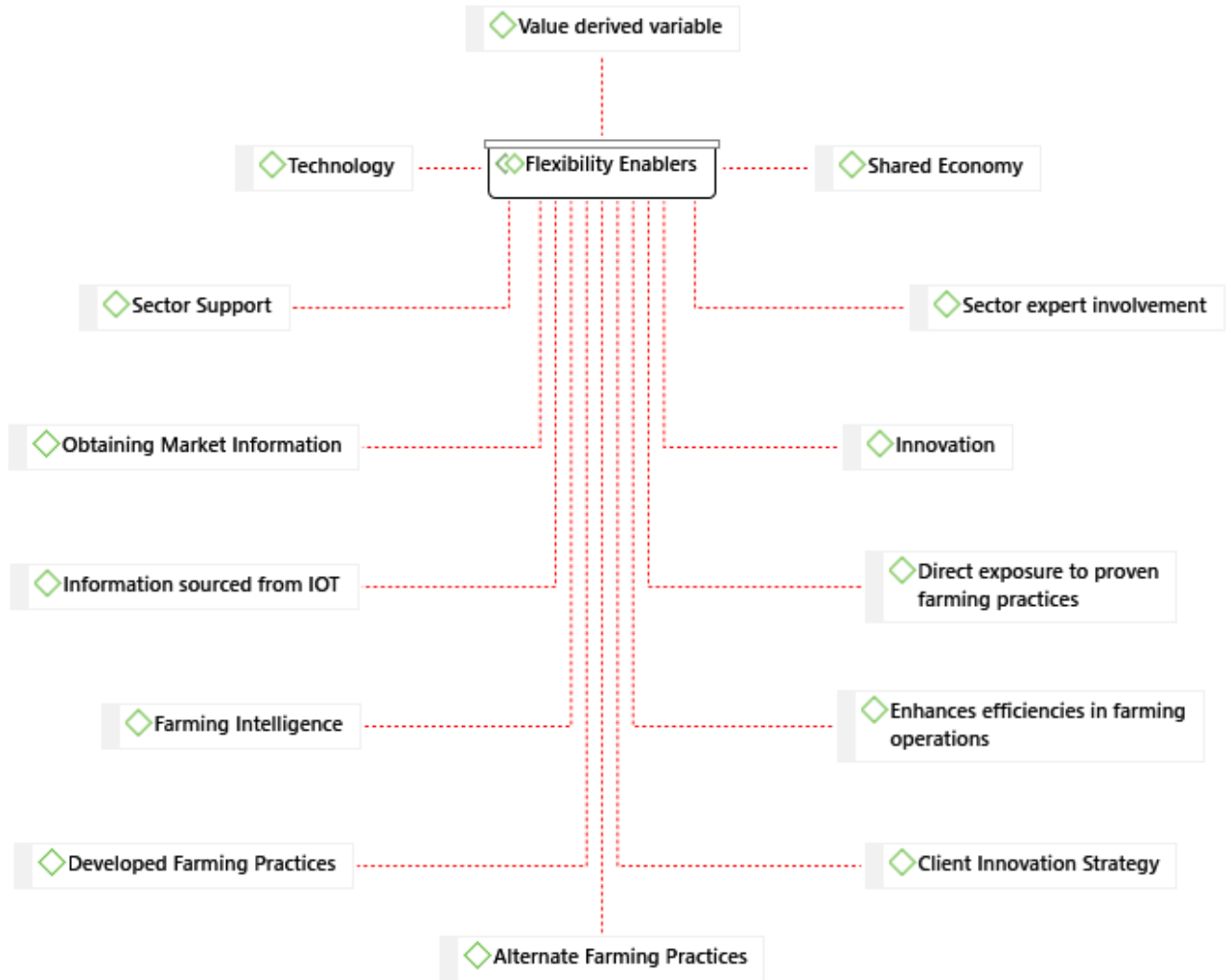
Code Network: Primary Research Question:



Code Network: Sub-question 1:



Code Network: Sub-question 2:



Appendix D: Ethical Clearance Letter

**Gordon
Institute
of Business
Science**
University
of Pretoria

21 August 2019

London Ryan

Dear Ryan

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

Appendix E: Document Code

	Transcription - Andrew Gr=107	Transcription - Hesti Gr=149	Transcription - Isaac Gr=70	Transcription - Pamela Gr=76	Transcription - Victor Gr=95	Transcription - Green City Farmers - AI Farming Group Gr=98	Totals
Business Functionality Gr=115; GS=24	20	25	13	13	26	18	115
Distributions Constraints Gr=40; GS=5	4	15	5	5	3	8	40
Farming Resposibilities Gr=68; GS=9	19	14	7	9	11	8	68
Flexibility Enablers Gr=104; GS=14	16	30	14	9	14	21	104
Production Constraints Gr=260; GS=24	42	68	29	40	43	38	260
Regulatory Institutions Gr=78; GS=10	11	17	3	7	16	24	78
Suply Chain Constraints Gr=39; GS=7	12	7	5	5	4	6	39
Totals	124	176	76	88	117	123	704