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# Strategies for Catalyzing Business Innovation in Small-Scale Agribusinesses in Southern Africa

Golden Mahove  
*Walden University*

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# Walden University

College of Management and Technology

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Golden Mahove

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Walden University  
2019

Abstract

Strategies for Catalyzing Business Innovation in Small-Scale Agribusinesses in Southern  
Africa

by

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MBA, Zimbabwe Open University, 2005

EDP, University of Zimbabwe, 2000

Doctoral Study Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Business Administration

Walden University

April 2019

## Abstract

Agribusiness leaders in emerging economies require effective business model innovation strategies to succeed in closing innovation gaps and increasing market share in the growing smallholder farmers' market. Small agribusiness seed companies in Malawi, Zambia, and Zimbabwe in southern Africa often face the challenge of closing the innovation gap in the smallholders' market, resulting in small-scale seed companies missing 90% of the smallholder farmers' seed market segment. The purpose of this multiple case study was to explore strategies that small agribusiness seed company leaders used to close innovation gaps in smallholders' markets. The conceptual framework was based on the business model innovation(BMI). Ten agribusiness seed company executives selected for their innovations in smallholder markets shared their experiences with and insights into strategies that they successfully designed and implemented in closing innovation gaps in the smallholders' market. Data were collected using semistructured interviews. The data analysis process followed De Massis and Kotlar's 5-phase analysis cycle: from interview responses analysis to member checking and a review of documents on seed businesses and BMI. Three themes emerged from the data analysis: seed production model, product and market differentiation, and value chain partnerships. The implications of this study for social change are that the results could improve food and nutrition security for more than 51 million impoverished smallholder farmers throughout Sub-Saharan Africa.

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## Dedication

I dedicate this doctoral study to my wife Nontsikelelo, our daughters Vimbai, Tshiamo and Grace, and my young brother Dee for believing in me and encouraging me through those long study hours. In particular, I would like to thank my wife for offering me the support and encouragement I needed to pursue and sustain a doctorate in business model innovation. You gave me that extra level of support and confidence to step out and use my doctoral study to pursue consulting work in business model innovation while studying for my doctorate. I always want to thank my parents and in-laws for encouraging me and sharing your concern for the long sleepless nights I dedicated to my doctoral studies.

I would also like to dedicate the study to the several agribusiness seed company participants in Malawi, Zambia, and Zimbabwe who were kind enough to share their business insights as innovators in smallholders' market.

Above all, I would like to thank Jesus for giving me the strength and wisdom I required to embark on this study and think of the study for how it fits into my calling and service to human kind. I would also like to thank Dr. Tich Tanyanyiwa, Ps Nevil Norden, Dr. Chuck Day, my spiritual fathers who gave me encouragement and support to pursue my calling to use business models as a ministry in the marketplace to deliver social impact. Dr. Goitse Perry, thank you for your encouraging support. Lastly but not least, Ps Jeph Mahove, thank you for maintaining the brotherly and spiritual support to me.

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## Section 1: Foundation of the Study

### **Background of the Problem**

The context of the problem that I addressed in this study lies in the role of business model innovation (BMI) strategies that can be used by small-scale agribusiness leaders to gain market share in the vast untapped agribusiness smallholder farmers' seed market segment, which constitutes the largest seed market segment in Sub-Saharan Africa (SSA). The global seed market is valued at US\$54 billion annually (Bonny, 2014; Spielman & Kennedy, 2016). The market splits into the formal and informal segments, with the latter making up US\$15 billion, or 27%, of the global market (Fisher et al., 2015). Despite innovations in plant breeding (Fisher et al., 2015), modern seed technology adoption by smallholder farmers has remained low, with between 80% and 90% of the millions of smallholder farmers in eastern and southern Africa still using low-quality recycled or unimproved seed (Abdi & Nishikawa, 2017; McGuire & Sperling, 2016), which represents a lost business opportunity to seed companies and smallholder farmers alike (AGRA, 2016; Gaffney et al., 2016; McGuire & Sperling, 2016).

Reasons for this low innovation performance among small-scale agribusiness leaders can be located in a number of areas, such as weak product and process innovation (Hullova, Trott, & Simms, 2016), low seed technology turnover (Atlin, Cairns, & Das, 2017; Spielman & Kennedy, 2016), and inappropriate BMI (Howell, van Beers, & Doorn, 2017; Ricciardi, Zardini, & Rossignoli, 2016; Souto, 2016; Teece, 2018). Further exploration of strategies that small agribusiness seed company leaders use to close this innovations gap in smallholders' markets is required.

### **Problem Statement**

Small-scale agribusiness seed company leaders in southern Africa fail to close innovation gaps in their agribusiness seed business models (BMs), which results in loss of market share for their companies (Gaffney et al., 2016). An agribusiness innovation gap in a business model could result in small-scale seed companies missing 90% of the smallholder farmers' seed market segment (McGuire & Sperling, 2016). The general business problem that I addressed in this study is that some small agribusiness seed companies are negatively affected by their leaders' failure to close innovation gaps to capture value in smallholders' seed markets. The specific business problem that I addressed in this study is that some small agribusiness seed company leaders lack strategies to close innovation gaps in smallholders' markets.

### **Purpose Statement**

My purpose in this qualitative multiple case study was to explore strategies that small agribusiness seed company leaders use to close innovation gaps in the smallholder market. The target population consisted of 10 agribusiness seed company chief executives and operations managers of small agribusiness seed companies located in Malawi, Zimbabwe, and Zambia, in southern Africa, whose primary markets are smallholder farmers. The leaders of these companies have demonstrated success in implementing strategies to close the innovation gap. The implications for social change are that the results of this study may offer improved seeds and food security for more than 51 million impoverished smallholder farmers throughout SSA.

### **Nature of the Study**

I chose a qualitative methodology for this study. Unlike quantitative and mixed methods, using the qualitative method enables a nonlinear exploration of a study's central research question. Qualitative and contextual analyses of phenomena require more in-depth and focused attention to strategies driving change. Cross-sectional case study analysis can provide detailed phenomena analysis in a detailed manner (Yin, 2018). I did not select the quantitative method because that research methodology is used to examine relationships or differences among variables by testing hypotheses. In addition, quantitative methods do not enable researchers to consider the contexts of participants' feelings, experiences, observations, and relevant documentation (Myers, 2013). I did not select the mixed-method research approach because it is a combination of both qualitative and quantitative methods. My focus was primarily exploratory and not testing hypotheses (Larkin, Begley, & Devane, 2014).

To address the purpose of this study, I considered case study, phenomenological, and ethnographic research designs. Using the phenomenological design enables the researcher to explore aspects surrounding a specific phenomenon and participants' lived experience (Marshall & Rossman, 2016). The phenomenological design was unsuitable because my study was not about the meanings of participants' lived experiences. The ethnographic research design is primarily about the exploration of the beliefs and behaviors of culture-sharing groups (Marshall & Rossman, 2016). I did not want to focus on characterizing a culture as it pertains to the beliefs and behaviors of people; therefore, I did not select an ethnographic design for my study.

The research design that I selected for my study was a multiple descriptive case study. Using a multiple descriptive case study enables flexibility and adaptability, more so than other designs and enables analysis of a situation through picture and words as opposed to numbers (Merriam, 2014; Yin, 2018). Applying case study design principles enables researchers to explore more deeply into the unit of analysis (Yin, 2018). I used the case study design for flexibility, adaptability, and an in-depth exploration of the case. Yin (2018) stated that with unique cases, the researcher can derive comprehensive findings through a thorough study. Therefore, the qualitative method and multiple case study design was suitable to promote an in-depth exploration of strategies that small agribusiness seed companies in Zimbabwe, Zambia, and Malawi, in southern Africa, used to close the innovation gap.

### **Research Question**

What strategies do small agribusiness seed company leaders use to close innovation gaps in smallholders' markets?

### **Interview Questions**

1. What is your company background and what motivated you to start your seed company focusing on smallholders' markets?
2. What strategies are you using to close your company's innovation gap in smallholders' markets?
3. What product and service innovations were introduced in your company over the past couple of years as a result of your company's strategies?
4. How did you strategize to undertake each of these product and service innovations?

5. What strategies did you employ to grow market share in smallholders' markets?
6. What, if any, are your value chain partnership strategies for the development and delivery of product and service innovations to smallholders' markets?
7. How do you measure the effectiveness of your company's strategies for closing innovation gaps in serving the smallholders' markets?
8. What additional information would you like to share about your company's strategies to close the innovation gap in smallholders' markets?

### **Conceptual Framework**

The conceptual framework that I used for this study was the BMI model. Amit and Zott developed the BMI in 2001 (Amit & Zott, 2001; Morris, Schindehutte, & Allen, 2003). The BMI model is meant to enable practitioners and researchers to “design, describe, categorize, critique and analyze a business model” (Morris et al., 2003, p. 734) for any company, as an adaptation of Schumpeter's (1942) entrepreneurship research. The BMI model is premised on using six core elements for analyzing any BM. The six components are (a) offering: how to create value, (b) customer: for whom the business creates value, (c) internal capability factors: the business' source of competence, (d) competitive strategy factors- the business' competitive positioning, (e) economic factors: how the business makes money, and (f) personal or investor factors: the time, scope and growth ambitions of the entrepreneur (Morris et al., 2003). The efficacy of the six core elements should be analyzed at foundational, proprietary, and rules levels.

Foundational level refers to the tenets of any BM that have to be in place in any business covering product or service offerings, market influences, internal capability



features, competitive strategy, and economic and personal features. Proprietary level deals with the activities undertaken by the business leaders to create a unique set of combinations of the foundational level features. Morris et al. (2003) posited that the BMI is applied to develop unique strategies some of which can even be patented as unique intellectual properties. At the rules level, entrepreneurs establish guiding principles to inform how to execute BMIs. These BMIs become the company's way of doing business, guiding the value equation protection practices of the business. After verifying the BMI model's relevance, I used it as a useful basis for understanding the strategies used by business leaders of small-scale agribusiness seed companies to close the business innovation gap in smallholder farmers' market segments in Malawi, Zambia, and Zimbabwe.

### **Operational Definitions**

This section includes the definition of technical terms used in this study to help provide the reader with necessary subject matter and contextual meanings.

**Adoption rate:** The pace at which smallholder farmers take up productivity-enhancing technologies such as modern seed varieties (de Janvry, Macours & Sadoulet, 2017).

**Business model:** The firm's activities to create, deliver, and capture value through its transaction system architecture and the firm's value chain partners (Gronum, Steen, & Verreyne, 2016).

**Business model innovation:** The practice of disrupting or substantially altering an existing BM to improve a firm's customer reach and scale to capture market share

profitably and improve overall business performance (Taran, Nielsen, Montemari, Thomsen, & Paolone, 2016).

**Innovation diffusion:** The process through, which new innovations are transmitted to target customers for adoption through different channels (Mannan, Nordin, Rafik-Galea, & Rizal, 2017).

**Innovation ecosystem:** A business ecosystem where networks of businesses and other organizations such as universities and research entities come together to gain competitive advantage through technological innovation (Xu, Wu, Minshall, & Zhou, 2017).

**Innovation gap:** The difference between a firm's BM and what value the firm creates for and extracts from its customers. It can also represent the gap between the latecomer firms and frontier firms (Kong, Zhou, Liu, & Xue, 2017; Sjodin et al., 2016).

**Poundability:** The ease with which a grain is convertible to flour and its grain to flour conversion ratio (Murayama et al., 2017)

**Value capture/extraction:** A description of how and how much value appropriation a company extracts from a customer base as a reward for value created and delivered to the customers (Howell, van Beers, & Doorn, 2017).

**Value drivers:** The components of the dynamic business capabilities that can competitively enhance the total value created and delivered by that business (Taran et al., 2016).

**Value proposition:** The combination of products and services offered to customers by the business for, which the customers are willing and able to pay (Taran et al., 2016).

It includes product and service attributes such as high performance, reliability, durability, design, and availability to customer's needs.

Seed variety turnover: The pace at which modern seed varieties are introduced to replace old seed varieties (Atlin et al., 2017).

Trialability: The extent to which potential customers can experiment with an innovation on a limited time basis before making a purchase decision (Dutta & Omolayole, 2016).

### **Assumptions, Limitations, and Delimitations**

#### **Assumptions**

Assumptions are tacit or explicit beliefs, expectations, or considerations made about how the world works believed to be true, but may or may not be valid (Nkwake & Morrow, 2016). In my study, I worked with selected small-scale agribusiness seed executives, and I assumed that the chosen company executives are representative of the population of small-scale agribusiness seed companies. My second assumption was that all the small-scale seed company executives would be able to speak and understand the English language and understand the questions and honestly answer them. My third assumption was that the seed company executives have the mandate and power to execute BMIs and would be ready and willing to honestly answer the questions posed and not just give what they thought I would like to hear from them as a researcher. My fourth assumption was that closing the innovation gap in small-scale agribusiness companies may require a change in BMs, as well as changes in capabilities, and departing from prevailing agribusiness seed BMs.

## **Limitations**

Research limitations are potential weaknesses that lie outside the researcher's control (Brutus, Aguinis, & Wassmer, 2013). Key limitations that I anticipated in my research study are that, first, not all small-scale agribusiness executives documented their work, which could have a potential limitation regarding my intentions to triangulate my data collection methods. Second, I anticipated that I may have to undertake some follow-up interviews via telephone given the vast geographical spread of the research participants across countries and such interaction may limit my capacity to observe any body language and hence not derive the full benefits of the case study methodology.

## **Delimitations**

Delimitations define the boundary of my research study and are all within the control of the researcher (Yin, 2018). My research study was a multiple case study to explore how small agribusiness executives have applied BMIs. Only small-scale agribusiness executives that have actually applied BMIs were targeted in my research study. Restricting the research study to a few small agribusiness companies may impose a reduction in the number of themes I could potentially develop on innovation gaps.

## **Significance of the Study**

The findings from this research study could contribute to both business practice and social change in agribusiness seed companies and smallholder farming livelihoods in Africa.

## **Contribution to Business Practice**

The results of this study may provide value to the practice of business because some small agribusiness seed company leaders are failing to close the innovation gap in

smallholders' markets (McGuire & Sperling, 2016). Provision of improved empirical evidence on how small agribusiness seed company leaders can close the innovation gap and gain competitiveness in smallholder markets may better inform how investors, donors, and public entities can direct such investments in more productive ways. In addition, the findings from this study may contribute to knowledge on the potential strategies for changing increasing business competitiveness among small agribusiness seed companies in southern Africa through strategies for accelerating product and process innovations.

### **Implications for Social Change**

The implications for positive social change may include the potential to enable small agribusiness seed company leaders to develop and adopt better BMIs. Agriculture is the backbone of African economies (Kansiime & Mastenbroek, 2016). Africa is home to 12% of the global population and will be home to 31% of the global population by 2050 (United Nations, 2016). Smallholder farmers make up 70% of Africa's population and contribute 80% of the food consumed in Africa (AGRA, 2016). The improvement of agribusiness seed companies' BMs could catalyze developing a dormant industry on which many people in Africa derive their livelihoods. Improving the BMIs of agribusiness seed companies may lead to food and nutrition security for African families currently living in poverty.

### **A Review of the Professional and Academic Literature**

The examination of the literature review is by section and theme. I analyzed and synthesized the literature in the context of the conceptual framework discussed within this study. In this review, I examined literature which relates to the success factors for

integration of BMIs (value proposition, value creation, value exchange, and value capture). In addition, I analyzed scholarship on emerging lessons from innovation ecosystems, frugal innovation, buyer-supplier innovation, innovation culture, and innovation diffusion, and how these relate to small agribusiness seed companies.

I started the literature review with an overview of agribusiness seed BMs and seed systems, followed by the concepts of BMI, product and process innovation, open innovation and culture, innovation ecosystems, innovation diffusion, and buyer and supplier innovation. The literature also includes strategies for successful project management for the introduction of new business innovations. It also contains discussion about successful BMI, and seed technology innovation strategies for market growth. Where appropriate, I compared and contrasted various points of view to premise the relevance of this study.

In constructing my literature review, I obtained information through various databases including Business Source Complete, Google Scholar, ProQuest Central, Emerald Management Journals, ABI/INFORM Complete, Science Direct, BMI and seed systems, and Sage Management and Business studies. The search included keywords and phrases such as *BMs*, *BMI*, *innovation strategies*, *sustainable development*, *seed varietal turnover*, *innovation systems*, *value creation*, and *value capture*. The search yielded 227 articles relevant to the topic of study. A total of 211 (93%) are peer reviewed, and 215 (95%) have a publication date between 2014 and 2018. Of the studies covered, 159 support the literature review equating to 68% of the total sources. In the literature review section, 150 (94%) are peer reviewed, and 121 (94%) were published between 2015 and 2018.

## **Agribusiness Seed System in Sub-Saharan Africa**

**Importance of innovation to agribusiness seed leaders.** There is widespread acknowledgement by agribusiness company owners, farmer seed consumers, governments, agricultural scientists, and development workers of the importance of seed as a vital element in boosting agricultural production and the role seed plays in conveying new innovations to smallholder farmers (Mabaya, 2017; Kusena, Wynberg, & Mujaju, 2017; McGuire & Sperling, 2016; Sapkota, Joshi, Kattel, & Bajracharya, 2017; Spielman & Kennedy, 2016). Spielman and Kennedy (2016) pointed out the importance of seed systems and seed industry growth in developing countries as a mechanism for advancing agricultural productivity and improving food security. The role of policy in promoting that industrial growth has been disappointing as policymakers battle to balance the policies, rules, and regulations to the development needs of their different countries complex set of societal and economic trade-offs. Spielman and Kennedy (2016) identified two trade-offs as static trade-offs, which occur in how benefits of innovation are distributed among different role players in the seed system, and intertemporal trade-offs, which exist when new innovations threaten genetic diversity required for future innovations.

Kusena et al. (2017) pointed out that there is also acknowledgement by the World Bank and the International Panel of Experts on Sustainable Food Systems (IPES) of the important role of the smallholder farming system as the main driver for smallholder farmers productivity, profitability, and poverty reduction driver in Africa. Smallholder farmers constitute a large market segment for small-scale agribusiness company leaders. Despite the widespread identification of the need for favorable enabling environments,

the agribusiness seed industry remains largely underdeveloped in the SSA region with as many as 80% of the farmers having to resort to using own saved unimproved seed (AGRA, 2016; Larson, Muraoka, & Otsuka, 2016; McGuire & Spielman, 2016). The global average of farmers using own saved seeds is 35% indicating that agribusiness seed companies are more developed in other regions than SSA (Mabaya et al., 2013). Although SSA accounts for 15% of the total maize area cultivated globally, it contributes only less than 5% of the global harvest (Gaffney et al, 2016). Mechanisms on how small-scale agribusiness seed company executives can profitably reach more of the more than 51 million smallholder farmers throughout SSA with better seed technology innovations are necessary to improve their food and nutrition security in the face of recurrent rainfall drought (Lowder, Scoet, & Raney, 2016).

**Role of agribusiness seed companies.** Adenle, Manning, and Azadi (2017) reiterated that the SSA agribusiness seed businesses are underdeveloped because the sector's agribusinesses players remain largely informal with several small agro-enterprises. There are, therefore, significant opportunities for agribusinesses to grow as mechanisms for economic growth and enhancing agricultural growth and meeting the rising urban food demands while linking to rural sources of agricultural production (Adenle et al., 2017). Agribusiness seed company leaders need functional BMIs to develop a dormant industry on which 82% of all smallholders in the region are dependent, working on less than 2 hectares of land each (Munyi & De Jong, 2015). The major drivers to agribusiness seed companies' growth in SSA are the rising African population and the urgent need to meet the food needs of the continent and achieve sustainable economic growth with resultant social effects. Agriculture offers significant



potential for agribusinesses as the continent has untapped water resources with as much as 65% of the world's uncultivated agricultural land available on the continent (Adenle et al., 2017; Dawson, Martin, & Sikor, 2016; Smale et al., 2015).

Africa, however, still faces low agricultural productivity and low technological innovation, yet most of the continent's population is dependent on agriculture for their economic well-being (Adenle et al., 2017). Keys to unlocking the latent agribusiness potential in Africa lie in the development of key infrastructures such as roads and energy sources, trade liberalization, and innovation (Adenle et al., 2017; Pamuk, Bulte, & Adekunle, 2014).

In addition, the agribusiness contribution to the gross domestic product (GDP) in Africa is 13 times more than in the United States, demonstrating that the agribusiness/agriculture ratio embodies many functions such as agro-based innovations, marketing, supply chain management, processing, transportation, and distribution (Adenle et al., 2017). To unlock the inherent business growth opportunities necessary for contributing to agribusiness competitiveness in Africa, the following factors of (a) the financial services and macroeconomic management, (b) economic infrastructure, (c) technological innovation, (d) land tenure system, (e) political stability, and (f) social infrastructure need to be addressed (Adenle et al., 2017; Long, Blok, & Poldner, 2017).

Keyser (2013) took a seed trade perspective in analyzing the SSA trade flows and identified a number of challenges and opportunities for enhancing trade across the region. The ingoing hypothesis was that Africa remains largely dependent on food imports for its consumption needs as its food output is far below its population growth (Durkin, 2015; Keyser, 2013; Marechera, Muinga, & Irungu, 2016). SSA countries spend nearly \$30

billion to \$50 billion on food imports with projections of \$150 billion by 2030, if there are no corresponding increases in food production growth. The seed industry is central to any agricultural productivity growth in SSA. Other regions have been able to increase their cereal yields at an average of 1.2% to 2.3% from 1980 to 2000, whereas SSA remains at 0.7% (Keyser, 2013). Significant productivity enhancements in other regions have been on the back of improved seed industry growth and development premised on innovation (Keyser, 2013).

In comparison, China, with its human population of 1.36 billion, uses its agricultural sector as a foundation industry to meet the food demands necessitating the modernization of the agricultural sector in an environmentally friendly manner (Xu, Li, & Wan, 2017). Due to crop science innovations, China now produces 25% of the world's food on less than 9% of the world's land and feeds 20% of the world's population (Xu et al., 2017). The key areas of agricultural science innovation implemented by China are in (a) agricultural innovation capacity development, (b) industry technology breakthroughs in seed, disease control, and processing equipment, and (c) technical innovation in terms of water saving and other energy efficient systems (Xu et al., 2017).

**The business case for African seed systems development.** Van Ittersum et al. (2016) analyzed the question of whether SSA can produce adequate food to meet the rising global demand for food by 2050 given the global drivers of food price volatility for major crops, limited arable land for crop production, and the growing population. The authors focused on analyzing the potential to close the yield gap between available seed technologies and their potential (Van Ittersum et al., 2016; Waldman, Blekking, Attaric, & Evans, 2017). Yield gap is defined as the difference between a seed technology's

present performance versus its full potential (de Janvry et al., 2017; Van Ittersum et al., 2016). Van Ittersum et al. also analyzed SSA present self-sufficiency ratio in staple cereal, which is reported to be 0.8 to 1, which measures the ratio between domestic food production versus the total food demand (Van Ittersum et al., 2016). The authors criticized the limited growth of the agricultural sector in SSA because it has been the major driver in other regions through total factor productivity. For the SSA region, the total factor productivity growth has been less than 1% per year for the last 2 decades (Van Ittersum et al., 2016).

Van Ittersum et al. (2016) analyzed data from 10 countries in SSA. The 10 countries were chosen on the basis that they jointly account for 54% of the SSA 2010 population and account for 58% of arable land in SSA. The authors estimated SSA's cereal demand by 2050 based on per capita consumption in relation to projected income growth, looking at five major cereals: maize, millet, rice, sorghum, and wheat. Van Ittersum et al. further estimated cereal production potential based on existing yield gaps for the different cereals per target country. The authors found that cereal yield growth is happening at a slower rate than population growth for eight of the 10 study countries because population growth is projected to be fourfold between 2010 and 2050. Van Ittersum et al. estimated that maize yield growths will need to rise to 72% of present yield levels with smallholder farmers. Closing the seed yield gap represents a business opportunity for agribusiness seed company leaders (Mannan et al., 2016; Kong et al., 2017).

**Agribusiness seed description.** Seed can be defined as a technology transfer agent or mechanism to enhance food production and productivity that stimulates local

and national economic development and entrepreneurship (Louwaars & de Boef, 2012; Poku, Birner, & Gupta, 2018). Mabaya et al. (2013) classified seed into four main categories: (a) cereal food crops, (b) pulses and oils, (c) tuber and root crops, and (d) vegetables. Second, Mabaya et al. added that the formal seed systems comprise the breeding, seed production, processing, marketing, quality control, and certification as legislated in each country. In addition, Durkin (2015) and Keyser (2013) articulated the requirements for seed trade in the SSA region starting from breeding of seed to variety release and commercial sale. The key steps are testing procedures such as the value for cultivation (VCU) and distinctiveness, uniformity, and stability (DUS) tests (Wattnem, 2016).

Given the complex seed variety testing requirements, plant breeders can take anywhere between seven to ten years or even more to register new seed varieties (Keyser, 2013; Munyi & de Jong, 2015). Such long lead times derail the rate at which new seed innovations get to the market and resultantly negatively affect agricultural productivity and the ability of agribusiness leaders to close the technology innovation gap (Abate et al., 2017; AGRA, 2016, McGuire & Sperling, 2016). The latest assessment of modern seed variety adoption rates indicates a low 35% adoption of modern seed varieties on all total cultivated area in SSA (Abate et al., 2017). As a result, between 80% and 90% of the millions of smallholder farmers in eastern and southern Africa (ESA) still plant low quality recycled seed, which represents a lost business opportunity to seed companies and smallholder farmers alike (AGRA, 2016; McGuire & Sperling, 2016). The reasons for this low product uptake range from low seed technology turnover (Atlin et al., 2017; Spielman & Kennedy, 2016), seed unavailability, inadequate information, and high seed

prices for and by smallholder farmers respectively (Fischer et al., 2015). In addition, it takes an average of 14 years for seed varieties to be replaced with modern high yielding varieties (Abate et al., 2017; Khanal, Adhikari, & Wilson, 2017).

Keyser (2013) also provided key distinctions in the types of seed produced. The first type of seed is the hybrid seed, which is generated from a controlled method of pollination, in which germplasm of plants is selected for their particular traits and is mixed to produce the required seed variety. Such seed is called first generation (F1) seed and requires rapid replacement as replanting the same seed or its subsequent generations results in yield losses of between 30% to 40% (Keyser, 2013). The second seed type is the open pollinated variety (OPV), which is developed through the cross-pollination of strong and genetically diverse seed parents producing variable height, grain color, cob size, disease resistance, and time to maturity. In other words, there is wide variation in the characteristics of the crop unlike in the hybrids where there is uniformity.

The OPVs do not lose yield potential with subsequent replanting of the same crop. The third type of seed is the traditional landraces, which is seed that has been passed down for generations from farmer to farmer exchanges. These seeds tend to have the same features as OPVs except that they are more diverse and contain many genetic features and are dominant in the informal seed systems discussed later. The yields from landraces are much lower than OPVs and hybrids. The fourth category of seed is the closed pollinated seed, which comprises crops that self-pollinate such as legumes, rice, and wheat (Keyser, 2013). Abate et al. (2017) and Erenstein and Kassie (2018) indicated that there are three seed types typically grown by SSA farmers these being (a) hybrid seeds, (b) OPVs, and (c) local traditional varieties. Abate et al. (2017) and Erenstein and

Kassie (2018) focused on maize as the main crop in SSA grown in 48 countries and with the highest calorie consumption of 348 kcal per person per day, making maize seed a strategic product for seed companies.

**Seed technology innovation gaps.** The seed technology gaps in SSA seed systems stem from the key limitations to SSA's seed industry development and seed trade through lengthy seed variety release periods as well as the cumbersome trade requirements across borders (Atlin et al., 2017; Keyser, 2013). Each country has national seed variety release committees that meet at different intervals to approve or decline approve the release of new seed varieties for sale in their countries (Joshi et al., 2017; Keyser, 2013; Munyi & de Jong, 2015). Most of these variety release committees meet only once a year due to resource limitations. Even when a new seed variety is approved, it may take an additional two to three additional seasons to build the new seed variety seed to sufficient quantities to market it as seed (Gaffney et al., 2016). Multinational seed companies and international research organizations have invested in plant breeding to produce new seed varieties (Fisher et al., 2015). Such research and development investment by agribusiness seed companies and related public research centres in Africa yielded 160 drought-tolerant maize varieties between 2007 and 2013 (Fisher et al., 2015).

These research and development efforts have not necessarily translated into a corresponding technology adoption as measured by market penetration of seed companies and adoption of modern varieties by farmers. Other than for maize seed, market penetration by small-scale agribusiness seed companies with such seed remains low (Kusena et al., 2017; McGuire & Sperling, 2016; Mondal et al., 2016).

Abate et al. (2017) analysed the different types of maize seed varieties grown by smallholder farmers (seed customers of seed companies) in 13 countries in the 2013/2014 crop season in SSA. The study is important in assessing agribusiness seed companies' performance as it remains low amongst the smallholder farmer customers as a measure of how seed company leaders are matching seed customer requirements (Abate et al., 2017).

Abate et al. (2017) established that over 500 maize seed varieties were grown in the 13 African countries of focus in the 2013/14 crop season. From the same survey, 32% of all seed grown were hybrids, 23% were improved OPVs, while 46% were local traditional varieties (Abate et al., 2017). The overall weighted average age of the seed varieties was 15 years indicating that seed variety turnover cycles were too slow and agribusiness leaders were failing to close the technology innovation gap (Abate et al., 2017). The research article is useful to my doctoral research topic of BMI as value proposition is a critical element of the BMI framework. Seed innovations by seed companies are a critical component of the value proposition. Abate et al. (2017) traced the seed industry innovation history in SSA since maize breeding started on the continent in the first decade of the 1900s in Zimbabwe and noted that nearly 1700 maize seed varieties have since been released between 1950 and 2014. The rate of varietal turnover is a good measure of the seed companies' product innovation performance (Abate et al., 2017; Atlin et al., 2017).

**Structure of agribusiness seed systems.** Agribusiness seed systems are broadly considered to be made up of two sectors- the formal and informal seed systems (Erenstein & Kassie, 2018; McGuire & Sperling, 2016; Poku et al., 2018; Sisay, Frans, Verhees, & van Trijp, 2017). To amplify the classification, Louwaars and de Boef (2012) established

core criteria for distinguishing the formal and informal seed systems based on the following parameters:

1. Objectives: whether a seed system has a focus on livelihoods, food supply or commercial income generation.
2. Types of farmers targeted: whether the seed systems target subsistence oriented versus commercially oriented farmer customers
3. Crops of focus: the extent to which the seed system focuses on food crops for own consumption or cash crops grown for specific marketing purposes
4. System of seed production: whether the seed production methods are predominantly focused on self-pollinating versus hybrid seeds production systems
5. Orientation of the seed sector: the extent to which a seed system has a food security orientation versus a market or profit orientation.
6. Type of organisation promoting the system: the dominant players in the sector among the public, private company, multinational, nongovernmental organization (NGO), farmers' cooperatives or informal farmers' groups.

Poku et al. (2018) shared the same view that there are broadly two categories of seed systems- the formal and informal or traditional seed with the former involving plant breeding and government seed certification and marketing by the private sector while the latter involves farmer led traditional varieties development and exchange among farmers. In support of the same agribusiness seed sector classification, Mabaya et al. (2013) added a typology of formal seed sector development into five stages of development of (a) nascent, (b) emerging, (c) early growth, (d) growth, and (5) mature. These seed sector development phases are based on farmers adoption of improved seed, breeding and



variety release by agribusiness seed companies, development of the policy and regulatory environment and the extent of private sector participation in the seed sector. Informal seed systems are characterized by use and retention of farmers' own seeds, which are guided by informal farmer exchanges and no government regulation (Mabaya et al., 2013).

**Seed Sector Analytical Framework.** Erenstein and Kassie (2018) supported the same classification and defined the formal seed system as an organized seed system driven by public and private seed companies and the informal seed system as farmer driven and institutionalized characterised by seed saving, seed exchange, and seed production by farmers. In a 2018 survey, Erenstein and Kassie (2018) established that the informal seed sector is still a major source of seed for smallholder farmers in east Africa with as much as three quarters of the seed needs of farmers met through the informal seed sector.

**Formal seed system features.** The features of a formal seed system are provision of tested seed varieties produced under scientific methodologies of plant breeding, controlled multiplication run by public or private sector scientists. The focus of the formal seed system tends to be for a limited focus of crops such as hybrids, high value horticulture crops whose commercial offtake can cover “all the overheads, including transportation and quality management costs, and offer profit” (Louwaars & de Boef, 2012.p.45). Crops such as legumes and most cereals are generally excluded from such a system owing to competition from the informal seed system. The formal seed system is characterised by three types of players- multinational, national companies, and small-scale seed companies (Louwaars & de Boef, 2012).

The public sector plays critical roles in both informal and formal seed systems with a heavy leaning towards the formal seed system. Key roles include:

1. Research in breeding through varietal development through subsidy arrangements, seed quality control and quality seed promotions
2. Policy and regulatory: provide frameworks that guide private sector to invest in breeding, seed production, as well protecting seed companies' intellectual property rights and seed quality control through varietal release, seed certification, and phytosanitary measures for import and export (Louwaars & de Boef, 2012).

**Limitations of formal seed system.** The formal seed system is premised on the quality of the breeding programme as it guarantees the genetic material for producing any seed. In the absence of new genetic material, the formal seed system cannot offer something new that farmers do not already have (Louwaars & de Boef, 2012). Farmers purchase new seed to access new varieties. Seed production quality guarantees quality seed and efficient delivery systems enable seed company leaders to reach their markets with the right quality and quantity of seed at the right prices at the right times. Any weaknesses in such a system renders the formal seed system inferior to the informal seed system (Abdi & Nishikawa, 2017; McGuire & Sperling, 2016; Rubyogo et al., 2016).

**Informal seed system features.** The main distinctions of the informal seed system from the formal seed system are around the methods of seed selection, production, and diffusion by farmers, which is predominantly seed exchange among farmers (Louwaars & de Boef, 2012; Poku et al., 2018; Rubyogo et al., 2016). Farmers exchange, or gift each other with seeds (relatives or neighbors) or bartering as well as buying from local markets (Louwaars & de Boef, 2012). The informal seed system also

has to satisfy the availability, quantity, quality, and price criteria. Farmers use the informal seed system because they are familiar with the seed and regard those seeds as better adapted to their local conditions and taste preferences (Poku et al., 2018).

**Limitations of informal seed systems.** The major limitations of the informal seed system relate to four major factors. First, seed is not readily available: farmers face periodic shocks due to droughts, civil unrest, or floods or poverty, which doesn't enable them to put seed aside from their previous harvest. Under such circumstances farmers have to resort to seed from relief operations, which means a significant loss in genetic resources. Second, "seed supply of major crops is anti-cyclical when compared to crop production" (Louwaars & de Boef, 2012, p.44). When farmers experience a good harvest, there is an abundance of seed to exchange, barter, gift, or sell. When farmers experience a poor harvest, there is limited seed available for the farmer and their social network (Challinor, Koehler, Ramirez-Villegas, Whitfield, & Das, 2016; Louwaars & de Boef, 2012). Third, the intricacies involved in producing particular crops are more complicated and informal seed systems may suffer from poor germination capacity and disease infestations within the seed. Additionally, the seed varieties genetic qualities may degenerate. Fourth, there is slow adaptation of crops in changing farming conditions such as climate change, new diseases.

Despite all these challenges, the informal seed systems offer some advantages as good farmers are able to produce good seed for exchange or sale within their networks (Louwaars & de Boef, 2012). It is no wonder then that 80% of all seed used in Africa comes from the informal seed systems with some crops registering as much as 100% (Borda-Rodriguez, Johnson, Sahw, & Vicari, 2016; Coomes et al., 2015; Louwaars & de

Boef, 2012; McGuire & Sperling, 2016). Such seed sector performance led some scholars to question the classification of seed systems into formal and informal archetypes (Kusena et al., 2017; McGuire & Sperling, 2016). The prevailing classification of the seed industry into two dominant analytical framework of informal and formal seed sectors (Erenstein & Kassie, 2018; McGuire & Sperling, 2016; Poku et al., 2018) is premised on the argument that seed systems transition across a continuum from basic to mature seed systems, which entails a reduction in the role of the informal seed systems towards the formal seed. This analytical framework is considered simplistic and focuses on seed systems development from pre-industrialization to full-scale maturity. The proponents of the second integrated analytical framework argue that seed systems are a lot more complex and need to be analysed as integrated systems where both the formal and informal seed systems co-exist and are complementary (Louwaars & de Boef, 2013). This framework is akin to the BM alliances and an innovation ecosystem (Adner, 2016; Bouncken & Fredrich, 2016).

Kusena et al. (2017) further argued that smallholder farmers' agricultural success is directly linked to the viability and resilience of seed systems with seed being the basic unit of crop production and its quality key to determining yields. Informal or local seed systems account for 60% to 100% seed sources for smallholder farmers in Africa (Kusena et al., 2017). In a 2017 survey, Kusena et al. found that 75% of farmers surveyed grew sorghum with farmer led seed systems being the predominant source of seed accounting for 68% reinforcing the importance of farmer-led seed systems. McGuire and Sperling (2016) also concluded that 50,9% of farmers in six SSA countries (including

Zimbabwe) sourced their seed from the informal seed systems (Abdi & Nishikawa, 2017; Kusena et al., 2017; Rubyogo et al., 2016).

**Seed business model features.** There are three interrelated steps in the formal seed system- (a) varietal development, (b) seed multiplication, (c) seed marketing and promotion. Seed breeding involves breeder seed or first-generation seed and foundation seed or second-generation seed. Seed multiplication involves the production of commercial certified seed, which is the final seed sold to the farmers. Seed certification is undertaken by the public-sector authorities at every stage of the seed cycle. Marketing and promotion concern the passing of information to the farmers about the seed varieties and market the seed for the farmers to purchase. Within each of these seed development and marketing stages, there can be market failures, which can lead to inefficient resource allocation (Poku et al., 2018).

**Seed technology breeding models.** Seed varietal replacement or turnover remains the most important seed system performance indicator but by no means the only one (Atlin et al., 2017; Louwaars & de Boef, 2012). With more than 80% of the seed planted in SSA coming from the informal seed systems. Why has the informal seed system thrived? Louwaars and de Boef (2012) articulated a number of reasons for this state of affairs. First, low market access by the formal seed system has meant that farmers have to resort to the informal seed system. Second, remote locations remain underserved by the formal seed system and remain largely inaccessible to private enterprises. Third, the farmers limited purchasing power due to low access to financial products or credit to buy seed means that they have to rely on exchange and barter systems replete in the informal seed sector. Forth, the formal seed systems have remained largely narrow in

their product range and diversity to cater for the farmers food and cash crop requirements. Fifth, organisational and institutional limitations of the breeding programmes that have hindered them from adapting their crop breeding programmes to the specificities of the varying climatic conditions of the smallholder farmers in remote locations have left the smallholder farmers at the mercy of the informal seed systems.

There are increasing efforts to integrate both the formal and informal seed systems with farmers increasingly integrated into formal seed systems as seed growers and seed customers similar to an integrated BM (Dawson, Martin, & Sikor, 2016; Kulins, Leonardy, & Weber, 2016; Louwaars & de Boef, 2012; Ricciardi, 2015). In addition, agrodealers are increasingly integrated into the private seed companies formal seed systems supply chains thereby extending the seed distribution network.

**Differences between the first and third world seed systems.** There are significant differences between the SSA and the European and American seed systems. The European and North American seed systems are built around private seed sector players with significant in-house breeding programmes and marketing infrastructure and a highly well-informed customer and consumer base (Liua et al., 2015; Louwaars & de Boef, 2012). The development of the SSA seed systems followed the same model albeit driven by public institutions with a development orientation as opposed to a commercial orientation. As a result, the SSA seed systems were primarily focused on seed breeding, multiplication, and distribution with little marketing (Louwaars & de Boef, 2012; Poku et al., 2018; Witcombe et al., 2016). The seed breeding programmes via international research organisations bred and released new seed varieties into the national public research institutions who in turn passed on the seed into the public extension systems for

distribution to farmers through subsidized input distribution programmes. With the introduction of structural adjustment programmes in the 1980s and 1990s, SSA governments were forced to transform a number of these “public seed units into private or public market and profit-oriented seed enterprises” (Louwaars & de Boef, 2012, p.51).

In contrast, Atlin et al. (2017) underscored the importance agribusiness seed companies’ profitability and how the commercial viability of the seed companies are tied to profitable farmer customers that grow high-yielding seed varieties and are profitable in their agribusiness ventures. The case of the U.S. Corn Belt farmers and China where seed companies generate new improved seed varieties every 3 to 5 years is considered the seed industry innovation standard (Atlin et al., 2017). Most seed systems in SSA have germplasm that is older and was developed over 30 years ago under different climatic and agricultural conditions to the present crop growing conditions (Atlin et al., 2017; Campbell et al., 2016).

In addition, national seed breeding and seed company innovation programs in SSA trail behind the multi-national corporations (MNCs) breeding programs that have more superior innovation programs (Atlin et al., 2017). As a result, the performance of farmers served by the MNCs in maize (corn) is an average of 8.8 tonnes per hectare in the United States compared to 1.8 tonnes per hectare in SSA, which translates into a lost business opportunity for seed companies in SSA as seed company profitability is tied to their seed customer profitability (Atlin et al., 2017).

The options for improving the agribusiness seed company seed innovations is to reduce the seed variety turnover cycles from ten years to 3 to 4 years through improved breeding innovations linked to national seed breeding programs. Such innovations should

also involve strong innovation alliances with international public research organizations that have global seed breeding programs akin to innovation clusters (Atlin et al., 2017). Such alliances constitute innovation ecosystems, which are networks of organizations working together to achieve collective value creation and value capture (Breuer & Ludeke-Freund, 2017; Garcia-Castro & Aguilera, 2015; Husain, Dayan, & di Benedetto, 2016).

**Seed systems transitions after economic liberalization.** The net effect was a focus by these private enterprises on a few commercially viable seed varieties and a much narrower seed customer base of large commercial farmers for hybrid maize at the expense of all other seed varieties (Louwaars & de Boef, 2012; Poku et al., 2017). This vacuum created by both the public seed and private seed entities left a gap that a combination of NGOs and public research centers readily filled working directly with farmers in the informal seed sector. Lately, there has been a rise in the number of small-scale seed enterprises also called local seed businesses that have entered the formal seed system serving the bottom of the pyramid with a number of seed varieties. The small-scale seed companies represent a shift from the public sector and NGO developed centered seed system development orientation to a commercial seed system serving the remote rural farmers (Beuchelt & Zeller, 2016; Tantaló & Priem, 2016).

**Seed sector challenges after economic liberalization.** The importance of using improved crop varieties is a critical ingredient to agricultural productivity and business viability for seed companies as subsequent seed sales are based on farmers previous agricultural season performance. A well-functioning seed system that transmits improved seed varieties to farmers is therefore critical (Poku et al., 2018). With many governments



liberalizing their agricultural seed systems, the transition to private sector seed provision has not been effective and the limited complementarities between the government and private sector players has led to weaker institutional arrangements. The key focus areas of institutional coordination center around the seed breeding, multiplication, and marketing (Poku et al., 2018).

The focus of privatization was to enhance smallholder farmers access to improved seed through a profitable and vibrant private sector seed system (Poku et al., 2018).

While there have been encouraging signs of private sector entry into the seed sector in Africa, technology adoption as measured by farmers adopting improved seed varieties has remained disappointingly low (Abate et al., 2016).

**Low seed technology adoption.** Technology adoption studies have tended to focus on the socio-economic and agro-ecological factors and their interface with farmers adoption patterns, which are all demand side factors. Few studies have focused on the supply side factors influencing the supply of improved seed varieties for farmers to adopt (Poku et al., 2018). There are no known studies addressing the BM aspects of seed technology development and marketing and their adoption by the farmers in SSA (Tell et al., 2016; Sivertsson & Tell, 2015).

**Breeding and varietal development market failures.** By its nature, new variety development is capital intensive and requires large capital outlays to access germplasm, test the seed in trial plots (research and development), and the requisite equipment and technical competence to generate new seed varieties (Atlin et al., 2017; Poku et al., 2018; Spielman & Kennedy, 2016). First, the long lead times to development of new varieties serves as a deterrent of under-resourced small-scale seed companies who then have to

depend on varieties developed by public sector research organisations or Consultative Group on International Agricultural Research (CGIAR) institutions (Kratzer, Messner, & Roud, 2017; Poku et al., 2018).

Second, even when seed companies have the resources to invest in developing new seed varieties, the uncertainties regarding payoffs remain a deterrent as adoption of that particular technology by smallholder farmers remains uncertain. Besides, farmers can recycle their older seed varieties and not purchase the new seed varieties therefore upsetting the investment payoff expectations of the seed companies (Poku et al., 2018). The public good nature of the publicly released seed varieties and OPV, which can be recycled create a non-excludability disincentive for private companies, which discourages private investment in generating new seed varieties (Greco, Grimaldi, & Cricelli, 2017; Poku et al., 2018). Large seed companies with the requisite resource base therefore choose to focus on seed varieties with excludability features and hence the pre-occupation of hybrid seeds by multinational and national seed companies and the underserving of smallholder farmers with improved seed varieties.

Government research institutions are therefore left with no choice but to step in and engage in varietal development to address the non-excludability problems of OPVs on the grounds of food security and major export crops grown by smallholder farmers (Poku et al., 2018). The state run programmes receive support from the CGIARs for new varieties. Institutional failures result from the weak linkages between these public research institutions and farmers leading to misalignment of developed seed technologies and farmers expectations with resultant low adoption of those new technologies (Poku et al., 2018).

**Seed Multiplication and certification market failures.** The second major seed BM challenge is the seed technology non-excludability problem that persists into seed multiplication and certification from a price of seed compared to that of the commercial grain generated from that seed especially in the case of the OPV seed (Poku et al., 2018). Hybrid seeds tend to have a higher yield than OPV seeds and therefore offer higher incentives to seed customers from a profitability perspective and multinational and national seed companies tend to concentrate multiplying and marketing those hybrid seed varieties. An attendant problem is the information asymmetry faced by the potential farmer seed customers, which, dissuades them from adopting new seed varieties and instead the farmer seed customers opt to replant their retained grain as seed (Poku et al., 2018). This is partly the reason why many smallholder farmers still obtain their seed from the informal seed system (Ghimire, Wen-Chi, & Shreshta, 2015).

Similarly, the public research bodies breeders involved in seed multiplication face incentive challenges from a funding as well as a performance measurement perspective. Public researchers/breeders are measured on the number of new seed varieties released and not the quantity of breeders' seed produced from already registered seed varieties (Poku et al., 2018). As such researchers and breeders in public research entities concentrate on developing new seed varieties as opposed to multiplying the seed already available. Such actions limit the amount of available breeders' seeds required by smaller seed companies that do not have their own seed breeding programs. Another institutional failure is the weak seed inspection service to certify seed in remote field locations, which creates quality uncertainties among the seed customers (Poku et al., 2018). The situation is not helped by the fact that most governments have these seed certification services

centralized in the major cities. A solution can be found in BM alliances to ameliorate the costs (Bounchen & Fredrich, 2016; Xu et al., 2017).

**Seed marketing and promotion market failures.** There are a number of causes of market failure in seed marketing and promotion. First, because some seed varieties have non-excludable benefits (OPVs and self-pollinating seed varieties), seed companies tend to focus on hybrid seeds, which may not necessarily be what smallholder farmers want to buy (Poku et al., 2018). Second, those seed companies that invest in marketing and promotion of OPVs and self-pollinating seed varieties face the challenge of inability to recoup their investment as other seed companies marketing the same publicly registered seed varieties benefit from their marketing and promotion investment (Gans & Ryall, 2016; Poku et al., 2018). This is the typical free rider problem “where those benefitting from a service are not paying for it, which results in under-provision of a service” Poku et al. (2018, p.32). Thirdly, smallholder farmers are geographically dispersed and the transaction costs of serving those remote locations are prohibitive and hence most seed companies tend to concentrate on smallholder markets that are easily accessible (Kansiime & Mastenbroek, 2016; Rueda, Garret, & Lambin, 2017).

In arguing for adaptive seed systems, Atlin et al. (2017) pointed out four key factors of consideration as (a) seed yield potential, (b) seed end use quality, (c) agronomic fit between the seed and farmers’ cropping system, and (d) profitability considerations for the seed company and the end user farmers. The key challenge in SSA is that seed systems are not generating new improved seed varieties fast enough to catch up with changing climatic conditions. As a result, smallholder farmers keep growing older varieties that are older than 20 years with resultant yield underperformance and low

purchasing power of seed company products (Atlin et al., 2017; Ortega, Waldman, Richardson, Clay, & Snapp, 2016).

In a separate study, Walker et al. (2014) examined seed technology diffusion as a measure of research and development (R&D) effectiveness and the relative contribution of such R&D to incomes and poverty reduction in SSA (Walker et al., 2014). The research project measured the diffusion and impact of improved varieties in Africa (DIIVA). The 2014 study was part of a longitudinal study started in 1998 covering 20 crops cultivated on over 83% of the total agricultural land area in Africa (Walker et al., 2014). The methodology for the DIIVA survey was a combination of household surveys and panels of experts from National Agricultural Research Systems (NARS); the CGIAR, and private sector seed companies' representatives (Walker et al., 2014). The main conclusions were that the area covered by modern varieties (MVs) had moved from 25% in 1998 to 35% in 2010 (Walker et al., 2014). The annual growth rate of new technology adoption was therefore a disappointing 1.45% per annum (Walker et al., 2014). The authors concluded that the velocity of seed varietal change was 14 years meaning that farmers held on to seed varieties for as long as 14 years before they took up new varieties (Fisher et al., 2015; Walker et al., 2014).

**BM and BMI background.** BM and BMI have attracted increasing attention from management practice and academic research (Kranich & Wald, 2017). The BM is an important tool for holistically describing and explaining a business as well as developing and implementing a business strategy and implementing innovations or bringing innovations to market in a competitive manner (Kranich & Wald, 2017). In developing and implementing BMs, consistency is considered key to align the BM

elements to maximize their outcomes in what can be called virtuous cycles that lead to competitive advantage (Kranich & Wald, 2017). Conversely, low BM elements consistency leads to low business performance. BMI helps to rearrange the BM elements and make them more consistent through innovating around those elements or how they are arranged in the BM architecture (Kranich & Wald, 2017).

**Origins of BMs and BMI.** The origins of the BM concept are found in management practice and academic research and their research have entered a strong exponential growth phase (Kranich & Wald, 2017). Despite this acknowledged importance of the BM and BMIs, there is no unanimous understanding of the BM concept because of the interdisciplinary nature of the subject matter. Literature on BM spans strategic management, innovation and technology management, and entrepreneurship (Foss & Saebi, 2017; Kranich & Wald, 2017; Saebi, Lien, & Foss, 2017). The wide application of the BM concept for different functions in different fields demonstrate the utility of the BM concept yet at the same time complicates research as there is no convergence of knowledge as each field develops independent of the others (Kranich & Wald, 2017).

**BM background.** Management research has treated BM research as a novel unit of analysis (Saebi et al., 2017). Despite the growing popularity of BM research, there is no universally agreed upon definition with many definitions revolving around a firm's value proposition, mechanisms of value capture and the architecture of the BM elements. Scholars and management agree that the choice and design of BMs is central to exploring and exploiting new business opportunities, even as they have not reached consensus on how to define BMs and BMI. Saebi et al. (2017) adopted Teece's BM definition, which

posits that a BM is a management hypothesis regarding “what customers want, how they want it, and how the enterprise can organize to best meet those needs, get paid for doing so, and can make a profit” (Teece, 2010, p.172). The concept of a business hypothesis is akin to a research hypothesis in, which researchers collect data to test the hypothesis with the business leaders testing their hypothesis through the market response they obtain from customers (Saebi et al., 2017).

**BMI challenges.** Researchers and managers agree that the constitutive elements of BMs are (a) value offering, (b) value architecture, and (c) value capture or revenue model (Spieth & Schneider, 2015). BMI is considered a highly challenging management activity separate from product or service innovation, which business leaders have tended to focus on as a management endeavor (Spieth & Schneider, 2015). The challenge with BMI is twofold. First, it challenges the well-established processes and routines that may be working and delivering value (Christensen, Bartman, & van Bever, 2016). Spieth and Schneider (2015) argued that existing BMs create inertia and any new BMs challenge the status quo. Second, BMI is a demanding leadership task that requires experimentation and learning and new levels of creativity and market expertise and investment into the unknown (Spieth & Schneider, 2015).

**BM value creation and value capture.** Scholars agree that new ideas that are good will create consumer value and also attract resources while the bad ideas fall aside (Priem, Wenzel, Koch, 2017). Examples of these phenomena are noted in companies such as Uber and others that have taken on the same idea, such as Lyft and Didi along with Taobao and others (Priem et al., 2017). The essence of these BMs is that the business leaders driving them created value and then captured it and supports the notion

that firm success is predicated on value propositions that generate value for the consumers. BMs are all about value creation to increase benefits to consumers while enabling value capture for profitable delivery of that value (Priem et al., 2017).

Successful firms therefore derive their success from (a) focusing on downstream value chain activities such as product markets as opposed to upstream factor markets, (b) a strong emphasis on value creation before value capture, and (c) demand creation activities (Priem et al., 2017).

**Background to BM and BMI research.** BMs and BMI are topics that have been receiving significant scholar-practitioner research attention over a 50-year period (Wirtz et al., 2016). Between the period 1965 and 2013, a total of 16 950 articles were generated on BMI. Their findings indicated that out of 16 950 articles, 2 823 were peer reviewed. Of the peer-reviewed articles, 471 applied a case study method, 111 used multivariate methods while 2241 were conceptual designs (Wirtz et al., 2016). Despite the recognition given to this topic, it is surprising that there is a dearth of empirical research into agribusiness seed company BMIs that can close the mismatch of seed technology requirements by smallholder farmers and what seed companies can provide (Fisher et al., 2015). While the robust research was conducted in the seed sector, it has suffered from a narrow focus, which paid no attention to the seed companies BMIs. There has been a focus on the new product development from a scientific perspective (Coomes et al., 2015; Fisher, et al., 2015; Hampton, Conner, Boelt, Chastain & Rollston, 2016; McGuire & Sperling, 2016; Violon, Thomas, & Garine, 2016).

**Historical phases of a BM.** Ritala et al. (2018) mapped the three phases of business leaders' responses to societal needs. The first wave was in the early 1970s when



corporate social responsibility and environmental issues came to the fore in the wake of the Bhopal accident (Ritala et al., 2018). The second wave was in the late 1980s when business leaders started advancing the triple bottom line for strategic competitiveness. The third wave started at the turn of the century with increasing globalization pressures and global supply chains and a sharper focus on societal challenges such as bribery and corruption, human rights, environmental protection and political influence (Ritala et al., 2018; Schaltegger, Hansen & Ludeke-Freund, 2015).

**Two BM research streams.** Priem et al. (2017) and Wirtz et al. (2016) framed two main different streams that characterize BMs as articulated logics of the firm and a pattern of activities. In essence, the two streams are inherently similar in that one focuses on the firm logic that enables activities that create value to be undertaken underpinned by the same firm logic as the architectural core of the business (Priem et al., 2017). The history of BMs can be traced to the internet era in the mid-1990s when digitization of products and markets proliferated and created new ways for firms to interact with consumers and even co-create value with consumers and capture value through digital platforms at the same time that were not thought of previously (Wenzel et al., 2017; Wohlgemuth et al., 2016). There was widespread interest to understand how such firms built their businesses digitally as they rendered some non-digitized firms obsolete with new entrants in the newspaper and funeral industry thriving at the expense of incumbents (Karimi & Walter, 2016; Wenzel et al., 2017). A number of incumbent firm business leaders soon realized they had to more than digitize but address the underlying BM fundamentals (Mehrizi & Lashkarbolouki, 2016; Wenzel et al., 2017). Since that period,

research on BMs has shed light on how business leaders design their firms, develop, innovate, renew and innovate their business logics (Priem et al., 2017).

**BM research in various fields.** Foss and Saebi (2017) commented that there is growing interest in research on BMs and BMI beyond the community into other fields such as technology management, international business, and sustainability. Over the period 1980 to 2015, 7 391 BM and 349 BMI publications were recorded in the Scopus database (Foss & Saebi, 2017). Within this milieu of BM and BMI research, theories have been advanced based on dynamic capabilities, threat rigidity, and prospect theories, entrepreneurship transaction cost economics, innovation, replication and competition (Foss & Saebi, 2017). The authors pointed out that there is still little agreement on what is the unit of analysis for BM and BMI and the actual definitions of the two terms. Foss and Saebi (2017) further attribute the discordant views to (a) the several attributes variously influencing firm performance, (b) different cognitive and linguistic schemas being applied in BM and BMI, and (c) different conceptual representations of organizations applied in BM and BMI research. In framing this research challenge, the authors drew parallels with the transaction cost economics (TCE), which was initiated in 1937 but did not take off until the mid-1970 when Oliver Williamson made TCE research through the articulation of the unit of analysis and the role it plays in research (Foss & Saebi, 2017).

**Agribusiness seed BM research.** The second group of research on agribusiness seed companies focused on the research and development of agribusiness seed companies in new seed product development as well as the industry consolidation efforts of agribusiness seed companies and their effect on seed access by smallholder farmers

(Fugile, 2016; Lapple, Renwick, & Thorne, 2015; McGuire & Sperling, 2016; Poku et al., 2018; Sarkar & Pansera, 2017; Tell et al., 2016). The research in this group also focused on the smallholder farmers' seed needs with very little attention paid to seed company BMIs (Barth, Ulvenblad, Ulvenblad, 2018; McGuire & Sperling, 2016; Ricciardi, 2015; Shackleton, Ziervogel, Sallu, Gill, & Tschakert, 2015). The closest research study to BMI among seed companies was that of Sperling, Ortiz and Thiele (2016) in, which they focused on the features of a functional seed system covering aspects such as seed availability, accessibility, variety and seed quality. Sperling et al. adopted a product-centric focus and made no mention or paid no attention to BMI efforts of the agribusiness seed company leaders. Rather, they focused on what smallholder farmers need as seed customers. There is, therefore, limited research on agribusiness seed companies' BMI efforts and what they need to do to address the BMI gap in servicing smallholder farmers' markets.

**Meta-analysis of BMs.** The third group of literature focused on meta-analysis of research studies in BMI tracing the origins of the topic and the distillation of workable elements of BMI (Christensen et al., 2016; Pironti, Cautela, & Christodoulou, 2015; Taran, Nielsen, Montemari, Thomsen, & Paolouse, 2016; Wirtz et al., 2016). From this group of literature, the value drivers' paradigm of BMs emerged with the following BM constructs. First, is value proposition (VP) concerned with what the company offers. Second is the value segment (VS) focused the question of to whom the company makes an offer. Third, is the value configuration (VCo) concerned with how the company develops and distributes its offering cost effectively. Fourth, the value network (VN) focused on who collaborates with the company to develop, distribute, and sell its

offering. Fifth is the value capture (VC) focused on how much, and in what way the company generates revenues (Taran et al., 2016). The two major shortfalls from all these valuable BMI studies are (a) their lack of focus on the third world context, and (b) the absence of any research in the agribusiness seed industry.

**Why BMs are important.** Well intended business ventures fail in the presence of good market opportunities, novelty of ideas, appropriate resource endowment, and talented entrepreneurs and most of the causes can be traced back to the deployment of inappropriate BMs (Boucken, Lehmann, & Fellnhofner, 2016; Morris et al., 2003). A study of BMs is therefore important to ensure that business ventures succeed in creating societal value for its investors, the community, and the environment.

Foss and Saebi (2017) concluded that BM and BMI research fills a critical gap in macro management research on firms as systems and how they are shaped by and shape the macro environment, a fact lost in strategy thinking by linking strategy and innovation. In addition, BM and BMI research does not represent wicked problems since its constructs can be defined, dimensionalized, linked to existing theory and can be clearly articulated into explanatory and predictive tasks (Foss & Saebi, 2017). The authors further pointed out that different BMI typologies require different types of leadership as BM changes are a function of top management in the firm. The research article was useful for my doctoral research in how it provided a BMI typology, one I could apply as a framework for assessing BMI of small agribusiness seed companies.

**Importance of BMs in third world countries.** Howell, van Beers, and Doorn (2017) analyzed the role of BMs in tackling the dual business challenge of value capturing and value creation through frugal innovations for both business profitability

and socio-economic development impact. This study was a useful contribution as most frugal innovation studies were focused on South East Asia and not Africa (Howell et al., 2017). Africa offers fertile ground for frugal innovations given its rapid economic growth with its inflation-adjusted gross domestic product between 2007 and 2015 standing at 4.6% compared to the global average of 2.2% (Howell et al., 2017). Also, Africa's mobile penetration rates are one of the highest in the world, which has ushered new payment modes and BMs such as money transfer (Howell et al., 2017). Howell et al. (2017) commented that doing business in such emerging markets does not automatically lead to profit-making and local development impact and appropriate BMs are significant at the base of the economic pyramid (Roome & Louche, 2016; Sarkar & Pansera, 2017).

Suitable BMs, therefore, need to move beyond consumption of products but also balance that with a willingness to pay (value creation) and appropriate costs structures (value capture). Therefore, value is not just in the product innovation but also in financing and distributing models to reach the consumers (Howell et al., 2017; Rauter, Jonker, & Baumgartner, 2015) and balancing the value creation and value extraction equation, which is difficult to attain in resource-constrained rural Africa such as agribusiness seed company BMs (Weissbrod & Bocken, 2017).

**BM Rationale.** Ritala et al. (2018) examined the adoption of sustainable BMs by Standard and Poor (S&P) 500 companies. Ritala's et al. research was influenced by the public scrutiny larger firms face and the potential controversies that arise on perceived misalignment among profit, people and the planet. There are three drivers for this research. First, there is increasing pressure for company leaders to reduce their negative footprint on consumers or suppliers and the local community. Second, climate change is

focusing firms to green their supply chains. Lastly, new global environmental threats are imposing demands on business leaders to react in meaningful ways through their business operations (Ritala et al., 2018). The authors sought to examine BMs that not only deliver economic value but also address broader social and environmental goals (Ritala et al., 2018).

Ritala et al. (2018) utilized Bouncken and Fredrich's (Bouncken & Fredrich, 2016; Yip & Bocken, 2018) and Schaltegger, Lüdeke-Freund, & Hansen's (2016) taxonomy of sustainable BM archetypes, which is made up of nine archetypes divided into environmental, social and economic categories as major innovation categories in line with the triple bottom line. The authors analyzed data from firms listed on the stock exchange between the period 2005 and 2014 with publicly accessible reports and press releases on their BMs. Ritala et al. established that the focus on sustainable BMs increased from 2006 as the energy-efficiency movement gained prominence. There was also a sharp increase in the BM archetypes of maximizing material and energy efficiency, encouraging sufficiency, inclusive value creation and scale up solutions (Ritala et al., 2018). The authors concluded from this research that business leaders of S&P 500 firms broadly follow profitable societal trends instead of adopting a proactive BMI pursuit. The research is limited in that the authors did not explore the extent to which these initiatives were embedded into mainstream BMs as opposed to being treated as peripheral corporate activities. The study was of interest to my doctoral research nonetheless in establishing the link between organizational strategy and BM archetypes.

**Innovation failure.** In a separate study, Christensen et al. (2016) examined the massive failure in BMI and the wide-ranging concern among chief executives with their

companies' BMI limited success. The authors built their work on two surveys. The first survey was conducted by PWC in 2015 and concluded that "54 percent of CEOs worldwide were concerned about new competitors entering their market" (Christensen et al., 2016, p.31). The second study was conducted by the BCG in 2014 with 1,500 senior executives of whom 94% indicated that they had attempted BMI with mixed levels of success.

**Societal inequality and sustainable development innovation drivers.** Stock Obenaus, Slaymaker, and Slinger (2017) lamented the failure of economic development to close the inequality gap faced by many economies fueling migration, displacement, rising urbanization and environmental degradation. Within that societal dilemma lies the role of technological innovation in pursuit of inclusive industrial growth (Stock et al., 2017). In premising the role of technological innovation in addressing societal challenges, Stock et al. applied the Bruntland Report definition of sustainability as "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" p.216. The authors posited that there are three development pathways faced by business leaders, which are (a) maintaining the status quo, (b) reforming and (c) transformation. Stock et al. (2017) also posited that there are three pillars of sustainability to be considered in innovation, which are environment, society, and economy. Eco-innovation is therefore considered to be the innovation pathway that fosters the required balance among the sustainability drivers (Rauter, Jonker, & Baumgartner, 2015; Stock et al., 2017).

**Technology as an innovation driver.** Howell et al. (2017) analyzed the role of information technology in influencing frugal BMIs in Africa driven by two factors. The

two factors under consideration are (a) the decreasing prices per unit of computing power, and (b) increasing computing power (Howell et al., 2017). These two factors are critical as they have resulted in reduced information costs and the promoted inclusion of previously excluded market players such as communities in far-flung remote areas in Africa through mobile phone penetration. With such technological advancements come opportunities for development of new BMs that can tackle the perennial challenges of value creation and value extraction, which is difficult to attain in resource-constrained rural Africa.

**Institutional drivers of innovation.** Herrera (2016) explored the questions of what institutional mechanisms drive innovation for impact as well the drivers for enterprises to engage their stakeholders in BMI. The study was premised on the fact stakeholder engagement enhances knowledge sharing, co-creation opportunities and offers companies early market mover advantages (Herrera, 2016).

Herrera (2016) conducted three case studies through triangulation methods of literature review, documents review, site visits and observations and interviews with 30 managers, employees, business partners and other stakeholders. The study applied the innovation for impact (I4I) conceptual framework that posits that corporate social innovation addresses social challenges while simultaneously addressing shareholder value (ibid). The conceptual model has five stages of BMI in I4I as (a) assessment, (b) design or ideation, (c) development, (d) systematizing, and (e) institutionalization.

**BM definition challenges.** There are varying opinions on what a BM is despite the increasing focus on BMs research (Foss & Saebi, 2017; Kranich & Wald, 2017; Morris et al., 2003; Saebi et al., 2017). At the heart of the confusion is the interchange of



terms such as BM, strategy, business concept, revenue model, and economic model all of which are intended to communicate the same message of BMs (Foss & Saebi, 2017; Kranich & Wald, 2017; Saebi et al., 2017). As a result, three categories of classifying the plethora of BMs have emerged as the (a) economic, (b) operational, and (c) strategic labels.

The economic label concentrates on how the business generates profits and covers elements such as revenue sources, pricing, company cost structures, margins, and business volumes (Morris et al., 2003). In summary, the economic model concerns how the business will make and sustain its profits. The operational label is about how the business is configured in respect of internal processes and its operational infrastructure to generate value. The key decision points point to the business' production or service delivery methods, how to administer and channel resources and manage the company logistics (Morris et al., 2003).

The strategic level relates to the business strategic market positioning and how to and whom to work with in the market place in order to differentiate the business and deliver value to the customers (Morris et al., 2003). In summary, therefore this category of work concerns how the business leaders choose their customer segments, vary their offerings, and deliver and capture value.

**Definition of BM.** Based on the constellation of the different categories into, which several BMs can be classified into, Morris et al. (2003) defined BMs as “a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets” (Morris et al., 2003, p.727).

While the term BM originated from electronic commerce with an original focus on revenue streams for web-based firms, the concept has evolved to capture all business types with a focus on product offerings, value creating and capturing process, as well as the firm logics (Morris et al., 2003). All in all, there are as many as 24 different elements associated with the BM frameworks with key ones being value offering (11), economic model (10), customer relationship (8), partner/value network (7), internal systems (6), and target markets (5) (Morris et al., 2003; Schneckenberg, Velamuri, Comberg, & Spieth, 2017).

**BMs as activity and component systems.** Kranich and Wald (2017) proposed that a BM definition has to meet three criteria of (a) allow for the breakdown of the BM into different elements, (b) reflect management practice, and (c) be transferable from extant research to real life situations. Two main directions of BM definitions are prevalent in literature: (a) BM as an activity system (Amit & Zott, 2015; Pisano, Pironti, & Rieple, 2015), and (b) BMs as components and sub-components (Morris et al., 2003). The first definition emphasizes value creation and interconnections between activities of the firm. It gets very specific to the analyzed businesses and misses generalisability (Kranich & Wald, 2017).

The component-based definition provides three major levels of the BM and nine elements as (a) value proposition, (b) value creation architecture, (c) profit model (Kranich & Wald, 2017). The second definition better encapsulates the value proposition and delivery, value creation, and value capture elements in a BM (Clauss, 2017; Kranich & Wald, 2017). Criticisms have been levelled against the component-based approaches for their lack of empirical foundations. Spieth and Schneider (2016) provide an empirical

basis for the component-based BM approach based on multiple workshops with innovation experts, management and practitioners (Kranich & Wald, 2017). Additionally, other researchers (Saebi et al., 2017; Schneckenberg et al., 2017) have confirmed findings that support the elements of the component-based BM model proposed by Morris (Kranich & Wald, 2017).

**Theoretical underpinnings of BMs.** The core theoretical models that underpin BMs research span several fields with business strategy (Porter, 1985, 1996), Schumpeterian theory based on growth and profit aspirations (Fritsch, 2017; Schumpeter, 1934; 1942), resource based theory (Gulbrandsen, Lambe, & Sandvik, 2017), strategy network theory (Hussain, Dayan, & Di Benedetto, 2016), cooperative strategies (Roome & Louche, 2016), competitive strategy (Voinea & Eamus, 2017), and transaction cost economics (De Vaan, Vedres, & Stark, 2015) being the foremost theories. Out of all these theories, the BM research field has distilled core elements as (a) firm value proposition: what the firm choose to undertake as business activities, (b) the firm's value network: whom them business leaders choose to work with to create and deliver that value, (c) configuration: the combination of resources to produce specific innovations, and (d) transaction efficiencies and decisions that have to be made to safeguard cost efficiencies (Morris et al., 2003; Wenzel, Wagner, & Koch, 2017).

**BMs' integrative framework.** Morris et al. (2003) distilled from all these theories a generalizable BM framework that is applicable to all firms and serves individual firm requirements without necessarily oversimplifying a firm's BM. The authors focused on three decision levels: foundation, proprietary, and rules and further provided specifics within each of the levels. At a foundational level, business leaders

need to make decisions of what the business is and is not, what products and services to offer. At the proprietary level, business leaders make decisions unique to the firm based on business leaders' value creation aspirations in light of core capabilities available to the firm. At the rules level, business leaders provide rules or guidelines to shape the business operations and influence what strategic and investment decisions are made at the foundational and operational levels (Morris et al., 2003).

**Foundational level.** The core logic of this BM level is to define the basic components of the business covering six critical aspects: value proposition, customer, internal processes and competencies, value capture (profit logic), competitive strategy, and growth and time objectives of the entrepreneur (Morris et al., 2003). All entrepreneurs have to address these generic elements covering the what of the firm as opposed to the how.

1. **Value creation:** this encompasses the product/service offering of the firm and how that value will be delivered to the customers. This is summarized as the firm's value proposition.
2. **Customer:** this covers the market the business leader chooses to compete and they customer types, geographic coverage and the customer requirements.
3. **Core competencies:** this aspect captures the business' internal capabilities and skills set that lie at the heart of the business.
4. **Marketplace positioning:** this aspect covers how the business will position itself relative to the competition based on its points of difference to establish is durable.
5. **Value capture:** the business logic for making money premised on four elements of (a) the operating leverage of the firm based on the fixed and variable costs

structure, (b) high or low volume business format, (c) business profit margins aspirations, and (d) revenue model.

**Entrepreneur's time, scope, and size ambitions (investment model):** given that not all entrepreneurs have the same aspirations, BMs are similarly customizable to the entrepreneur's business aspirations. There are four models of (a) subsistence: in it for meeting basics of survival, (b) income model: to generate stable ongoing income streams, (c) growth model: growth oriented to maximize on capital growth, and (d) speculative model: to demonstrate the value and growth prospects of the business and sell it (Morris et al., 2003).

**Proprietary level.** This BM stage obtains from entrepreneurs creating unique combinations that are specific to their business to create durable points of difference and sustainable advantage that make a difference to the foundational level elements (Morris et al., 2003). The customization of the proprietary level elements means that replication of the BM by the competition is not easy.

**Rules level.** At this stage, the entrepreneur creates rules that govern the BM that are reflected as strategic actions or strategic rules (Wells, 2016), or priority rules (Hyytinen, Pajarinen, & Rouvinen, 2015). Such rules inform decisions business leaders make regarding whom to partner and how to partner and distinguish firms with the same set of capabilities, resources and operating in the same market targeting the same customer segments (Morris et al., 2003).

**BM framework application.** Morris et al. (2003) provided an example of Southwest Airlines to demonstrate the BM framework in practice and exemplify how the airline's success was a function of the BM.

At the foundational level, the business leaders covered the what of the BM through:

- **Offering:** choice of selling services only through narrow standardized offerings and internal service delivery via direct distribution (Morris et al., 2003).
- **Market factors:** the BM is predicated on business to customer (B2C) via sales to individual travelers and business to business (B2B) via corporate sales.

**Internal capability factors:** the BM production and operating systems are structured to deliver on the offering and respond to the chosen target market.

- **Competitive strategy:** the BM presents the airline as a deliverer of operational excellence and dependable airline.
- **Economic factors:** the firm's revenue sources are fixed with high operating leverage based on high sales volumes at low margins.
- **Growth/exit model:** the BM is that of growth orientation aimed at maximizing the capital gains.

At the proprietary level, South West Airlines' model departs from other airlines BMs through innovation in how the airline operates in durable and sustainable strategic fit with a unique operating system enabling its business leaders to offer a unique value proposition (Morris et al., 2003). The core elements of the BM at the proprietary level are:

- **Offering:** high frequency short haul, low fare, fully refundable fares served directly to customers with no travel agents involved and no business class seats.
- **Market factors:** targets its services to 59 airports in 30 states to carefully chosen cities that best fit the airline's business operating model.

- **Internal capability factors:** employees chosen for best fit and airline less congested and low-cost airports in small cities with no code sharing with any other airlines.
- **Competitive strategy:** points of difference around on time arrivals and departure, low fares and fun-filled service.
- **Economic factors:** high volume low cost fares delivered efficiently at a profit despite industry downturn.
- **Growth/exit model:** the business leaders pursue a growth model.

At the rules level, the business leaders are guided by a set of strategic and tactical rules that delimit the management actions to maximize the effectiveness of the BM (Morris et al., 2003). The strategic and tactical rules are applied as follow:

- **Offering:** how much should be charged for a route and food costs per passenger.
- **Market factors:** which cities to ply and attaining at least 85% market penetration in local markets.
- **Internal capability factors:** managing at least 20 departures per day from each airport, the maximum distances to be travelled a day, maximum flight time and maximum flight turnaround times in every airport (Morris et al., 2003).
- **Competitive strategy:** the firm's pursuit of best on time record in the industry.
- **Economic factors:** cost per passenger mile standard in dollar terms.
- **Growth/exit model:** setting the growth rate of the firm and return on investment.

**Internal and external fit.** For BM sustainability, internal and external fit are required with the former concerned with how internal configurations or logics suit the firm's activities and the latter seeking an appropriate match between the firm's core

logics with the external environmental conditions (Morris et al., 2003). An example of an untenable BM is that of an MNC agribusiness seed company BM that is predicated on high operating leverage and high margins trying to serve the low-income price sensitive smallholder seed customers. Small-scale agribusiness seed companies with low cost leadership operating at low margins fare better in serving the smallholder farmers. BMs will periodically require adaptation to match the changing external environment (Morris et al., 2003).

In support of the Morris' et al. (2003) framework, Spieth and Schneider (2015) outlined the specific elements that need to be accounted for under each dimension. For the firm's value offering or value proposition, the following elements apply: (a) target customers, (b) product and service offering, and (c) market positioning of the firm. The sum total of these elements pointed to what benefits the firm provides, whom it targets and its points of difference from the competition (Spieth & Schneider, 2015). For the value creation dimension, four elements are proposed as (a) core competencies and resources, (b) internal value creation, (c) external value creation, and (d) distribution. The sum total of these elements provided insights into the resources and competences upon, which the firm's value offering are based, activities within and outside the firm's boundary that deliver that value and enable the firm to reach its customers (Spieth & Schneider, 2015). The firm's revenue logic or value capture innovation dimension is covered in two dimensions of (a) earnings logic and costs logic. These two dimensions serve to explain how a firm earns money and from, which revenue streams and manages its cost drivers.



**BM evolution.** A BM is not static and constantly evolves based on pressure from the external environment and changes in the business internal environment. BMs therefore go through episodes of “specification, refinement, adaptation, revisions, and reformulation” (Morris et al., p.733). Morris et al. summarized BMs as providing entrepreneurs with a framework for (a) their strategic choices in what to offer and to whom and how, (b) creating unique combinations particular to the resource endowments of the firm (c) developing activity sets suitable for the strategic choices they made earlier, and (d) balancing the alignment of elements of strategy, business logic, economics, and the growth or exit model (Morris et al., 2003). A BM is therefore important for guiding entrepreneurs and employees on how to deploy the business capabilities to respond to the market conditions to meet the growth aspirations of the entrepreneurs (Morris et al., 2003).

**BMI definition.** BMI focuses on the BM as the subject of innovation and is defined as innovating the theory of the business as a strategic innovation to improve an existing BM or create a new BM (Kranich & Wald, 2017). At the heart of the BMI is a quest to change the business to reposition the firm through creating new or expanding existing markets through existing or new value propositions (Kranich & Wald, 2017). While such innovations were already covered in literature (Fjeldtsad & Snow, 2018; Fritz, 2017; Schumpeter, 1934), a BMI is also about pursuing and exploiting opportunities as a dynamic capability (Kranich & Wald, 2017).

**BMI constituents.** BMs still lack conceptual elaboration despite gaining importance in scholarly and management circles (Schneckenberg et al., 2016). In spite of this lack of conceptual clarity, there is agreement among researchers that the constitutive

elements of BMs are (a) value proposition: what organizations deliver to their customers from the perspective of the customers (demand), (b) value creation: what companies deliver to the market in the form of new products and services (supply), and (c) value capture: how firms generate revenues, manage costs, and make profits (prices over total production costs) (Schneckenberg et al., 2016).

**BMI definition.** Foss and Saebi (2017) posited that the unifying definition of a BM and BMI are premised on stressing the architecture of the firm's value creation, delivery, and appropriation mechanisms. The authors define this firm architecture as a "set of relations among elements in a system through directionality, complementary, and information content" (p.5). In that regard, Foss and Saebi (2017) developed a four type BMI typology model premised on the scope (modular versus architectural) and novelty (new to firm versus new to the industry). First in this typology is evolutionary business innovation, which maps naturally occurring changes that occur in a company. Second, is the adaptive BMI, which entails complete BM changes that are new to that firm but already exist in the industry. Third, is the focused BMI, which is a new innovation in which the firm seeks to secure new markets not covered by its competition such as was the case with Nintendo launching Wii to non-gamers evading competition from Microsoft's Xbox and Sony's PlayStation (Foss & Saebi, 2017). Fourth, is the complex BMI, which is primarily driven by new industry entrants such as Uber and Airbnb, which disrupt the entire industry.

Spieth and Schneider (2015) defined BMI as innovation focused on the business as a unit of analysis as separate from product and process innovation. A number of factors drive BMI with globalization, rapid technology developments, deregulation,

customers willingness to pay, and sustainability pressures considered key and influencing business leaders BMI decisions (Spieth & Schneider, 2015). At the heart of BMI are considerations of how to achieve superior growth rates, how to capture significant value from innovations and maximize on the firms' resources and capabilities.

Schneckenberg et al. (2016) refers to BMI as the design of new BMs in new firms or reconfiguration of existing BMs (Schneckenberg et al., 2016). Researchers agree that BMI is much more complex than product or service innovation as the unit of focus is the business itself not just its products or services (Schneckenberg et al., 2016). BMI therefore presents ambiguous and uncertain situations for managers of incumbent firms as such business leaders need to understand the value drivers and their interdependencies and make decisions that will maximize resources available to the firm. Similarly, business leaders of new or entrepreneurial firms have to content with establishing new innovative BMs that will be accepted in the market and can attract the required resources to their business ventures (Schneckenberg et al., 2016).

In the context of such uncertainty, business leaders respond with coping mechanisms through strategic moves such as customer engagement and close alignment with supply chain partners in new product development environments. In the context of BMI, Schneckenberg et al. (2016) identified five coping strategies that business leaders adopt to craft new value propositions, deliver value creation, and establish new value capture mechanisms. The five strategies are (a) customer centricity: better understanding the customers' requirements to inform the firm's value proposition, (b) value co-creation: engaging the customers as part of the value network to design new value propositions, (c) capability evolution: adding to the firm's core capabilities to enhance how the business

can respond to shifting market conditions, (d) ecosystem growth: growing the range of ecosystem partners to enhance the firm's value creation, and (e) adaptive pricing: to enhance the firm's value capture mechanisms.

As firms get established and get profitable from particular BM configurations, they run into resource allocation constraints stemming from structural and processual inertia as routinization sets in to maximize on profits (Schneckenberg et al., 2016). New BMs are therefore considered too risky particularly when the incumbent firms have a working value creation and value capture formula. BMI implies breaking the existing value creation and value capture formula in favour of developing new value creation, value proposition, and value capture configurations that are different from the existing profitable operations and established organisational routines and processes (Schneckenberg et al., 2016).

**BMI elements.** There are arguments as to what actually qualifies as BMI (Foss & Saebi, 2017). One school of thought is that only innovations that results in new markets or extending present markets to cover new customers with new value propositions should qualify as BMIs (Joffre, Klerkx, Dickson, & Verdegem, 2017; Schuessler & Dubinsky, 2016). Another school of thought is that BMI is an internal firm activity, which should lead to rearranging of the BM elements. Based on all these arguments, a BMI is defined as alterations effected on the BM components that result in innovations in the firms' value proposition, value creation, value capture in a distinguishable manner (Claus, 2017; Souto, 2016).

**Customer centricity.** In line with changing customers' needs and behaviors, business leaders seek to closely align their value propositions to the needs of the

customers. The resultant close alignment is generation of higher profits driven by improved customer value. Inherent in this coping mechanism is the business leaders' investment in closely monitoring customers behaviors and needs (Schneckenberg et al., 2016).

**Value co-creation.** Business leaders cannot generate value creation propositions purely from a supply side perspective. Rather, value creation offers have to be steeped in what customers need and hence business leaders cope with uncertainty by actively engaging and collaborating with customers to co-generate value meaningfulness to the customers (Schneckenberg et al., 2016). Customer centricity and value co-creation underpin the business leaders' coping strategies with uncertainty to reconfigure the firm's value propositions.

**Capability evolution.** As business leaders seek to revamp their value creation activities, they resort to adding to their arsenal of know how (capabilities) from a technological and structural perspective. Business leaders also have to shed redundant capabilities and reorganize the firm's value creation activities through internal change management efforts (Schneckenberg et al., 2016).

**Ecosystem growth.** Innovation often spans company boundaries and the range of players in a firm's ecosystem determine the array of capabilities business leaders can tap into for enhancement of their value creation activities. External perspectives are therefore necessary in BMI as there are interdependencies among firms and their BMs. Expanding the range of value network partners through an innovation ecosystem therefore expands value creation capabilities of the business leaders (Schneckenberg et al., 2016).

Complementary capabilities and knowledge contribute to better value creation outcomes and reduced risk for the incumbent firm.

**Adaptive pricing.** Business leaders need to capture the value of all other value proposition and value creation investment. For new firms, value capture represents attraction of debt or equity capital to finance the business venture as well as generating the right revenue streams. For incumbent firms, the BMI have to be underpinned by better revenue streams at a better profit formula than the incumbent BM. Business leaders therefore have to overcome customer inertia, which can serve as an adoption barrier stopping customers from taking up the new value proposition (Schneckenberg et al., 2016). Other typical challenges business leaders have to cope with are customers comfort in stable forecasting of their expenses, which the new BM may seek to destabilize through flexible payment options or going after untapped market segments (Schneckenberg et al., 2016).

**Summary.** How business leaders cope with uncertainty is dependent on, which value element of the BM they seek to reconfigure. It does not necessarily follow that all three value elements of the BM need to be reconfigured. Customer centricity and value co-creation drive value propositions and seek to align the customers' needs and expectations to what the firm delivers as its value proposition. Business leaders therefore need up to date market analytics to constantly reconfigure their value propositions (Schneckenberg et al., 2016). Capabilities of the firm and ecosystem growth are requisites for the firm's business leaders to gain complementary skills and reduce risks of generating new value creation elements. Adaptive pricing enables business leaders to maximize on the firms' value capture elements by overcoming customer inertia and

adoption barriers as well as reaching untapped market segments (Schneckenberg et al., 2016; Verdu-Jover, Alos-Simo, & Gomez-Gras, 2017).

**Challenges of defining BMs.** Foss and Saebi (2017) concluded that the BMI research stream has so far fallen into four streams of (a) conceptualizing BMI through definitions and conceptualizations of BMI, (b) BMI as an organizational change process covering such as aspects as stages of BMI and organizational capabilities, (c) BMI as an outcome with a focus on the emergence of BMI in specific sectors and organizational forms, and (d) consequences of BMI performance. Foss and Saebi (2017) identified key strengths and weaknesses of the four research streams. On the strengths, the research outputs have enhanced understanding of the nature of innovation, its process dimensions and results of such innovation. On the weaker side, the BMI research was criticized for not showing characteristics of well-defined cumulative research as the research field has been siloed and not building on each other (Foss & Saebi, 2017). In particular, the definition of the unit of analysis was found wanting as some researchers looked at BMI as a process while others looked at BMI as an outcome.

Foss and Saebi (2017) proposed dimensionalization of BMI through a typology that classifies BMI across novelty and scope dimensions depending on whether the BMI is new to the firm or to the industry and whether the innovation was modular or architectural. In this approach, Foss and Saebi (2017) proposed addressed four research gaps. The first gap is that of defining and narrowing the dimensions of the BMI construct. The second gap is that of clearly identifying antecedents and outcomes of BMIs with the third being that of identifying the contingency and moderating variables of BMIs. The fourth gap is creating boundary conditions for BMIs into areas such as entrepreneurship

and BMI, open innovation and BMI, servitization, and BMI as well as sustainability and BMI. The research article was useful to my doctoral study in how it delineated different dimensions of BMI, which were necessary for the BM focus of this doctoral research.

**Innovativeness of BMs.** Spieth and Schneider (2015) built on the construct of product innovation and examined the dimensions of (a) newness of the BM, and (b) the specific BM dimensions to be considered in the newness. The authors argued that a BMI is characterised by a change to its existing BM configuration either to all or some of its elements (Spieth & Schneider, 2015). The newness of the BM therefore has to be premised on changes to the (a) value proposition or value offering, (b) value creation architecture, and (c) revenue logic or value capture (Spieth & Schneider, 2015). Based on these commonly agreed BM elements, the authors identified three BMI dimensions as (a) value offering innovation: newness of value proposition to meet existing but unfulfilled customer demands or generates new demand, (b) value architecture innovation: harnessing the firm' resources and competencies (internal and external) to generate new value creations, and (c) revenue model innovation: new ways of generating earnings and managing the BM cost structure for the highest possible profit (Spieth & Schneider, 2015).

**BM and BMI elements and definitions.** Three main dimensions of BMs are (a) value creation, (b) value proposition, and (c) value capture (Clauss, 2016; Gronum et al., 2016; Morris et al., 2003). Value creation is defined as the how and what mechanisms business leaders use to create value within the firm and in partnership with other firms (Clauss, 2016). Value proposition is defined as the array of solutions the firm offers to the consumers (Mateu & March-Chorda, 2016; Morris et al., 2003). Value capture is



defined as the mechanisms that business leaders use to convert value propositions into revenues and how they also manage the cost structure of the firm to achieve profits (Clauss, 2016). BMI tackles the innovation aspects of the business instead of the product and processes of the firm and inherently tackles the three BM dimensions of value proposition, value creation, and value capture (Brannon & Wiklund, 2016; Clauss, 2016).

**BMI dimensions and innovation sub-constructs.** The three BM dimensions of value creation, value proposition, and value capture have underlying sub-constructs that are important to consider in undertaking BMI measurement (Clauss, 2016). From an analysis of various BM and BMI articles, Clauss (2016) identified ten common sub-constructs underlying the three BM dimensions. The sub-constructs are (1) new capabilities, (2) new technologies/equipment, (3) new processes/structures, (4) new partnerships, (5) new offerings, (6) new customer segments/markets, (7) new channels, (8) new customer relationships, (9) new revenue models, and (10) new cost structures (Clauss, 2016).

- **New capabilities.** This relates to the firm acquiring new capabilities that enable the business leaders to explore, identify, and exploit new business opportunities.
- **New technologies/equipment.** The role of technology and equipment in BMI is in its capacity to innovate around new products, processes and services as well as offering new revenue models (Clauss, 2016).
- **New processes/structures.** Innovations in processes enhance cost efficiencies with resultant improvements to value propositions and value capture configurations of the BM.

- **New partnerships.** Business partners can be customers (in co-creation processes), suppliers or competitors or other players in the innovation ecosystem offering relational rents (Clauss, 2016).
- **New offerings.** When business leaders offer new solutions to meet their consumers' needs, the benefits are apparent to the market and these can obtain from new innovations.
- **New customers/markets.** The identification of consumers (new and old) willing to pay for the firm's value proposition is at the centre of firm competitiveness driven by products and service innovations.
- **New channels.** Innovations on how to deliver the value to the consumers can be point of difference in a BM with bricks and click models offering cost advantages (Clauss, 2016).
- **Customer relationships.** This speaks to the business leaders' ability to solidify existing relationships and build new ones with customers and the resultant innovations that can obtain from understanding the latent market needs and also the opportunities for creating lock-in relationships such as iTunes and Gillette razor and blades model (Clauss, 2016).
- **New revenue models.** This innovation sub-construct is about how to extract value from the customers through increasing the range of revenue streams and mechanisms for customers to pay for the products and services offered.
- **New cost structures.** This innovation is about how to manage the direct and indirect costs and aligning the product-market strategy to ensure that innovations in other sub-

constructs remain within the cost structure that assures the profitability of the business (Clauss, 2016).

**BMI typologies.** Taran, Boer and Lindgren (2015) examined ten case studies of BMI to generate BMI typologies. Taran et al. noted the importance of BMI as organizations face global competition, which has shortened product and BMI lifecycles. The authors further noted that key organizational successes such as those of Apple, Microsoft, Ryanair, Skype and Zara have come about as a result of BMI. They further explored BM innovativeness, radicality, reach, and complexity along with the organisational context within, which the BMI took place and the resultant enterprise performance.

Taran et al. (2015) conducted 10 retrospective case studies of BMI conducted by two industrial companies. The authors used a BMI analytical framework focusing on innovativeness (innovation content, BM building blocks, innovation depth of the BM and strategic and organizational context (how innovation supports business strategy, open versus a closed approach to innovation and measures of BM success). From the innovativeness/innovation building blocks, Taran et al. established the constructs of value proposition, target customers, customer relations, value chain architecture, core competences, partner network and the profit formula as key attributes of BMI. On the strategic context, the authors identified for organizational strategic typologies of prospectors, analysers, defenders and reactors.

The study made useful contributions to my topic in how the authors applied the retrospective case study approach to isolate the key driving constructs to BMI success. The research methodology offered me a viable approach for my study.

**BMI and dynamic capabilities.** Teece (2018) examined the link between BMI and a firm's dynamic capabilities and argued that a firm's BMs are dependent on the firm's capabilities. Teece's (2018) argument stemmed from the fact that maintaining competitiveness is predicated on the ability to design and adjust BMs. Such dynamic capabilities are broken down into two forms- micro-foundations and higher order capabilities (Teece, 2018). In the former, business leaders muster the operational and ordinary capabilities such as routine activities, administration, and basic governance for day-to-day business operations (Teece, 2018). In the latter, it includes capabilities in the domain of new product development and "astute managerial decision making under uncertainty" including new BM design (Teece, 2018, p.2). It is within the higher order capability domain that business leaders exercise the sensing, seizing, and transforming competencies and generate BMIs.

Teece (2018) also provided a useful breakdown of BMI through the value creation, value delivery, and value capture dimensions (Teece, 2018). Additionally, Teece (2018) articulated the three main categories of a BM as (a) value proposition: product and service, customer needs, and geography of focus; (b) revenue model: pricing logic, channels, and customer interaction; and (c) cost model: core assets and capabilities, core activities, and partner networks. One caveat is that the first mover advantage with an imitable BMI does not necessarily confer advantages to the incumbent firm. Using the containerized shipping as an example, Teece (2018) outlined how Uber through waiting for the standards and technology of the sector to mature and then moving in with higher order dynamic capabilities allowed its business leader to introduce a BMI that enables the company to earn higher revenues than the incumbent taxi industry operators yet without

the need to keep expensive assets on its books but using technology, strategy and BMI coherence (Teece, 2018).

**Functions of BMs.** Spieth and Schneider (2015) proposed three major functions of BMs as (a) description of how a firm conducts its business- this represents the logic of the firm and design architecture depicting how the business creates, delivers and captures value (transactive structures), (b) opportunity creation/facilitation, identification and development- how a firm is organized to pursue opportunities in its environment, and (c) commercializing ideas and technologies- how the business leaders link innovation and value creation and convert it to value capture.

**BM dimensions and elements.** Scholars generated varied BM elements ranging from four to eight although the most recent BM elements have tended to narrow down to fewer elements of between three and five elements (Spieth & Schneider, 2015). Three BM elements are not contested: (1) value offering or value proposition: the firm's value proposition, target customers, and market positioning, (2) value creation architecture: competences and resources, transactional and organizational structure, value chain partnerships, and (3) revenue model or value capture: revenue and cost logics of the firm (Schneckenberg et al., 2016; Spieth & Schneider, 2015).

**Reasons for BMIs success or failure.** Christensen et al. (2016) conducted case analysis with Harvard University working with 26 successful and failed BMIs. Of the failed cases were nine industry-leading companies. All the cases were profiled, and all 26 companies were invited to share the experiences generated from the case the case analysis. From the case analysis, the authors developed the four-box framework of BMI covering four elements of (a) value proposition, (b) organizational resources, (c)

processes to convert inputs to finished products, and (d) profit formula. Their conclusion was that successful BMI focus on organizational priorities and capabilities. Also, BMI follows a pathway of creation, sustaining innovation, and efficiency with particular requirements for success under each on the priorities and capabilities parameters (von den Eichen, Alos-Simo, & Matzler, 2015). The studies contribute to my research topic in how Christensen et al. and von den Eichen et al. (2015) designed the case study approach and explored the cases of interest. The BMI framework they applied provided useful constructs for my case study questions and richly informed my research design.

**BMI pathways.** Cao, Navare, and Jin (2017) identified six distinct pathways of retail BMIs, which are (a) brand legitimization in export market, (b) resource sharing within a group, (c) knowledge transfer from head office to subsidiary, (d) alliance with local stakeholders, (e) imitating local competitors to fit in, and (f) innovating in the new markets. Cao et al. characterized these BMIs into three patterns based on their organizational learning capability in terms of exploitation and exploration and how the business leaders deployed home-based versus host country resources. Pattern 1 is dominated by business leaders' reliance on their home countries BM resources such as brand reputation, relationship with international suppliers and home-based retail distribution and technological options. Pattern 2 is dominated by business leaders whose BMIs are characterized by exploiting resources in the export market through strategic alliances with local stakeholders to customize their operations to the local markets. Pattern 3 is characterized by business leaders developing new products and services or BMs through a combination of both host country and international resources. The authors concluded that BMIs can be understood as innovative decision processes underpinned by

organizational learning, innovation and internationalization for sustained value creation and competitive advantage. The study was relevant to my doctoral topic in its application of the BMI conceptual framework in a multi-case study analysis.

### **Transition**

Section 1 consisted of the focus of the study, the strategies small seed company business leaders (BLs) and business executives (BEs), collectively called seed company executives, may use for closing the innovation gaps in smallholders' markets for market share growth. The first element of Section 1 provided a background of the business problem followed by discussion of the problem and purpose statements, nature of study, research questions and interview questions, conceptual framework, operational definitions, assumptions, limitations and delimitations, and the significance of the study. Section 1 also provided a review of the professional and academic literature, which highlighted the agribusiness seed system innovation gaps and the BMI models forming the conceptual framework for the study.

In Section 2, I will cover discussions on my role as a researcher, participants, research method and research design, population and sampling, ethical research, data collection instruments and techniques, data collection techniques, data analysis, and replicability and validity. In Section 3, I will include the study findings, the study's application to professional practice, implications for social change, recommendations for action, recommendations for further research, summary and reflections, and the conclusion.

## Section 2: The Project

Section 1 consisted of my focus in the study: the strategies that agribusiness BLs and BEs may use for closing the innovation gaps in smallholders' markets for market share growth. In the first part of Section 1, I provided a background of the business problem followed by discussion of the problem and purpose statements, nature of study, research questions and interview questions, conceptual framework, operational definitions, assumptions

### **Purpose Statement**

My purpose in this qualitative multiple case study was to explore strategies that small agribusiness seed company leaders use to close innovation gaps in smallholders' markets. The targeted population consisted of 10 agribusiness seed company chief executives and operations managers of nine small agribusiness seed companies and their staff located in Zimbabwe, Zambia, and Malawi, in southern Africa, whose primary markets are smallholder farmers. The leaders of these nine seed companies have demonstrated success in implementing strategies to close the innovation gap. The implications for social change are that the results of this study may offer improved seeds and food security for more than 51 million impoverished smallholder farmers across SSA.

### **Role of the Researcher**

A researcher in a multiple qualitative case study design is the primary research instrument (Farooq & de Villiers, 2017). As a primary research instrument, the researcher should seek to ensure that fieldwork is implemented to collect, organize, and analyze data in an integrated manner (Cronin, 2014; De Massis & Kotlar, 2014). I took responsibility



for the selection of the case studies, participants recruitment and their orientation on the research objectives, as well as gathering and analyzing information. I was therefore responsible for (a) creating an interview protocol, (b) contacting potential research participants, (c) obtaining information necessary to answer the research question through open-ended questions, (d) identifying themes, and (e) analyzing and writing up the study results. I considered the participants' perspectives and also the context of the study as recommended by Cronin (2014) and De Massis and Kotlar (2014). In this regard, I used multiple data collection methods, including an interview guide to conduct personal interviews ensuring adherence to interview protocols.

I also made observations and extracted company records and artifacts to ensure adherence to high ethical standards and procedures to mitigate personal bias and enhance the overall reliability of my study as recommended by De Massis and Kotlar (2014). Given that I undertook data collection through a range of methods such as observation, interviews, and written materials, I needed to establish a trusting connection with research participants. The data collection methods require researchers to establish a connection with their respondents to the extent that the researchers understand what is going on in the respondents' minds, their ideas, and thoughts to sufficiently interpret the respondents' understanding into meaningful research findings (Chowdhury, 2015).

My role as a researcher was to explore strategies that small agribusiness seed company leaders use to close innovation gaps in smallholders' markets. It was critical for me to mitigate intentional and unintentional bias to the extent possible. Fusch and Ness (2015) noted that a researcher brings their worldview to social research and, therefore, can intentionally or unintentionally introduce bias through their cultural and experiential

background. The aspect of interviewer bias stems from the fact that the researcher is the data collection instrument and is immersed in the data collection process combining the researcher's perspectives and those of the study participants (Fusch & Ness, 2015; Roulston & Shelton, 2015). To guard against personal bias as a researcher, I first needed to ensure that the views and interpretations of views I generated remained centered on the participants. Second, I needed to acknowledge my personal bias and remain vigilant to distance my personal views from those of the participants in the data collection process. I used an interview protocol and diligently applied it and also complemented the protocol with member checking and a rigorous pursuit of data saturation as recommended by De Massis and Kotlar (2014) and Fusch and Ness (2015).

Utilization of open-ended questions combined with excellent listening skills, and where necessary guiding the discussions with follow-up questions while minimizing distractions through note taking enables a researcher to remain connected to the research participants (Rosenthal, 2016; Yin, 2018). In this regard, I sought to use the interview questions as a guide to the data collection process and collected information that is relevant in answering the research question and collected a reliable chain of evidence.

Sourcing various data from different sources offers an unparalleled combination of both objective and perceptual data offering both subjective or interpretive and more factual information. Such an integrative approach enables researchers to generate a deeper understanding of organizational processes and outcomes not chosen from other research methods and, therefore, offers data credibility (Baskarada, 2014; De Massis & Kotlar, 2014). To manage bias and enhance validity, I used confirmation through data integration to allow me to triangulate data and reduce post hoc rationalization and

personal interpretation biases from interviewees. The combination of data collection through a semistructured interview guide, structured data analysis, triangulation of data sources and analysis of data in an integrative manner enhances construct validity, credibility, and research reliability (De Massis & Kotlar, 2014). I also used member checking to assure the validity, credibility, and accuracy of my research findings as recommended by Fusch and Ness (2015) and Harvey (2015).

Such an approach enabled me to effectively use a triangulation method allowing adoption of different angles to data collection and analysis of the same phenomenon from multiple dimensions creating credibility of the findings. I equipped myself with the appropriate skills in the different methods of data collection through practice in my work as I applied my doctoral classes to my work with agribusiness companies in comparable geographical areas. The triangulation methods are useful only to the extent that a researcher is sufficiently knowledgeable and able to apply the data collection methods (De Massis & Kotlar, 2014).

As a seasoned business analyst and agribusiness consultant, I brought familiarity to the research topic as well as experience with design and implementation of agribusiness BMI strategies. Besides my 20 years managerial and technical experience in agribusiness, I have helped business leaders to set up and grow agribusiness seed companies in eastern, western, and southern Africa. I brought my own experience in agribusiness BMI strategy development complemented by an extensive review of the literature on the topic of agribusiness seed businesses and BMI in smallholders' market.

The Belmont Report of 1979 established the standards for ethical principles for the protection of human subjects in research studies with respect for persons,

beneficence; and justice as hallmarks of the research standards (Wessels & Visagie, 2015; Zucker, 2014). In this research study, I committed to upholding the highest ethical principles guided by The Belmont Report.

### **Participants**

My collection of data for this study followed a multiple case study research design. Multiple case studies enable researchers to compare phenomenon across cases and determine if it is unique to one case or replicated across other cases. A multiple case study sample, therefore, within and across case analysis offers more deeply grounded empirical evidence (De Massis & Kotlar, 2014). I chose multiple cases for (a) literal replication: allowing for prediction of similar results, (b) theoretical replication: contrasting results across cases, and (c) elimination of alternative explanations (De Massis & Kotlar, 2014). I collected data from small-scale agribusiness seed company leaders covering ten participants comprising BLs and BEs until I achieved data saturation. A small or large sample size is not necessarily a measure of data saturation and therefore I remained open to the number of participants going up or down depending on when I reached data saturation. I conducted interviews until I achieved data saturation as guided by Wakefield and Blodgett (2016). The balance between depth and breadth always must be maintained, and choice of information-rich cases is a better consideration than the number of cases to study (Fletcher, Zhao, Plakoyiannaki, & Buck, 2018). Another caveat is that the number of cases can be modified during the fieldwork as a function of simultaneous data collection and analysis and the pursuit of data saturation.

Fusch and Ness (2015) asserted that data saturation is attained when three conditions are met. First, the research has to generate enough information such that no

new data is being generated. Second, there should be no new codes and new themes emerging from subsequent data collection (Tran et al., 2016). Third, the existing data set from the data collection processes should have generated enough information to replicate the study. The number of interviews was not going to be the primary determinant of data saturation in my study as few information-rich interviews could be enough to attain data saturation.

The cases that I covered in my research study were chosen based on their capacity for stronger explanation and rare or unique qualities in how small-scale agribusiness seed company business leaders innovate in the smallholders' market. There are not that many seed companies (SCs) that have been able to penetrate the smallholder seed market with most smallholder farmers having to rely on using inferior retained seeds (McGuire & Sperling, 2016). I expected to gain unique access into the operations of these companies and their BMI strategies to penetrate the smallholders' market. The firms of focus met the criteria of (a) having been in operation for more than 5 years, (b) having successfully introduced innovation into the smallholders' market, (c) operated in the southern Africa region, and (d) have fewer than 50 employees.

In addition to the business leaders, I also included business executives who are management staff (BEs) of the seed companies. Two dimensions of BLs and BEs informed my sampling from the seed company executives. The first layer was business leaders that have equity in the firms and are founding business leaders of the agribusiness seed companies. The second layer was BLs that are directly and actively involved in the design and implementation of the BMI strategies in smallholders' market on behalf of BLs. These layers of an investigation offered me enough distinct windows of case

observation in a peculiar way than has been researched before in companies led by BLs and BEs that have been able to demonstrate a track record of BMI in smallholders' markets.

I encouraged voluntary participation while also informing the participants of the potential benefits of the research, and the use of my extensive network in the agribusiness seed industry, while guaranteeing the participants confidentiality as recommended by Baskarada (2014) and Yin (2018). These arrangements offered a good overview of the company formulation and BMI strategy implementation from the founding BLs and BEs involved in the strategy formulation and implementation. Mealer and Jones (2014) proposed researchers to reach out to potential participants through email requests explaining the research purpose and indications of time investment requirements on the part of the participants. I sent emails to potential participants providing background information on the study, options for interview times and locations, and instructions for giving informed consent in line with suggestions by Mealer and Jones (2014) and Yin (2018). In line with ethical standards, I kept the participants identities confidential and referred to the companies as BL 1, BL 2...BL 3 or BE 1, BE 2 as recommended by Mealer and Jones (2014) and De Massis and Kotlar (2014).

Although recruitment of participants is essential, equally important is the continued voluntary engagement of participants in the research (Cronin, 2014). My knowledge of the agribusiness seed industry and knowledge of the operating context of my participants enabled me to allay any anxieties participants may have had about the research and enabled the creation of a relaxed environment for the collection of rich data from participants in a relaxed collaborative relationship allowing for in-depth

discussions. Maintaining a relaxed environment and collaboration with research participants is critical in qualitative data collection (Cronin, 2014; Rosenthal, 2016).

Exploring the BMI strategies used by business leaders of small-scale agribusiness seed companies is only as useful as the quality of the data provided by the participants. Knowledgeable BLs and BEs were essential to answering the research question because the quality and completeness of research findings are predicated on a selection of knowledgeable participants (Rosenthal, 2016; Yin, 2018). My choice of BLs and BEs as research participants provided knowledgeable key informants. The choice of business leaders that are founder members and are still running these agribusiness seed companies provided business continuity advantages and provided useful details and insights from the business founders' perspectives making these cases unique and strategic sites. BEs that were part of the leadership team in the formulation and execution of the BMIs were also included as participants. My reason for the choice of nine cases was, therefore, premised on deep access to the nine firms with unfettered access to the cases to investigate the phenomenon of interest. I recruited participants according to the clearly laid criteria above for business leaders' eligibility requirements recruitment and deployed an effective strategy to establish functional relationships with the participants and ensured strict adherence to the criteria. I was consistent in the application of the same interview guide for all research participants and ensuring that all selected participants were relevant to collect data that is relevant to answering the research question in line with guidelines provided by Cronin (2014) and De Massis and Kotlar (2014).

## **Research Method and Design**

The method of the study was qualitative. Unlike quantitative and mixed methods, using the qualitative method enables a nonlinear exploration of a study's central research question (Yin, 2018). Qualitative and contextual analyses of phenomena require more in-depth and focused attention on strategies driving change. Cross-sectional case study analysis can provide detailed phenomena analysis in a detailed manner (Yin, 2018). I did not select the quantitative method as its focus is on examining relationships or differences among variables by testing hypotheses. In addition, quantitative methods do not allow researchers to consider the contexts of participants' feelings, experiences, observations, and relevant documentation (Myers, 2013). I did not select the mixed-method research approach as I am not testing hypotheses as advocated by Larkin, Begley, and Devane (2014).

### **Research Method**

The application of qualitative research is mainly to answer the why question behind people's motivations in engaging in particular behavior and when a researcher is interested in better understanding a particular phenomenon from the participants perspective (De Massis & Kotlar, 2014; Rosenthal, 2016). Qualitative research is therefore useful for producing rich and descriptive analysis drawn from interpretation of data that is coded, sorted, sifted into themes and text into findings known as qualitative data analysis (QDA). QDA is defined as "a range of processes and procedures whereby a researcher moves from the data that have been collected into some form of explanation, understanding, or interpretation of the people and situations that the researcher investigates" (Chowdhury, 2015, p. 1136).



Data are collected through a range of methods such as observation, interviews, participation, and written materials. The data collection methods require researchers to establish a connection with their respondents to the extent that the researchers understand what is going on in the respondents' minds, their ideas, and thoughts to sufficiently interpret the respondent's understanding into meaningful research findings (Chowdhury, 2015). Data analysis is, therefore, an inductive process to extract meaning and symbolic content of the data and understand the reasons that govern human behavior.

### **Research Design**

The research design I selected for my study is a multiple descriptive case study. There is no universally accepted definition of a case study owing to different disciplinary perspectives and theoretical traditions (Fletcher et al., 2018). Fletcher et al. (2018) defined case studies as “meaningful and complex configurations of events and structures, which are treated as singular, whole entities purposefully selected” (p. 2). Case selection is, therefore, considered to be at the heart of case study research and therefore case study sampling is critical to the credibility of the research results.

Case studies fall into three main categories of explanatory case studies, exploratory case studies and descriptive case studies. The explanatory case study is applied when a researcher seeks to understand how a phenomenon takes place and is typified by a how question such as how is the product innovation process managed in a small-scale seed company? This particular case study design is for understanding why a phenomenon takes place. The exploratory case study is applied when a researcher seeks to understand particular organizational dynamics or social processes in a theory building context and applies a question such as “how do individual goals of organizational

members influence the organizational goals” (De Massis & Kotlar, 2014, p.16). It is possible to combine the why and how aspects of a case study in which case design could have both the why and how elements of case study design (De Massis & Kotlar, 2014). The descriptive case study design is normally applied to convince others that a particular phenomenon actually exists as it provides a rich evidence base applying such research questions as “are incumbent firms subject to organizational inertia when they develop radical innovations” (De Massis & Kotlar, 2014, p.16).

Using a multiple descriptive case study enables flexibility and adaptability, more so than other designs and enables analysis of a situation through picture and words as opposed to numbers (Merriam, 2014; Yin, 2018). Applying case study design principles enables researchers to explore more deeply into the unit of analysis (Yin, 2018). I used the case study design for flexibility, adaptability, and an in-depth exploration of the case. Yin (2018) stated that with unique cases, the researcher could derive comprehensive findings through a thorough study. Therefore, the qualitative method and multiple case study design were suitable to promote an in-depth exploration of strategies that small agribusiness seed companies BLs and BEs in Zimbabwe, Zambia and Malawi in Southern Africa use to close the innovation gap. Bocken, Schuit, and Kraijenhagen (2018) applied a multiple case study design to examine eight cases on how they developed circular BMIs in the green economy.

Case studies are one of the most adopted qualitative research methods in organizational studies for its relevance and rigor and as a robust research design in generating managerially relevant information (De Massis & Kotlar, 2014; Yin, 2018). The value of the case study design is in its ability to interrogate a topic in its real-life

setting in-depth allowing for in-depth analysis of dynamics of an organizational context through a variety of perspectives which would otherwise not be possible in quantitative research designs (De Massis & Kotlar, 2014). Its particular value lies in extracting “manifold variables embedded in the context of investigation” (p.16) and application of multiple sources of evidence through convergence and triangulation of data collection methods (De Massis & Kotlar, 2014). The case study design can be applied on its own or in combination with statistical empirical research designs to delve deeper into a given phenomenon.

Three aspects feature in case study research (a) a variety of sources of data, (b) study of the phenomenon in its context, (c) juxtaposing theory with reality on the ground (Fletcher et al., 2018). With the growing use of the case study method has been an equally growing concern about the biased samples used in research with the research results questioned. Cuervo-Cazurra, Andersson, Brannen, Nielsen, and Reuber (2016) emphasized the importance of case selection to generate trustworthy qualitative evidence and place emphasis on the careful selection of case studies. My case selection methods were based on strict criteria to conform to the study objectives.

**Data triangulation and data saturation.** Data triangulation leads to data saturation (Fusch & Ness, 2015). Triangulation is defined as a method for data saturation in which a researcher deploys multiple data collection and analysis methods to the same empirical events (De Massis & Kotlar, 2014; Fusch & Ness, 2015). Collecting data from multiple sources and integrating the analysis of those data can be critical data triangulation to enhance the reliability of the research results and obtaining data saturation (Fusch & Ness, 2015). Triangulation can take four forms of (a) research

triangulation: where multiple researchers correlate their findings in the same study, (b) theory triangulation: use of multiple theoretical strategies, (c) methodological triangulation: comparing data from multiple sources, and (d) multiple external analysis: cross-checking events through different data sources and analysis (Fusch & Ness, 2015). For my research study, I applied the theory, methodological and multiple external analysis approaches to data triangulation.

**Data saturation.** Content validity is a function of data saturation, and failure to attain it weakens the research quality (Fusch & Ness, 2015). Data saturation is attained when three conditions are met. First, the research process has to generate enough information such that no new data is being generated. Second, there should be no emergence of new codes and new themes. Third, there should be enough information to replicate the study (Fusch & Ness, 2015). The number of interviews is not the determinant of data saturation as few information-rich interviews may be enough to attain data saturation. Therefore, data saturation is a function of the richness and thickness of data as opposed to the size of the sample. Richness is considered concerning the quality of information obtained while thickness is considered concerning the quantity of the information and obtaining both is the best option (Fusch & Ness, 2018). Fusch and Ness (2015) recommended the use of a saturation grid that lists the major topics on the vertical axis and the interviews to be covered on the horizontal axis.

**Why other designs were inappropriate.** To address the purpose of this study, I considered case study, phenomenological, and ethnographic research designs. Using the phenomenological design enables the researcher to explore aspects surrounding a specific phenomenon and participants' lived experience (Marshall & Rossman, 2016). The

phenomenological design was unsuitable as my study was not about the meanings of participants' lived experiences. The ethnographic research design is primarily about the exploration of the beliefs and behaviors of culture-sharing groups (Marshall & Rossman, 2016). I did not want to focus on characterizing a culture as it pertains to the beliefs and behaviors of people; therefore, I did not select an ethnographic design for my study.

### **Population and Sampling**

The critical considerations for the sampling of participants for my research were (a) appropriateness, (b) purpose of the research, and (c) access to information-rich cases from which to obtain vital information for the phenomenon of study as guided by Fletcher et al. (2018) and Patton (2015). Fletcher et al. (2018) identified two core case study sampling approaches of theory-driven versus phenomenon driven sampling strategies. The theory-driven sampling strategies draw from a deductive approach where sampling seeks cases that exhibit previously established relationships with theoretical concepts or constructs. The purpose of such sampling is to draw cases that inform the refinement or generation of theoretical models. The case study units are selected before the project starts and are chosen because viable for extending and revising relationships with theory (Fletcher et al., 2018). The phenomenon driven sampling strategies seek to observe real-life phenomena and apply inductive theorizing logic. Such sampling seeks deep immersion into the phenomena to identify, document phenomenon to inform knowledge creation (Fletcher et al., 2018). Three considerations come into play in the choice of a case study. These are the (a) sampling strategies, (b) unit of analysis, and (c) sample size (Fletcher et al., 2018).

**Case selection strategies.** Within the phenomenon driven sampling strategies, there are several case selection strategy options for my consideration. Based on international business research experiences in case study sampling strategies, the top four sampling strategies are (a) criterion: cases that meet preset criteria, (b) maximum variation: cases with diversity in terms of predicted outcomes, (c) convenience: easily accessible cases, and (d) extreme deviant/outlier: to learn from unusual cases or extreme outcomes cases (Fletcher et al., 2018). In my case, I applied the extreme deviant/outlier strategy as I sought agribusiness seed company leaders that have adopted BMI to address the smallholders' market, unlike the typical seed company leaders that are struggling to make a foothold in the smallholders' market segment.

The cases I chose for my research were meant to reflect a phenomenon that lacks present theory or empirical evidence. However, it is worth noting that this does not mean complete absence of theoretical basis, the base is always some theory, but the distinction is that these cases reflect aspects not previously identified in relationships between phenomena and theory (Fletcher et al., 2018). The cases can be selected during the research process after the project has started.

My choice of a study sampling strategy was the purposeful sampling strategy informed by selecting information-rich cases that have the best chances of providing insights into the research question under consideration as recommended by Fletcher et al. (2018). I applied the phenomenon driven selection method where firstly, case selection represented the companies that have designed and implemented BMIs in smallholders' market and cases that I chose represented that phenomenon. Second, the cases I chose captured variations from the norm without predetermined theoretical assumptions. My

focus was to secure cases that are information rich that show the BMI phenomenon under study. Third, I kept my case selection dynamic to ensure that I choose cases that illuminate the BMI strategies of small-scale agribusiness seed company BLs and BEs.

**Unit of analysis.** The unit of analysis is the focal entity of study constituting the what or whom the case is studying (Fletcher et al., 2018). There are four general classifications of units of analysis namely; (a) social units- individuals, organisations, communities, (b) temporal units- epochs, events or processes occurring in defined time periods, (c) geographical units- countries, regions, and (d) artefacts- books, photos, buildings, seed samples (Fletcher et al., 2018). Analysis of case studies can be at a single unit often referred to as holistic case study analysis or at multiple units of analysis often referred to as embedded case analysis (Fletcher et al., 2018). The former can be done when a case study analyses a single seed company whereas the embedded case analyses would analyze and present data for the seed company at multiple levels covering management, supervisors, customers and so forth while according equal importance to all levels of analysis (Fletcher et al., 2018). The importance of the unit analysis is to determine the sampling strategy to be applied as well as the study sample itself.

A unit of analysis is defined as the case or “a phenomenon of some sort occurring in a bounded context” (De Massis & Kotlar, 2014, p.17). Case study analysis can be at the individual, organizational members, a group of individuals, a process, programme, the firm, a group of firms. A unit of analysis needs to be clarified in every case. In my case, my unit of analysis is the innovation strategies of small-scale agribusiness seed company BLs and BEs. My unit of analysis was, therefore, the leadership and organization of BM strategy innovation in this group of firms. However, beyond the business leaders, I was

also interested in BEs in seed companies, and therefore I had multiple units of analysis comprising BLs and BEs in small agribusiness firms (seed company executives).

**Adequacy of sample size.** The adequacy of sample size is relative and always dependent on the purpose of the study and the availability of resources and the sampling strategy employed (Fletcher et al., 2018). The balance between depth and breadth always has to be maintained, and choice of information-rich cases is a better consideration than the number of cases to study (Fletcher et al., 2018). The other caveat is that the number of cases can be modified during the fieldwork as a function of simultaneous data collection and analysis and the pursuit of data saturation.

**Data Saturation and Sampling.** Saturation is a function of no new additional information being generated as Morse said, “heard it all” (Malterud et al., 2015, p.7). Information power is a function of internal validity “influencing the potential of the available empirical data to provide access to new knowledge employing analysis and theoretical interpretations” (Malterud et al., 2015, p.5). Content validity is a function of data saturation, and failure to attain it weakens the research quality (Fusch & Ness, 2015). Data saturation is attained when three conditions are met: the research has generated enough information such that no new data is being generated or new codes and new themes are emerging, and there is enough information to replicate the study (Fusch & Ness, 2015). The number of interviews is not the determinant of data saturation as few information-rich interviews may be enough to attain data saturation. Therefore, data saturation is a function of the richness and thickness of data as opposed to the size of the sample. Richness is considered regarding the quality of information obtained while thickness is considered regarding the quantity of the information and obtaining both is the



best option (Fusch & Ness, 2018). Fusch and Ness (2015) recommend the use of a saturation grid that lists the major topics on the vertical axis and the interviews to be covered on the horizontal axis.

### **Ethical Research**

*The Belmont Report* published in 1979 (National Commission for the Protection of Human Subjects in Biomedical and Behavioral Research, 1979) established the standards for ethical principles for the protection of human subjects in research studies with respect for persons, beneficence; and justice as hallmarks of the research standards (Zucker, 2014). In my research, I committed to upholding the highest ethical principles guided by Koonrungsesomboon, Laothavorn, and Karbwang (2015) in line with *The Belmont Report*. I particularly paid attention to the three aspects of *The Belmont Report* protocol of (a) autonomy: participants right to participate or not participate in the research, (b) beneficence: the need for the researcher to minimise the risks or harm to participants, and (c) justice: in cases where participants stand to benefit from the research provided by Zucker (2014). In line with provisions made by Honig, Lampel, Siegel, and Drnevich (2014), I adhered to *The Belmont Report* protocols in the IRB applications and follow-up field work as provided for in the approved research proposal. My IRB approval number is 10-01-18-0607796 expiring on September 30, 2019

I followed the informed consent process outlined by Anderson and Cummings (2016) to (a) explain the purpose of the study and its potential benefits to the participants, (b) the study procedures and time investment requirements, and (c) the voluntary nature of the study. To ensure transparency, I shared information with research participants via email followed up with a call to explain (a) participants rights, benefits and risks of

participating in the study, (b) compensation arrangements, (c) confidentiality of the participants, and (d) contact information for further information on the study should they require it (see Appendix B). In addition to the informed consent form, I also indicated to the participants the expected time required to participate in the study and their permission to record the interviews. I sought consent via email responses before conducting any interviews. The list of documents I shared with the participants (see Appendix B) includes the informed consent form, an information data sheet, and an abstract of the purpose of the study, interview process, and confidentiality procedures as recommended by Haahr, Norlyk, and Hall (2014) and O’Cathain et al. (2014). I made an appointment with each willing participant who was over 18 years of age and assigned a research number to each participant. I at all times encouraged voluntary participation while also informing the participants of the potential benefits of the research, and the use of my extensive network in the agribusiness seed industry, while guaranteeing the participants absolute confidentiality in line with guidelines from Baskarada (2014), Rao (2016), and Yin (2018).

In line with research ethical standards, I also kept the participants identities confidential to protect the participants and referred to the participants as BL 1, BL 2, BL 3...BL 5 or BE 1, BE 2...BE 5 as suggested by Mealer and Jones (2014) and De Massis and Kotlar (2014). An additional aspect of maintaining participant confidentiality is data storage. I stored the electronic data on a personal external hard drive and protected it with a password. I have also stored the data in a locked cabinet for my sole access. I will store the data from participants for 5 years after which I will destroy all the data. Data

preservation is critical for participants' privacy and protection of their rights (Beskow, Check, & Ammarell, 2014; Yin, 2018).

While recruitment of participants is essential, equally important is the continued voluntary engagement of participants in the research (Cronin, 2014). Participants should be provided with the option to withdraw from the research should they so wish (Haahr et al., 2014). I informed the participants that to withdraw from the study, they have the option to inform me via email or phone at any time before, during, or after the interview, without any penalty. Should a participant withdraw from the study, I will shred the data from their company and provide them with written confirmation of the same. I also did not compensate participants for their participation in the study. The dangers of financial compensation lie in creation of perverse incentives among participants to fabricate data during interviews (Robinson, 2014). I asked the participants to confirm their willingness to participate in the study by responding "I consent" to my email inviting them to participate in the study. It is only when I had received that consent that I contacted participants by telephone to schedule a day and time for the interview.

### **Data Collection Instruments**

**Collecting information.** I was the primary data collection instrument. Sutton and Austin (2015) highlighted that the researcher is the primary data gathering instrument in qualitative research. The researcher seeks to obtain rich and thick data (De Massis & Kotlar, 2014). I collected data from business leaders and business executives from small-scale agribusiness seed companies with experience in BMI in the smallholders' market. The participants are collectively referred to as seed company executives. I carried out Skype and telephone interviews with business leaders and business executives of small-

scale agribusiness firms. Hershberger and Kavanaugh (2017) and Whale (2017) advocated the use of Skype interviews in case studies where participants are geographically dispersed and where cost efficiency is a consideration.

Researchers utilizing a case study design can source data from six sources: (a) interviews, (b) documentation, (c) archival records, (d) physical artifacts, (e) direct observation, or (f) participant-observation (Smith, 2018; Hershberger & Kavanaugh, 2017). It is recommended to use at least two sources for data gathering in a case study (Yin, 2018). I collected data through semistructured Skype interviews (see Appendix B), company documents, and company/archival documents.

I gathered and reviewed company documents covering internal records on BMI strategies. Such documents included company catalogs, business reports, financial reports, seed production and marketing data, and media accounts. I asked for contracts and company pamphlets that show the implementation of BMI strategies in each of these seed companies. I was given company brochures, pamphlets, and reports. Such information was useful in informing on the company background and the types of BMI strategies undertaken, reports and articles posted on websites, as well as newspaper articles. Yin (2018) advocated the use of archival data to serve as supporting evidence.

The use of semistructured interviews enables participants to provide additional details and explanations and allows me as a researcher to probe further where necessary (Gaikwad, 2017). Interview questions in qualitative research should (a) focus on one aspect and not be double-barreled, (b) be neutral and open ended, and (c) be clear and unambiguous such that the researcher should think about how the interviewee would interpret that question (Lewis, 2015; Rosenthal, 2016). Such varied data sources offer an

unparalleled combination of both objective and perceptual data offering both subjective or interpretive and more factual information. Such an integrative approach will enable me to generate a deeper understanding of organizational processes and outcomes not picked from other research methods and therefore offers data credibility (De Massis & Kotlar, 2014).

Such a triangulation method allows adoption of different angles to data collection and analysis of the same phenomenon from multiple dimensions enhancing credibility of the findings (De Massis & Kotlar, 2014). I equipped myself with the different methods of data collection through practice in my work as I applied my doctoral classes to my work with agribusiness companies in comparable geographical areas. The triangulation methods are only useful to the extent that a researcher is sufficiently knowledgeable and able to apply the data collection methods (De Massis & Kotlar, 2014).

I followed the interview protocol (see Appendix A) and adopted a systematic manner in asking the questions while probing to obtain elaborate responses. Castillo-Montoya (2016) advocated the use of an interview protocol to ensure that the interview questions align with the research questions and for the interview process to be an inquiry-based conversation. In following the interview protocol, I used the opportunity to reiterate the purpose of the study and to review the contents of the informed consent form with each participant. Following the interview protocol also afforded me the opportunity to reassure the participants of the confidentiality arrangements and answer any questions from participants as they arise. I sought permission to record the interview and to take some notes for accurate recording of the discussions. I adopted the five-step approach to

the interview process: (a) introduction, (b) warm-up, (c) main body, (d) cut-off, and (e) closure as recommended by Alsaawi (2014).

Reliability and validity are key criteria for evaluating the quality of research (Noble & Smith, 2015). I sought to obtain data consistency and accuracy as advocated by Fan, Lai, and Li (2015) and Saunder, Lewis, and Thornhill (2016). The strategies for enhancing reliability of the study lie in laying out the steps I followed in conducting the research, analyzing the data, and clearly presenting the data such that the reader can evaluate the processes followed in the case study. In this regard, I adhered to (a) the use of a case study protocol laying out all the key strategies and protocol (see Appendix A), (b) transparently using data preparation and presentation to make it clear and easy for the readers to follow, and (c) replication of the case findings by backing my findings through a database of the case study data collected in the research study as provided by De Massis and Kotlar (2014) and Drisko (2016).

I utilized member checking which entails sharing the emerging analyzed themes with the participants for them to confirm consistency and accuracy of the analysis as suggested by De Massis and Kotlar (2014) and Drisko (2016). Such member checking can achieve twin objectives of allowing key informants to clarify the accuracy of interpretation of the data and also provide additional perspectives rendering credibility of the qualitative results (Birt, Scott, Cavers, Campbell, & Walter, 2016; Morse, 2015).

### **Data Collection Technique**

The data collection process for this exploratory case study began with seeking the Walden University IRB approval, which once obtained marked the beginning of my field work. The research question for this qualitative multiple case study was: What strategies

do small-scale agribusiness seed company business leaders use to close the innovation gap in the smallholders' market? The principal data collection techniques were semistructured interviews and company documents. I contacted the participants explaining to them the purpose of the research and asked them to complete the informed consent forms to acknowledge their willingness to participate in the study (see Appendix B).

Once I had received the signed informed consent forms, I scheduled Skype and phone interviews with the participants on dates, times, and places mutually agreed with them. My role was to collect data that allowed me to answer the research question by understanding the data, interpreting it into themes and writing it up as recommended by Castillo-Montoya (2016) and De Massis and Kotlar (2014). I followed the interview protocol in all my semistructured Skype interviews (see Appendix C).

I audio recorded the interviews with a Philips DVT2710 voice recorder backed up by Audacity application on my computer and took brief notes to ensure that I captured the vital information. Data capture can be recorded for later transcription, and ideally one should have a recorder and a backup recorder as well (Rosenthal, 2016). I utilized two data recording methods per interview to safeguard against the pitfall of one interview recording mechanism failing. I closed the interview by thanking the participant for their valuable contributions as well as invite them to participate in a member checking interview at a later stage. After the interviews, I stopped the recorder and went over the interview recording to check the accuracy of my notes and recording quality.

Baskarasda (2014) and Hyett, Kenny, and Dickson-Swift (2014) recommended the use of more than one data source as an effective methodological triangulation in case

study research. I conducted semistructured Skype and telephone interviews to manage the geographical spread of the participants across a number of countries (see Appendix C). O’Cathain et al. (2014) recommended the use of telephone interviews for participants that span across a broad geographical area and for interviewing participants that are busy and find it challenging to commit too much time for interviews. In addition to interviews, I also collected relevant company documents such as operational documents, brochures and website information where relevant. The key information of interest was the financial performance, growth strategies and business profitability, an important aspect in methodological triangulation. Castillo-Montoya (2016) advocated the use of an interview protocol comprising a set of interview questions and the process to be followed in guiding the researcher in conducting the interviews. I was guided by the interview protocol (see Appendix A).

**Interviews.** Use of semistructured interviews in case study research offers advantages to researchers to understand by obtaining targeted information covering the research question with participants providing unique insights sharing perceived causal inferences (Gaikwad, 2017). Interviews also have the advantage of providing relevance to participants and enabling the collection of in-depth data with clarity (D’Souza, Singaraju, Halimi, & Mort, 2016). In addition, open-ended questions allow participants to share their lived experiences (Jamshed, 2014). Interviews can also have the downside of bias if the questions are poorly designed or asked. There can also be incomplete recollection by participants or the challenge of reflexivity where participants provide information that they think the research wants to hear (Gaikwad, 2017).



There may also be a misrepresentation of information of a historical nature deliberately or through memory loss of details or memory distortion (De Massis & Kotlar, 2014). Such bias can take the form of “hindsight bias, attributional bias and subconscious attempts to maintain self-esteem or impression management” (De Massis & Kotlar, 2014, p.19). Another limitation of the interview method is the poor selection of critical informants or the perceptual agreement problem where key informants in the same company do not agree on a given phenomenon (De Massis & Kotlar, 2014). Skype interviews can offer particular challenges such as functionality of webcams, audio and stability of internet connections (Whale, 2017). Skype interviews also offer advantages for geographical locations that are far apart and enables researchers to access participants that would otherwise be neglected (Whale, 2017). In the modern era, use of Skype for business is common practice and the challenge of comfort with Skype is overcome (Whale, 2017).

To maximize on the benefits of the semistructured interviews, I established good relationships with the BLs and BEs (seed company executives) from the chosen firms once they had given their informed consent. Video calls help me to build rapport with participants (Whale, 2017). To ensure transparency, I briefed each of the participants on the project and provided them with a project summary on the purpose of the research followed up by a telephone meeting with each of proposed interviewees. Once I secured participants’ informed consent, I proceeded to undertake at least one semistructured interview with each participant involved in the BMI strategy development and implementation. Each interview lasted on average one hour. These semistructured interviews followed a set of open-ended questions for each of the elements of the BMI

conceptual framework (see Appendix C). Rowley (2014) recommended the use of explicit and probative follow-up questions. I asked probing follow-up questions and recorded all interviews on an audio recorder and backed that up with my phone in case one of the two recording mechanisms failed. Protecting the confidentiality of participants is a prerequisite including the masking of names of participants and their businesses (Check, Wolf, Dame & Beskow, 2014).

The interview questions in qualitative research should (a) focus on one aspect and not be double-barreled, (b) be neutral and open-ended, and (c) be clear and unambiguous such that the researcher should think about how the interviewee would interpret that question (Rosenthal, 2016). I utilized an interview guide and literature on small-scale agribusiness seed companies' participants. Literature is a good starting point for identifying recommended BMI strategies for small-scale agribusiness seed companies. I shared information about participants rights, confidentiality, and general information about the study through email. The list of documents shared with the participants included the informed consent form, an information data sheet, and an abstract of the purpose of the study, interview process, and confidentiality procedures as recommended by Haahr et al. (2014) and O'Cathain et al. (2014). I made an appointment with each participant and assigned a research number to each participant as described earlier.

**Secondary information.** In addition to the interview method, I requested and obtained access to some company reports and project documentation, and any other previously published documents on the companies. Such documents included company catalogs and business reports, seed production and marketing data, and media accounts. I also asked for contracts and company pamphlets that show the implementation of BMI

strategies in some of these seed companies. Such information was useful in informing me on the company background and the types of BMI strategies undertaken.

**Company documents.** The value of secondary information is that it is “stable, unobtrusive and an exact source of data” (De Massis & Kotlar, 2014, p.21). Company documents are also unobtrusive as they are already available prior to the case study and cover a wide time span (Gaikwad, 2017). However, small companies are notorious for not documenting their work or poorly keeping their records which may affect retrievability of the data or business leaders may be tempted to selectively share documents (De Massis & Kotlar, 2014). Nevertheless, such records represent credible data that is not retrospective as it is recorded when the events happened and uses multiple sources such as different scholars, reporters and market and financial experts making it factual information (Anney, 2014; De Massis & Kotlar, 2014). Such data provides an unparalleled chronological dimension that span longer than a research project. Further, such data provides longitudinal evidence in time and space (De Massis & Kotlar, 2014).

**Member checking.** To enhance the credibility of a study, I conducted member checking after I had analysed the data. Member checking is when the researcher shares the interpretation of the data to participants to afford them the opportunity to confirm or refute the accuracy of the researcher’s interpretation and clarify any points that require further details (Anney, 2014; Harvey, 2015). I shared my interpretation of the data with the emerging themes and afforded participants 48 hours within which to respond with their acceptance or modification of the analysis. Birt et al. (2016) asserted that the sign off of the analysis by the participants is crucial for enhancing the reliability of the research. I emailed a copy of my draft interpretation of the data organized by the merging

themes to each participant for them to check the accuracy of my preliminary analysis. Participants were free to confirm the accuracy of my interpretation or provide any clarifications they deem necessary. Member checking is essential to enhance the study's credibility (Harvey, 2015; Morse, 2015). I received responses with most participants accepting my interpretation. In one case, the BL participant redacted some of the material originally shared with me because I was not going to ascribe the innovation to his company by name.

### **Data Organization Technique**

**Managing data.** The efficient organization of data is part good practice in qualitative research (Malsch & Salterio, 2015). To manage the multiple data sources, I created a case study database to enhance the reliability of my research to enable me to track and organise the data sources and notes from interviews, observations, key case study documents, tabular materials, narratives from key informant interviews, photographs and audio recordings. Creating such a tracking system makes data analysis easier and offers a replicable system that other researchers can use for similar studies. Keeping track of data gave me a line of sight when themes emerge, data categories, models and analytic memos. Utilizing a similar system, De Massis and Kotlar (2014) created a chronological ordering of events per case based on their interview transcripts, field and interview notes, secondary sources and picked up patterns across the different data sets. I used this approach to create a chain of evidence in this study to enable external observers to trace my footsteps from start to finish and enhance the credibility of the findings.

An important consideration is the secure storage of data and destroying data after analysis to protect the confidentiality of participants (Mealer & Jones, 2014). It is also important to observe the requirement to save electronic data for 5 years and keeping it in a lockable drawer in my home office. I only used the data for the purposes of the research and plan to destroy it at the end of the 5 years.

### **Data Analysis**

Data analysis in qualitative research is the relating of data to establish meaningful patterns as thematic answers to the research questions (De Massis & Kotlar, 2014). The data analysis steps need to be transparent and clearly laid out to inform the readers to understand the processes followed by the researcher (De Massis & Kotlar, 2014). In this regard, I analyzed my data systemically. De Massis and Kotlar (2014) posited that the data analysis process is iterative as a researcher analyses the data and seeks the emerging patterns in response to the research question while gathering data. The iterative nature of data collection and analysis means that I could modify the research design while managing the risks associated with data manipulation as recommended by De Massis and Kotlar (2014).

**Triangulation.** Triangulation is the application of more than one methodology to obtaining information and understanding of a given phenomenon through corroboration in qualitative research (Anney, 2014; Wilson, 2014). There are four principal types of triangulation: data, theoretical, investigator, and methodological (Anney, 2014; Cope, 2014). According to Anney (2014), methodological triangulation involves use of more than one research method to study a phenomenon therefore enhancing validity and

credibility of findings. Within the methodological triangulation are the *across-method* and *within-method* triangulation techniques (Anney, 2014).

The former utilizes a combination of a qualitative and quantitative data collection approach. The within-method approach uses two or more data collection procedures such as interviews and archival data (Tran, Porcher, Falissard, & Ravaud, 2016). I used “*within-method*” triangulation to maintain a qualitative research design focus. I collected data that covered different time periods narrated from participants’ perspectives by interviewing several participants and retrieving archival documents for validation purposes.

**Preparation for data analysis.** There are four key techniques for preparing data for analysis as outlined by De Massis and Kotlar (2014). These are (a) data reduction, (b) data display, (c) data categorization, and (d) data contextualization (De Massis & Kotlar, 2014; Rowley, 2014). Data reduction involves making sense of the collected data and condensing it and categorizing it for simplicity to enable its analysis with a view on what data is required to answer the research question. Data display involves compressing the data into presentable formats such as charts, images, and matrices to make it accessible and to make it easier to see the emerging themes. This is the stage where coding takes place, and passages of text are marked for similarities of messages and accompanying explanations are noted to connect data (De Massis & Kotlar, 2014). Data categorization is about decomposing the data to identify similarities and differences in the emerging themes. Data contextualization is about assembling the data to identify links and connections and contradictions (De Massis & Kotlar, 2014).

**Techniques for data analysis.** Data analysis can take the form of (a) explanation building within-case analysis, (b) cross-case analysis, and (c) pattern matching (De Massis & Kotlar, 2014). I have provided a clear and proper layout of the data analysis to provide a basis for readers to judge the credibility of the research in the section below. It was important to avoid the risk of data analysis and presentation in separate parts based on the data collection method as if the different data sources are answering different research questions. The whole point of multiple data sources is not to analyze and report that data separately but to integrate the data from different instruments and report it in an integrated manner as well (De Massis & Kotlar, 2014). Relevant data is considered reliable if at least two key informants report it from different firms or if it is also confirmed through secondary data sources such as company reports. I used the NVivo 12 qualitative data analysis software package to enable me to rigorously analyze a large data set particularly in systematically coding and arranging large volumes of data into categories.

**Transcription.** I hired the services of a professional transcription service provider to convert the audio files from open-ended interviews into written form and cross-checked the written format against the recordings to ensure that there was a match and to pick up any transcribing mistakes before analyzing the data. Rosenthal (2016) recommended that due to the large volumes of data, it is advisable to hire the services of professional transcribers to undertake the conversion of recordings into written form before undertaking data analysis (Rosenthal, 2016).

**Key Themes.** Data analysis can take the form of thick descriptions by laying out the research setting, context, and content of the interviewees for the reader to appreciate

the research environment (Rosenthal, 2016). In this regard, my process for data analysis involved reading the transcripts and re-reading them to (a) identifying recurring ideas, (b) coding the recurring ideas from identifying common points and writing notes in the margins of the text, (c) identifying themes that link various codes into meanings through an abstraction process as recommended by De Massis and Kotlar (2014) and Rosenthal (2016). Researchers use thematic analysis to provide an abstraction of rich details obtained in the data from participants into specific themes (Vaughn & Turner, 2015; Fugard & Potts, 2015). From this analytical process, I abstracted six themes. Too many themes are akin to replaying the interview guide in the research findings (Rosenthal, 2016). I was not necessarily guided by the number of themes but generated and refined themes until no new themes emerged as recommended by Fusch and Ness (2015). I checked the identified themes against the original transcripts and also shared the analysis with the interviewees as member checking for confirmation, clarification and or addition of insights. More importantly, I linked the themes to the conceptual framework and also related them to the latest BMI and agribusiness seed companies' literature published after my fieldwork. I matched the major themes with the shared experiences of the participants and undertook my data analysis through interpretation before conducting member checking as part of the interpretation verification process to build accuracy, credibility, and verification of the data collection process and data analysis as recommended by Fan et al. (2015).

### **Reliability and Validity**

Reliability and validity are crucial research quality elements often applied to quantitative research to gauge the trustworthiness of the research findings (Anney, 2014;



Noble & Smith, 2015). Within qualitative research, alternative criteria of dependability, credibility, confirmability, and transferability are used to establish the trustworthiness and rigor of qualitative research (Anney, 2014).

### **Reliability**

Reliability is the extent to which other researchers can come to the same research conclusions in similar research should they follow the same steps implemented in one research (De Massis & Kotlar, 2014). It is the equivalent of generalizability of findings in quantitative studies (Polit, 2014). Webster, Bowron, Matthew-Maich, and Patterson (2016) pointed out that reliability is assured when a researcher minimizes errors and biases through dependable and stable data collection and analysis procedures. I used an interview protocol and use the same data collection process and analysis procedures (see Appendix C).

### **Dependability**

Dependability relates to the extent to which other researchers can come to the same research conclusions in similar research should they follow the same steps I implement in my research (De Massis & Kotlar, 2014; Noble & Smith, 2015). It is a consistency or repeatability check over the same conditions (Cope, 2014) or “the stability of findings over time” (Anney, 2014, p.278).

Dependability is about the quality assurance of the research that sets the trustworthiness of the research (Yazan, 2015). Enhancing the dependability of my study was achieved through laying out the steps I followed in conducting the research, analyzing the data and clearly presenting the data such that the reader can evaluate the processes followed in the case study. In this regard, I established an audit trail by

adhering to the use of a case study interview protocol (see Appendix A) to ensure the reliability of data gathering. I hired a professional transcriber to transcribe each interview verbatim to ensure the accurate capturing of participants views and experiences as recommended by Cridland, Jones, Caputi, and Magee (2015). In addition, I kept raw data, interview and observation notes as well as any documents I collected from the field as suggested by Anney (2014). I also established a database of the case study data collected in the research study for backing my findings. I used member checking, which entailed sharing the emerging analyzed themes with the participants for them to confirm consistency and accuracy of the analysis as suggested by Harvey (2015), Hussein (2015), and Noble and Smith (2015). Such member checking achieved the twin objectives of allowing key informants the opportunity to clarify the accuracy of interpretations I rendered to the data and also provided additional perspectives where necessary as suggested by De Massis and Kotlar (2014) and Drisko (2016). I used established data preparation and presentation techniques to make it clear and easy for the readers to follow. Yazan (2015) suggested the use of NVivo software to enhance dependability as an unbiased mechanism for data manipulation using Saldana's (2016) thematic analysis approach.

### **Validity**

Validity is about how the conclusions drawn from the research are drawn from an accurate description of the research and is a measure of what the study intended to study (De Massis & Kotlar, 2014; Kihn & Ihantola, 2016). Validity is also about the appropriateness of the tools used, processes followed in data collection and analysis, and

the data itself (Leung, 2015). I used member checking and triangulation and established an audit trail as recommended by Noble and Smith (2015) and further explained below.

### **Credibility**

Credibility is about the truthfulness of the information generated from the research participants and how the researcher collects and interprets that information through engagement with the participants using different forms of data collection and maintaining the participants' original views (Anney, 2014; Gonzalez, Rowson, & Yoxall, 2015; Noble & Smith, 2015). I used methodological triangulation to collect data through semistructured interviews with different informants within each company and company documents to ensure cross examination the integrity of the participants' responses. I also used the member checking and methodological triangulation to enhance the credibility of my study. Member checking is important to ensure that my interpretation of data from multiple sources and multiple perspectives have convergence and confirmation of results from the participants (De Massis & Kotlar, 2014; Drisko, 2016). Member checking is at the heart of credibility as it ensures that ensures the voices of the participants in the data analysis and removes researcher bias (Anney, 2015; Caretta, 2016; Morse, 2015). Member checking also allows for structural corroboration and coherence by testing for "internal conflict or inconsistencies as well as referential adequacy" Anney (2014, p.277). Each participant was afforded a chance to review my draft interpretations of the data to ensure its accuracy and credibility and were free to challenge or refute my interpretations and clarify any points I may have missed as recommended by Day et al. (2018).

**Transferability**

Transferability is a quality measure that establishes the degree to which the findings from one study can be transferred to other contexts similar to the generalizability criteria in quantitative research (Anney, 2014; Elo et al., 2014). The key strategy for ensuring transferability lies in providing thick descriptions. In that regard, I provided enough data and on participants for the reader to assess the adequacy and transferability of the results. I sought to establish the causal links between the conceptual framework variables and case study research results. I also sought to establish a plausible link between the two aspects for the case study results to stand logical reason in the following manner. First, I demonstrated the causal link between the conceptual framework and the analyzed data and demonstrated that there are no spurious concepts that account for the explanation of the research results as recommended by De Massis and Kotlar (2014) and Drisko (2016). Second, I utilized pattern matching by comparing the research results to those patterns predicted in the conceptual framework or established in previous studies which also serves as confirmability of my study. Lastly, I used cross-case analysis to compare results from the multiple cases in line with guidelines from Bloomberg and Volpe (2015) and De Massis and Kotlar (2014).

**Confirmability**

Confirmability refers to the degree to which the results of one study can be confirmed or corroborated by other researchers (Anney, 2014). In other words, the extent to which the reported results are reflective of the data and interpretations of the findings and not the opinions of the researcher. The measures for ensuring confirmability lie in establishing an audit trail, reflexive journaling and triangulation (Anney, 2014; Kihn &

Ihantola, 2015; Williams, 2015). I enhanced confirmability by asking probing questions during the semistructured interviews and conducting follow up member checking interview. I asked probing questions to gauge the authenticity of the respondents' responses to the interview questions and obtain clarification where necessary. Follow up member checking interviews are useful to confirm the accuracy of the data and researcher interpretations while allowing the participants to retain their voices in the research (Cope, 2014; Saunder et al., 2016).

**Data saturation.** Data saturation is a function of the richness and thickness of data as opposed to the size of the sample (De Massis & Kotlar, 2014; Fusch & Ness, 2018). Saturation is a function of no new additional information being generated exemplified by the statement "heard it all" Malterud et al. (2015, p.7). My simultaneous data collection and analysis pursuit is aimed at obtaining richness and data thickness. Richness is considered regarding the quality of information obtained while thickness is considered concerning the quantity of the information and obtaining both is the best option.

### **Transition and Summary**

In Section 2 of this proposal, I covered information on my role as the researcher, participants, research method and design, population and sampling, ethical research, data collection techniques, data management techniques, data analysis, and research reliability and validity. I also provided rationalizations for the choice the qualitative explanatory multiple case study design, purposive sampling, and semistructured open-ended interview questions. In Section 3, I provided the research findings, application of research findings

to professional practice, the implication of those findings to social change, recommendations for action and future research, as well as reflections, and a conclusion.

### Section 3: Application to Professional Practice and Implications for Change

#### **Introduction**

My purpose in this qualitative multiple case study was to explore strategies that small-scale agribusiness seed company leaders use to close innovation gaps in smallholders' markets. The population for this study was agribusiness seed company chief executives and operations managers of small-scale agribusiness seed companies in Zimbabwe, Zambia, and Malawi, in southern Africa, whose primary markets are smallholder farmers. Market penetration by agribusiness seed companies in the smallholders' market remains at a disappointing 10% to 20% in SSA (Gaffney et al., 2016; McGuire & Sperling, 2016). This study could have significant contributions in exploring innovation strategies used by agribusiness seed company leaders to close the innovation gap in the smallholders' market. The overarching research question was: What strategies do small agribusiness seed company leaders use to close innovation gaps in smallholders' markets?

I conducted semistructured interviews with five small agribusiness BLs and five BEs in three countries in nine agribusiness SCs and used methodological triangulation of my data sources using a combination of interview data and company documents. Using NVivo 12 for data analysis and based on the BMI conceptual framework and literature review, six main themes emerged: (a) company BM, (b) seed production model, (c) product and market differentiation, (d) value chain partnerships, (e) performance measurement, and (f) organisation for innovation. The themes are based on participant views, experiences and responses to the interview questions on how they close innovation gaps in smallholders' markets.

### **Presentation of the Findings**

The overarching research question in my study was: What strategies do small agribusiness seed company leaders use to close innovation gaps in smallholders' markets? The specific business problem that I addressed in this study is that some small agribusiness seed company leaders lack strategies to close innovation gaps in smallholders' markets. For the research method and design, I used a multiple exploratory case study to gain insights to my research question as described by De Massis and Kotlar (2014). My data were sourced from 10 interviews with BLs and BEs from nine SCs spread across three countries in southern Africa and triangulating that data with company documents. I transcribed the audiorecorded data into written text before analyzing it in NVivo 12 through open coding, axial coding, categorization, and thematic analysis. I stopped analyzing the data when no new information and codes emerged from the data analysis as recommended by Fusch and Ness (2015). For confidentiality, I identified all participants with codes as BL 1, BL 2, BL 3...BL 5, or BE 1, BE 2, BE 3 and BE 5. To mitigate personal bias in the study, I used an interview protocol and member checking as recommended by De Massis and Kotlar (2014) and Drisko (2016). I also used methodological triangulation by using interview data along with company documents as suggested by De Massis and Kotlar.

From the data analysis, six themes emerged on the strategies used by small agribusiness seed company BLs and BEs to close the innovation gaps in smallholders' markets. The six themes were (a) company BM, (b) seed production model, (c) product and market differentiation, (d) value chain partnerships, (e) performance measurement, and (f) organisation for innovation. The themes can benefit small agribusiness BLs and



BEs in the study by focusing their attention on how to improve their strategies in closing innovation gaps and enhancing their market share growth in the smallholders' markets.

According to the BMI theory, business leaders operating in fast-changing environments require agility to identify and develop innovations to emerging market opportunities to disrupt markets and build resilience to external threats (Battistella, De Toni, De Zan, & Pessot, 2017). Maintaining company value propositions relevance for continued value extraction requires building of capabilities to avoid capability myopia (Battistella et al., 2017). A BM is a depiction of how a company "creates, delivers, and captures value- economic, social, or other" (Battistella et al., 2017, p. 67). Maintaining business relevance requires BMI or reconfiguration. Such BMI can be triggered by the need to match industry trends or a response to new opportunities or fulfilling unmet market needs. The study was carried out in the context of barriers to BMI by leading incumbent firms due to two main factors. The first is that the underlying BMs (assets and processes) create a lock-in effect too expensive to modify from the existing BM to a new one limiting incumbent company executives to the present BMs (Battistella et al., 2017). The second is a cognitive barrier where the dominant company BM is itself a barrier which forces management to develop capability myopia to develop new innovations as has been the case in large agribusiness seed companies failing to penetrate the smallholders' market (Christensen et al., 2016).

It was in this context that I sought to understand how business leaders of small agribusiness firms develop and execute strategies to close innovation gaps as disruptors in the smallholders' markets. Battistella et al. (2017) identified core capabilities required by business leaders faced with fast changing market environments as (a) strategic ability,

(b) strategy innovation capability, (c) resource capitalization capabilities, and (d) networking capabilities. I will relate my research findings to some of these capabilities.

### **Theme 1: Company BM**

A company BM reflects how an organisation creates and captures value, its underlying logic. To achieve sustainability, company executives require cooperation with different stakeholders beyond the boundaries of the firm and navigate value transfers with up and downstream actors (Brehmer et al., 2018). Small seed company executives must navigate these value boundaries as they mostly rely on upstream and downstream value chain partners to create and deliver value. From the study, successful BM design in small-scale agribusiness company executives focused on the design of their company BMs to suit their operating environments working with up and downstream actors.

Brehmer et al. (2018) posited that there are five types of BMs company executives can adopt. The BMs are make-sell, resell, license, symmetric multisided, and asymmetric multisided. The make-sell BM is where the company executives design the value content and manufacture the products inhouse or outsources the production and then undertake the selling. The second is the resell BM where the value content is sourced elsewhere and not produced inhouse and then sold to customers. The third is the license BM where the company executives license others assigning them rights to produce or resell the value content. McDonalds is that type of model. The fourth is the symmetric, multisided BM. It has two dimensions with one value content production and delivery element for paying customers generating value for the other customers, who may or may not necessarily have to pay extra for it. An example is an estate agent platform that enables real estate owners to advertise and find customers while also enabling

potential property seekers to find suitable properties. The two customer segments therefore benefit from the estate agent platform. The last is the asymmetric multisided BM. An example is a newspaper charging one customer for advertising in a newspaper. The advertising customer pays for that service while the customer who buys the newspaper does not have to pay an extra price beyond what they would have paid for the newspaper just because there is an extra advertisement in the newspaper.

One key finding from the study was that small-scale seed company executives embraced BMI and customized their BMs to suit their operating environments to close the innovation gap in the smallholders' market. Table 1 shows the types of BMs used by small-scale seed company executives in the nine cases studied. In my case analysis using Brehmer's et al. (2018) BM classification, the cases exhibited four different types of BMs. There was a difference from Bremmer's BM typology in the fact that I found more than one BM type in individual business cases, meaning that a single business had more than one BM.

Table 1

*Number of Seed Company Business Model Patterns by Country*

Country	Total cases	Make-Sell	Resell	License	Symmetric multisided	Asymmetric multisided
Country A	3	1	2	0	0	0
Country B	3	1	1	0	3	2
Country C	3	1	2	0	0	0
Total	9	3	5	0	3	2

**Make-Sell.** There was a total of three SC cases that were involved in producing their own seed and selling it. They had their own farms where they undertook seed production. The seed company executives all outsourced seed production to smallholder

farmers, and in turn received the seed for processing to resale to smallholder farmer customers.

**Resell.** There were five firms that predominantly outsourced all their seed production to smallholders. The smallholder farmers were carefully selected to undertake seed production and the seed companies then processed the seed for packaging and resale under their label. This was the most common seed production model with all seed companies undertaking some form of seed production under this BM. One of the key features of the resell model was that smallholder farmers producing the seed were also customers of the seed. The seed companies then processed the seed very close to the sources of production in rural areas and resold the seed into those market segments with short transport routes for fair seed prices as noted by Brehmer et al. (2018) in short cycle product lines.

The use of smallholders as seed growers achieved two objectives for the small seed company executives. First, the smallholders are the seed users and their participation in seed production has the seed company executives working with the same seed customers as marketers of the seed. Second, the technology adoption barrier is immediately overcome as other smallholder farmers see their peers growing the seed in their locality and technology diffusion is immediately enhanced in line with Mannan's et al. (2017) DOI model. The DOI model has five attributes that enable increased adoption of products and services by intended users. Mannan et al. (2017) articulated the five DOI dimensions as (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability or the opportunity for the target customers to try the product or service, and (e) observability. Working with smallholders to produce and use the seed as customers

enhances the compatibility, triability, and observability dimensions for new smallholder seed customers therefore enhancing technology adoption.

**Symmetric Multisided.** There were three such company BMs that were premised on the seed company BM acting as a platform linking smallholders seed customers with buyers/processors of their final grain. These models were crop specific with a focus on groundnuts, beans, and soya beans. The seed company executives, therefore, grew their business interests by deepening smallholder customer base while linking the smallholder farmers to buyers of the crops grown by the smallholders. This BM typology was in line with Brehmer's et al. (2018) symmetric multisided BM model.

**Asymmetric Multisided.** Two seed companies were operating under asymmetric multi-sided BMs in that they produced seed and processed the grain produced by the farmers under that model. In return, the business executives ploughed back the income returns to undertake social investment activities to uplift smallholder farmers. The key features of these two BMs were that customers of seed generated revenues and produce (grain) used to produce finished products by the agribusiness seed companies. For example, one of the seed companies bought groundnuts from smallholder farmers to produce peanut butter. The company executives made a profit part of which they redeployed to deliver social impact services to other disadvantaged farmers in furtherance of innovation adoption while also growing their BM profitability as posited by Brehmer et al. (2018).

**Legal forms of seed companies.** There can be for profit, nonprofit, as well as hybrid BMs companies. Out of the nine business cases analyzed in this study, seven were applying the for-profit BM, whereas two were applying the hybrid BM. For the for-profit

companies, the main goal is to make income gains for the owners of the enterprise from the manufacturing and selling of the products and services. Profits are distributed to the owners, employees, and shareholders in such a business. In the nonprofit company, there are no shareholders and a board runs the organization to deliver societal influence. All profits are reinvested to amplify the social impact as posited by Brehmer et al. (2018). In the hybrid company, there is a combination of for-profit and nonprofit objectives in the same organization.

**Participant demographics.** The participants in the study comprised five BLs and five BEs from nine small-scale agribusiness seed companies located in three countries in southern Africa. Three of the five BLs participants were female, whereas all Bes were males.

Table 2

*Agribusiness Seed Company Study Participants Demographics*

Seed company	Key informant	Title in company	Gender
1	BE	Marketing & Operations Manager	Male
2	BL	Managing Director	Female
3	BL & BE	Managing Director & Operations Manager	Male
4	BE	Operations Manager	Male
5	BL	Managing Director	Female
6	BL	Managing Director	Female
8	BE	Agribusiness Manager	Male
9	BL	Managing Director	Male

**BM and societal sustainability.** Organizations are looked upon to come up with innovations that address societal challenges head on with attendant considerations to financial sustainability (profit), social sustainability (people), and environmental/ecological sustainability (planet). Invariably, achieving all these

sustainability dimensions requires a focus beyond products and services to focus on the BM (Brehmer et al., 2018). Sustainability focused organizations have to focus on value exchanges between the “focal organisation and its external network of BM actors and customers” (Brehmer et al. 2018, p. 1515).

**Contributions of BMs.** First, companies deliver financial sustainability through employing or supporting underprivileged communities through value transfers. Second, BMs can create an organizational imbalance as one part of the organization has to give to the other one which supports underprivileged groups through donations to underprivileged people who cannot afford the goods and services or through fair trade practices by paying *fair prices throughout the supply chain*. Third, the seed company executives can also apply the same traditional value logics of make-sell, resell, license platforms as suggested by Brehmer et al. (2018). There is a distinct group of for-profit companies that also combine non-profit dimensions.

The seed company executives I interviewed were triggered to establish small seed companies that innovated their BMs to address societal challenges while simultaneously delivering profit and social impact. For example, the seed company executive in SC 9 stated:

And we realized when we were getting the input that there really weren't quality seeds available. But at that point, we already had our model locked in. And then at harvest, we had a lot of people coming to us and saying, “Can we get your cowpea to plant? We can't find good seed anymore.” Eventually, we went to the government and classified our commodity cowpea as emergency seeds, started to understand the seed system here better, started to understand the market

opportunity better. In the next year, we came back as a fully formed legume seed company.

A BL in SC 2 stated the innovation gap in smallholders' market as a motivation factor for the formation of their seed company. The BL saw the innovation gap as a market opportunity to set up their seed company:

The second motivation was the issue of lack of availability of seed which created an automatic market for the seed for the farmers. Every now and then the people would complain that they cannot access seed. That was the second motivation. It was clear there was a market for seed. And the second thing is that the market was looking for specific products like soya bean which had high oil content and then when you go to the market you find all the mixtures and we could not really trade at a price that the good grade was trading for. So that also gave me that push to say if you proceed and work on these issues across the value-chain, then you have an automatic market in the chain which is the market.

A BL in SC 3 stated their motivation for establishing a seed company. The trigger was research evidence conducted by the company leadership:

The main thrust that made us focus on smallholder farmers was to do with the studies that showed there is little access or less access to seed varieties of choice by smallholder farmers. So initially we thought we would actually ask bigger seed houses to come in and actually converse with all the farmers who produce seed, but that proved to be a challenge. As we scan the country, everything is now made up into 90% smallholder farmers.



A BL in SC 7 used their experience working with smallholder farmers to close the innovation gap in smallholders' market. The BL used their career background and experience working with smallholder farmers as a trigger for forming a seed company and stated:

I worked in the Ministry of Agriculture as an agriculture extension officer, especially for women involvement in agricultural development programs. So, I worked for another 10 years and retired from there. That's the time I got very much involved with working with smallholder farmers as an extension worker. So, through that experience working with them, I got to understand their bottlenecks as farmers, how they had problems accessing markets for their grain produce, how the extension service delivery system was so weak on the ground. We see maybe so many smallholder farmers being ripped off by a system which brought inefficiencies in effectively reaching down to the smallholder farmers. And so, I developed an interest on how can I be part of assisting these smallholder farmers. Maybe to develop a market for them. To work with part as seed growers and then the other part as grain growers, so that they can be linked to other commodity off-takers. I started to do it as a seed grower. I then registered my company as a seed company.

Similar views were expressed by other BLs being triggered to design their BMs specifically to close the innovation gap in the smallholder markets. It was therefore no surprise that all the seed executives focused their BMs on the smallholders' market as their primary market of focus.

## **Theme 2: Organization for Business Innovation**

Small-scale agribusiness leaders, who have sustained their businesses for longer than 5 years, have deliberate organisational systems for closing innovation gaps in the smallholders' markets. The BLs also undertake annual strategic planning involving their staff and value chain partners. The business leaders also undertake periodic strategy implementation monitoring and use innovation metrics to monitor their business performance. A BE in SC I stated it as follows:

We hold a strategy meeting annually with all the branch managers, and distributors just before the start of the peak agricultural season of which our peak season, normally starts in September. So, in August, we do hold strategic meetings with all the key staff like the branch managers, other stakeholders, where we would put all our thoughts together. And we've got financial reports. Then we put forecasting for the next year so that each person can be given a target to achieve because, the branches, we give them targets and the production team can be given targets and the marketing team can be given targets. Then those targets can be agreed by everyone that they can be achieved, also taking into consideration the gross profit, which we need to maintain.

A BL in SC 9 also indicated how their operational and strategic meetings as a team enable the team to remain focused on their strategic innovations and delivery of profitable outcomes along with social impact. The BL in SC 9 outlined the meetings as follows:

We do have quite a few meetings and quite a lot of team time together. So we have Monday morning meetings, which are all-hands on Monday morning, of

course. Those are just kind of check-ins, see priorities for the week. We have operations meetings, which are managers and directors on tracking critical numbers, every Friday. So those are our two weekly meetings and we found that investing more time in having everybody informed about what's going on across the company is a really critical step to getting fresh ideas. And then a lot of the actual strategy work comes from the director level. We have six directors in the company including the two co-founders - myself and my co-founder. So, among those six people, we have a number of processes that we've developed over the years to kind of stimulate innovative thinking and to get people outside the box. That's also where a lot of operational work is done. So it's strategy and a lot of operational work like the budget creation and all of that. That's done at the director level. And every director that's full time is becoming a shareholder in the company. So we're starting to deploy our stock pool, our common stock pool. We haven't gotten there yet for legal reasons, but we have agreements with each of the full-time directors.

A BM is important as it shows “how strategy is concretely implemented and describes the rationale of how an organisation creates, delivers, captures value-economic, social, or other” (Battistella et al., 2017, p.66). In that regard, the BM also shows the customer value proposition, profit formula, key resources and key processes. Looking at the key drivers of BM success, it is clear that small agribusiness seed company executives are maximizing their market conditions of underserved smallholder farmers in line with established BM literature. The key drivers of BM success are considered to be market conditions, strategic synergies, competencies and assets, pricing

policies and revenue sharing schemes with smallholder seed growers, and effective organisational design and governance mechanisms (Battistella et al.).

BMI is concerned with the maintaining the competitiveness of a business through innovation or reconfiguration (Battistella et al., 2017). The drivers for BMI can be due to the need to respond to industry changes or to take advantage of new opportunities or satisfy customer need or challenges. In the case of the seed companies, the seed company executives were all triggered to change their company BMs to respond to the customers' challenges who found the offer from large seed companies inappropriate to them. This innovation is in line with Battistella's et al. assertion that new innovations come from new firms responding to customers finding existing solutions too expensive or complicated to access. The question that arises is why the incumbent established firms did not undertake these innovations themselves to fend off new entrants.

**Planning to Disrupt Seed Industry.** Battistella et al. (2017) argued that there are barriers for incumbent firms undertaking BMI. First, is the fact that the underlying configuration of assets and processes are in themselves a hindrance to responding to new opportunities and attempting BMI will impose high costs and risks to the incumbent firm. For example, large seed companies are set up to produce seed with large-scale farmers normally located close to their processing facilities in high rainfall regions. These seed production models are far from the smallholders' market and a shift from this production model to one that responds to the smallholders' market segments would require a reconfiguration of these large-scale seed companies organisational systems and acquisition of new capabilities which come at a significant cost and risk.

Second, is the cognitive barrier where the dominant logics of a company BM are themselves a barrier to looking at the market from new lens different from those imposed by the firm's dominant logic (Battistella et al., 2017). In a study of 26 cases of successful and failed company innovations, Christensen et al. (2016) concluded that as a company BM succeeds, it becomes more "interdependent and less capable of change" (p.33) driven by the business ingraining a way of doing business into its company culture. For instance, at the start of a company BM, the focus is on value creation where the BLs discover an unmet customer need for which they develop product and service offers.

Once that is done, in the second phase, seed company executives seek to sustain the innovation and the performance metrics are centered on building customers into a reliable base and building the organization with a focus on the income statement's topline and maximizing the bottom line (Christensen et al., 2016). The third phase involves a pursuit of efficiency where the seed company executives seek to sustain the innovation at least costs. Organisational systems are therefore created in a manner that takes away the space for managerial freedom and the focus shifts to shareholders and the 'race to the bottom' in terms of costs and less on the innovation and the customers. The shift to the value extraction elements means that there is less focus on the value proposition, and that vacuum opens the door to new entrants. The incumbent firms therefore create rigidity in their BMs and the business culture narrative shifts to cost and efficiency to maximize value extraction at the expense of new innovations (Christensen et al., 2016).

Successful seed company executives in small-scale agribusiness seed companies also undertake joint planning and maximize on the respective capabilities of their team members. The BL of SC 2 laid out their planning mechanisms they deploy:

Within the directors we have different expertise with my sister being an expert in marketing, and that's her area of expertise. I am more on seed production and the technical seed and all that and, of course, the social component which is mobilization of the farmers. I communicate with the other directors the key strategy behind what needs to be done. So often, as directors we meet and then we put our thinking on the table. Once we take that strategy thinking, then we simply package and then get our technical people to run with whatever strategy that we've come up with. But really, each and every director provides input into the strategy we have on the table so that we implement it accordingly.

Yet another BE in SC 3 stated how they undertake their planning and pointed out how all staff and board members are involved in the strategy setting meetings. In addition to staff members, the business leaders also invite specialist consultants in different areas to provide inputs to the organization's strategy formulation. The BE related the nature of planning they undertake in their company:

What we do is each year, we go for what I would say our yearly review and strategic planning meeting. So there, we try to reflect on the strategies that we would have used and how we would have fared in the previous year, then try to also shape our coming season. Like, for now, as we're getting into the 2018/19 agricultural season, we have got our strategy planning meeting in the first week of November. It's only that we have been overwhelmed by this Presidential Inputs Scheme that we have been busy with. We are supposed to have done that workshop like in October. So, there we sit, reflect, and also, we plan forward. In fact, it's all staff members from management to the garden boy. All staff

members, we have an opportunity to sit down and strategize. Yes. Then also we invite some consultants in different areas that we want assistance. It could be marketing. It could be financial. Then we sit down with the consultants and then we see how we move on the strategy.

**Capabilities.** BLs are faced with pressures to innovate or reconfigure their BMs because of (a) changing customer needs, (b) overcoming inertia in their organisations, (c) acknowledgement that there are shifts in the industry that are unavoidable and necessitate change (Battistella et al., 2017). Four capabilities are required to undertake such BMI interventions.

Successful small-scale seed company executives innovated around their relationships with a number of value chain partners in a very deliberate way that moved from transactional relationships to relationship-based collaboration with inherent co-creation responsibilities. The shift from a goods dominant business logic to a service dominant logic is a challenge for most BLs as the latter entails a shift to a value co-creation system between the service provider and its customers (Sjodin, Parida, & Wincent, 2016). Important in such a relationship is the need to reduce role ambiguities to maximize on product-service co-creation. Successful small-scale seed company executives have been effective in clarifying roles between themselves and their value chain partners in particular the smallholder farmer seed growers as well as setting expectations and responsibilities in the value co-creation process. The two (seed company BEs and smallholder farmers) parties have entered into what Sjodin et al. (2016) called a *co-implementation arrangement between the supplier and its customers* by changing their

relationship from being “transaction- based to a relationship- based collaboration” (Sjodin, et al., 2016, p.109).

**Strategic Agility.** This capability is defined as the “ability to dynamically revise or reinvent the company and its strategy” Battistella et al. (2017, p.67). This capability requires business leaders to anticipate and adjust their BMs to meet changing customers’ needs while remaining true to their company vision. Business leaders that have built in this capability are notable through five characteristics of (a) clarity of organisational purpose, (b) an organisational climate that promotes dialogue, (c) a small unit of accountability where decision making units are kept small, (d) staying in touch with the customers through an *outside-in* approach, and (e) a collective will amongst the organisational members (Battistella et al.). Successful seed company executives demonstrated this strategic agility capability.

**Strategy Innovation Capability.** This group of capabilities is about how business leaders maintain *adaptive, absorptive, and innovation* capabilities. Business leaders are here required to overcome perception limitations and continuously read the environment. Battistella et al. (2017) group these capabilities into two categories. The first category is about three capabilities. First is how business leaders capitalize on emerging market opportunities through adaptation. Second is how business leaders can tolerate and encourage risky ideas. Third is reconfiguration where business leaders are adept at changing their asset structure to respond to the changing environments.

The second category comprises two capabilities of acuity and seizing and sensing opportunities (Battistella et al., 2017). In acuity, business leaders have a good read of the business environment and build competences to respond to the changes in the market



environment. In seizing and sensing opportunities, business leaders are in a constant search for the next set of opportunities and the technologies they can deploy to capitalize on the identified opportunities. Small-scale seed company executives that successfully closed innovation gaps in smallholder markets also apply periodic meetings and risk management strategies to maintain acuity and sense opportunities. Seed company executives in companies SC 1, SC 2, SC 3, SC 5, SC 6, SC 7, and SC 9 indicated how they periodically meet to review their strategies and to manage risks. The BE of SC 1 outlined their planning frameworks as follows:

In between, we do regular meetings. For example, there's the executive meeting, of which I am part. It's comprised of division managers. We do weekly reports, weekly meetings where we'll be trying to make sure that our performance trackers are followed as per plan. Then we do monthly meetings with branch managers, to provide feedback, and also see whether we are still in line with our strategic objectives. Then the other meeting which we do bi-monthly is the risk meeting to see whether the business is having any risk factors. So, those are the major meetings which can be conducted to ensure that the business is on track with the things which are organized for.

A BE in SC 4 stated how their planning works. The BE outlined the different meetings they hold as follows:

We've got fortnightly meetings, where the different departments will report back on progress through the season, and then we note problems and then we offer solutions. That's how we proceed and re-strategize if things are not working.

A BL in SC 7 reflected on how they use field monitoring as a platform to inform innovation. The BEs use field observations and lessons learnt to inform the company innovation planning process.

Of course, for each year, it is like when our staff are going out to the field every quarter, when they are monitoring and so forth, that's the time to also learn lessons. So we have just bundled so that the trip to the field is not just for one aspect, whether it is a monitoring or a production manager. If I note something there in the field, I have to feed that to the rest of the management team. When everybody goes to the field, they're also collecting lessons learnt. New lessons learnt. So during the monthly management meetings and operations meetings, we bring those lessons there. We have a portion there for sharing those ideas. We are using research to inform practice, and are actually doing our own research and feeding into our operations.

**Resource Capitalization Capabilities.** This group of capabilities concerns how business leaders acquire, develop, and deploy their resources to capitalize on market opportunities. Such capabilities involve teamwork which converts team member knowledge and assets into strategic assets. Organisational culture is also considered a resource capability where the company mission, vision and core values are clear and internalized by team members to create a *shared mindset and strategic utility* (Battistella et al., 2017). It is evident that successful BLs and BEs of small-scale agribusiness seed companies are applying resource capitalization capabilities in their business innovations as evidenced in their reflections in the sections above.

### **Theme 3: Seed Production and Service Innovation Model**

Small-scale agribusiness leaders that have sustained their companies beyond 5 years servicing smallholder farmers have specific seed production and service innovation models. The low-income status context of the customers targeted by the small-scale agribusiness executives is a key driver to the innovations introduced in their BMs. Geissdoerfer et al. (2018) posited that extreme poverty and societal inequality necessitate a “transition to a more sustainable socio-economic system” (2018, p.165). BMI is an important mechanism for driving that change to meet sustainability objectives because technological innovation alone does not go far enough and yields diminishing returns. While the BM has become an important tool for systemic analysis and communicating how a business is configured as an organisational system, it is also as important for how it modifies existing company architectures to deliver products and service innovations (Geissdoerfer et al.). Successful seed company executives focusing on the smallholders’ market respond to such a challenge. The reasons for the formation of these small-scale seed companies demonstrate the innovation response to the poverty challenge through a combination of BMI, social product and service innovations.

**Seed Companies Seed Production Outsourcing.** Successful seed company BLs and BEs outsource seed production to smallholder farmers without signing any legal agreements. Rather they meet with the farmers and verbally agree the terms and conditions and trust each other based on their relationship. The seed company BLs and BEs provide the smallholder seed growers with expensive foundation seed and other inputs like fertilizers and chemicals on the strength that they will produce seed to the required standards and sell it back to the seed companies. The smallholder seed growers

also trust the seed companies that they will offer them technical agronomy support to enable them to grow the best possible seed and eventually buy the seed from them at pre-agreed prices. These business outsourcing arrangements are steeped in social relationships with the key performance monitoring system resting on the smallholder seed growers' group self-enforcement mechanisms of self-regulation (Lee et al., 2018). In addition, the seed companies BLs and BEs go and monitor the progress of the smallholder farmers seed growers and reinforce the group self-enforcement mechanisms. Should the seed produced by the smallholder seed growers not perform well, it is quality tested and traced back to each individual farmer. The smallholder seed growers' group has the right to kick out the concerned farmer/s from their seed growers' group. Should there be wholesale underperformance in the quality of the seed produced by the whole group, the whole group runs the risk of being kicked out of the seed growing relationship with the seed company with significant negative income and social status consequences.

**Smallholder Customers as Seed Growers.** All the seed BLs and BEs worked with smallholder farmers as their seed outgrowers. Such a supplier development mechanism is supported by Lee et al. (2018) as a key competitiveness factor. The importance of outsourcing has given rise to development of tools for managing buyer supplier relationships to enhance firm competitiveness. Amongst the advantages offered from outsourcing arrangements are cost reduction, access to specialized resources, quality improvements, focus on core competencies (Lee et al.). There are, however, risks to outsourcing as well. Key risks are "increased transaction costs, loss of innovation capabilities, opportunistic behaviors by suppliers, and undesirable outsourcing performance" (Lee et al., 2018, p288). Harnessing relationships within outsourcing

arrangements enhances competencies and leverages cooperation and resource recombination. All the participant BLs and BEs work with smallholder farmers as seed growers.

The salient seed production model features reported by the participants included farmers' recruitment, capacity building, monitoring and payment mechanisms. The BE in SC 1 outlined their seed production model as follows:

To recruit the farmer groups we just put some kind of informal advert saying we are looking for farmers that can do seed production. Then the farmers apply and we do due diligence visits to them to see their land and also assess their past performance. And we assess also the capacity in terms of past performance so that we can actually see what these farmers can do.

A BL under SC 3 indicated how the prospective smallholder seed growers actually find the seed company executives to sell their value proposition as potential seed growers. The smallholders therefore sell their value proposition to the seed company as explained by the BL:

In terms of how we identify the farmers, ever since we started, we really don't make that much effort, they find us. I don't know how but somewhere somehow, but they do get information. They get the information. Either they mention to their friends that we are seeking to grow seed and oftentimes somebody will approach us, and then once they approach us, we go, and we meet the farmers and then we do sensitization. We tell them who we are as a company, and what we do, and how we want to partner with them. So, from the word go, we are purely a business entity, and when we look at the farmers, we tell them. So, they find us,

and we agree on how to work together. We look at the regions and identify the right seed for the areas, because different seed varieties work for different areas.

**Supplier Development.** It can be defined as activities undertaken by the supplier to “upgrade and enhance their suppliers’ technology, quality, delivery, and price competitiveness in the outsourcing relationship” (Lee et al., 2018, p.290). The outsourcing company therefore undertakes supplier evaluation, performance expectation uplift, recognition and compensation, *commitment to future benefits, training and education of supplier personnel, direct investment in a supplier*. The benefits of supplier development rest in delivery compliance and cost savings. There are three dimensions to supplier management of (a) supplier selection, (b) supplier development, and (c) strategic supplier alliance (Lee et al.).

Supply chain management is considered a source of competitive advantage and can take the form of direct or indirect supplier development dimensions (Golmohammadi et al., 2018). The enhancement of supplier performance and efficiency leads to product quality improvements, lower supply chain costs and enhanced profitability for all supply chain members. Measures that buyers can adopt can include “enforced competition, informal assessment, and knowledge transfer to enhance supplier performance” Golmohammadi et al. (2018, p.1). Direct supplier development involves a buyer’s allocation of capital, human resources, and equipment to its suppliers. Indirect supplier development activities on the other hand involve no buyer allocation of resources or limited resources for supplier development. For instance, BMW and Hyundai deploy their engineers to their suppliers to improve their productivity as a direct supplier development intervention (Golmohammadi et al., 2018).

**Seed Companies Supplier Selection.** Successful seed company BLs and BEs undertook all three phases of supplier selection as articulated by Golmohammadi et al. (2018). There was a high level of supplier self-selection amongst the smallholder seed growers resulting in them reaching out to the seed companies to be recruited as seed growers. Supplier development was a common element with varying degrees of supplier development investment by the different companies. Strategic supplier alliance was seen in joint marketing and seed technology promotional activities between the seed companies and the seed growers through field days and seed fairs to enhance technology amongst many smallholder farmers.

**Long Term Relationship Orientation.** One of the glues to the seed companies BLs and BEs and smallholder farmers seed growers' relationship is the long-term orientation where both parties consider not just the present cooperative relationship but also future relationships as suggested by Lee et al. (2018). For instance, the smallholder seed growers pride themselves as innovators in their communities and when new seed technologies are introduced on the market, they get to try them first. The continued anticipation by smallholders in seed growing outsourcing relationships is both a financial uplift as well as a relational dividend for the smallholder farmers. On the other hand, the seed companies investment in seed growers pays dividends in both the short term and long term as the seed growers get more proficient at seed production and can increase their yields from improved training and resultant performance enhancements. It is therefore in the seed company BLs and BEs' interest to maintain the outsourcing relationship with the same smallholder farmers because when seed growers exit after a sustained period of supplier development by the seed company, the training and

development costs are sunk and not recoverable (Lee et al.). Trust is therefore important between the seed companies BLs and BEs and seed growers to “improve organisational performance, reduce negotiation costs and monitoring costs, and lead to mutually beneficial agreement” (Lee et al., 2018, p.291).

**Supplier Switching Costs.** While these direct supplier development activities may impose costs to the buyer, the resulting supplier capacity enhancements can be significant. There can be the risk of different competing buyers working with the same suppliers whose supplier development efforts may spillover (Golmohammadi et al., 2018). Seed company BLs and BEs assess and require their seed growers to have exclusive arrangements with them and not grow seed for another company at the same time as they are in contract with one particular seed company to avoid a free rider problem.

**Contracting Systems.** It is interesting to note that there are no written contracts between most seed companies and seed growers. Most of the smallholder seed growers have basic literacy and numeracy. The outsourcing relationships exist purely on relational basis. Lee et al. (2018) argued that a contract can be a source of distrust while relational governance mechanisms enhance trust and partner self-enforcement to act normatively and interfirm interdependence (Lee et al.). This practice was reinforced by the seed company executives that seed growers and seed companies work on trust relationships steeped in relational governance principles to good effect.

**Supplier Attracting Buyer.** There are also instances where suppliers take the initiative to attract buyers to consider them for their supplier development programmes thereby increasing their attractiveness for buyer investment in supplier development



(Golmohammadi et al., 2018). There have been reported cases of smallholder seed growers organizing themselves and approaching seed companies to attract them for contracting as seed growers. Along with that contracting then comes the supplier development efforts of seed production training and contracting.

**Seed companies' supplier development.** Seed company executives also undertake smallholder seed grower development as a form of direct supplier development where the seed company agronomists undertake seed growers' assessment, technical training of growers on seed production, including monitoring of the growers and their performance assessment. The monitoring takes the form of seed quality assessment at the end of each production cycle as determined by the volumes of seed produced that meet the quality specifications required by the seed certifying authorities external to the seed companies.

In addition to building the capacity of the smallholder seed growers, successful BLs and BEs of small-scale seed companies also undertake strict seed growers monitoring. The monitoring visits are to ensure that the outsourced seed production is in line with prescribed standards to guarantee quality seed outputs. A BL in SC 3 outlined their seed production supplier monitoring mechanisms as follows:

We monitor the crop at three levels. First one, during planting or plant preparation. Then we monitor the crop at the early vegetative stage. Then, at flowering, we monitor the growth together with the Seed Services Unit. Then we do the final assessment at reproduction, after the crop nodule formation in case of legumes. So, we actually do monitoring of the growers performance. It would be randomly selected. We can't do every grower. But, now, on their own, they have

got a committee which is very strong, which is called the Seed Committee who do regular visits to all the growers in their group. So, in our strategy, we normally recommend the Seed Committee, when we get there that we need to see the worst farmers and also the best farmers. Then the other ones, we can randomly pick.

A BL in SC 9 indicated how they invest in seed grower development. The BL also explained how they also create an incentive mechanism to induce good performance as follows:

So, we functionally run an outgrower for seed multiplication for up to about 5,000 farmers. Not incredibly innovative at this line, but we think it's probably one of the more important things that we do. We invest more time and money per farmer than anyone else that I know of working with smallholders. So, each of our farmers is visited every three weeks at their home or field, receives a training every two weeks, starting about a month prior to the growing season continuing through the growing season and continuing a month after. With these, the full financing package for their input, so that is also customized to their region and their production history.

So, every one of our growers receives a credit score, basically. We call it a grower rating, between 0 and 100. This is dependent on six factors: the quality of crop they bring in, the quantity they bring in, their side sell rate, so expected yield divided by the actual yield being sold to us divided by expected yield from yield estimates, attendance at trainings, adoption of practices, and a subjective rating from a private extension agent about professionalism. And those six factors are

weighted and the score that they get at the end of the year is what establishes their credit limit for the subsequent year.

#### **Theme 4: Product and Market Differentiation Innovation Model**

Small-scale seed company business leaders that developed sustainable strategies for closing the innovation gaps in smallholders' markets designed suitable product and market differentiation strategies. They turned the existing seed technologies inventions into seed innovations through successful commercialization in smallholders' market.

**Importance of Seed Sector.** A functional seed sector is critical for diffusion of seed technologies to farmers for productivity enhancements and containing food prices for consumers. There has to be solvent demand for the seed to enhance the growth of the seed companies (Erenstein & Kassie, 2018). Seed systems can be classified as formal or informal with the former including institutionalized seed producers and seed companies in both public and private sector. The informal seed sector is premised on informal exchanges amongst farmers and tends to be very localized.

**Innovation versus Invention.** Innovation is both the “process and outcome of creating or inventing something new and valuable that produces broader effects in the economy and technological advances” (Edwards-Schachter, 2018, p.66). There is a difference between invention and innovation with the latter entailing the successful commercialization and marketing of the invention. An invention is not an innovation until there are commercial transactions involved. It is important to note that innovations do not necessarily lead to a tangible product as it can be a new way of doing business and also that there can be different forms of innovations to processes or recombination of ideas (Edwards-Schachter, 2018).

All the seed company BLs and BEs who participated in the study, had ready access to quality seed breeds (inventions) that are made available through the government research efforts supported by the CGIAR institutions under open license. A lot of these seed varieties have not been commercialized and the small-scale seed companies innovated by commercializing those seed varieties. Given that these seed varieties are generated from the public research institutions, the seed companies are hardly accorded intellectual property rights and when these rights are granted, it is for a limited five-year period. The seed varieties/inventions therefore remain as open innovations with no excludability features (Poku et al., 2018). The terms of competition of the seed companies are therefore on price and marketing efforts as the seed varieties have no excludability aspects unlike hybrid seeds (Poku et al.).

Table 3

*Small-Scale Agribusiness Seed Product Portfolio*

Seed	SC 1	SC 2	SC 3	SC 4	SC 5	SC 6	SC 7	SC 8	SC 9
OPV maize	X	X	X	X	X	X	X	X	X
Hybrid Maize	X		X			X			
Groundnuts	X	X	X	X	X	X	X	X	X
Beans	X	X	X	X	X	X	X	X	X
Mung Beans									X
Soya beans		X		X	X		X		
Sorghum	X		X	X					
Finger Millet	X		X	X					
Pigeon peas		X			X	X			

BLs and BEs in small-scale agribusiness seed companies that have successfully closed innovation gaps in smallholder markets have a wide range of customised seed

products and marketing strategies to reach the smallholder customers. The business leaders focus on drought tolerant, early maturing, and high oil and protein content seed varieties. Business leaders in all seed companies indicated how their product range is well suited to the requirements of smallholder farmers. One BL in SC 3 narrated how they match their products to the smallholders' microclimatic conditions:

Then what we have also done is to say what crops can be grown and we have matched the particular crops to the particular areas, even when we are talking of Mwenzezi district. Within that district, we actually even look in what the particular microclimates to actually match specific crops to the farmers. Say this was a bit drier, then we would say this area would only go for sorghum seed. In instances where we find an area a bit wetter, we go for maize and other crops. So, there's been proper stratifying of crops according to microclimates. And then after that, the farmers in the particular areas are formed into a production committee which actually look after each other in terms of seed production.

A BL in SC 5 indicated their product range and how the smallholder farmers have accepted the seed technologies. The BL explained their seed products value attributes:

We have NUA beans. Now, this is another drought-tolerant, early maturing variety, NUA beans. So NUA beans is another drought-tolerant, early-maturing, and also very high-yielding. It's a red kidney bean. On the smaller side, but it's very, very tasty. The farmers really like it. Actually, they call it, in our local language, *munyambatira*. It means finger-licking. You lick your fingers. You lick around your lips or your fingers. So, we call it *munyambatira* in our local language.

**Differences between BMI and product and service innovations.** There are two main distinctions. First, BMI is a process that is driven at a strategic organizational level by strategic or top management rather than at a functional level and “has higher strategic importance than product and service innovation” (Geissdoerfer et al., 2018, p.169). Second, product and service innovations are about diversification and how to integrate new products and services into the portfolio while the BMI is about new ways to generate value for customers and capture value or extract value from the market. Third, the risk configurations involved in product and services innovations are way lower compared to those involving BMI. For instance, a BMI can lead to wholesale business failure while R&D efforts on a product or service only entail failure at a localized level (Geissdoerfer et al.). Fourth, product and service innovations entail retention of the existing customer base while the BMI dimension can change the customer base completely.

**Seed Companies Product Portfolio.** All the seed companies had a diversified seed portfolio with seed being their core business covering maize, groundnuts, pigeon peas, sorghum, rapoko, finger millet, beans, and mung beans crops that tend to be neglected by the large MNC seed companies but in high demand among the smallholder farmers. There is widespread recognition that private sector seed companies can effectively undertake seed production and marketing activities provided they have access to the right regulatory framework, access to improved seed breeds, and good business operating environments.

**Determinants of Seed Adoption.** There are elements that determine seed adoption by farmers: (a) acceptability as measured by the right seed variety and the quality of the seed, (b) accessibility of the seed: how the seed is marketed and sold, (c)

affordability of the seed: how farmers access the seed and are facilitated to purchase the seed, and (d) attractiveness: the rate of return on the purchased seed (Wageningen, 2018). Small-scale have addressed these features through focusing on high yielding, drought-tolerant, and early maturing seed varieties that also have market appeal in commodity markets or have attractive use features such as high oil content, high zinc and protein content, and poundability.

**Proximity of seed company and smallholders.** The formal seed system is characterised by a large distance between the seed growers and the seed users whereas in the informal seed system, there is close proximity between seed producers and seed users. The small-scale seed companies have taken features of both seed systems. They have specialized seed production and yet at the same time are very close to smallholder seed users. They have achieved this hybrid model by recruiting and training smallholder farmers as seed users whom they link with their seed specialists. These smallholder seed growers become the lead innovators that propel seed adoption by their fellow smallholder farmers who previously did not adopt improved seeds.

A BL from SC 3 explained the link between their seed production model and smallholder farmers innovation adoption. The BM is based on enhancing the smallholders experience growing the seed technology as a trigger for innovation adoption as follows:

I think the very first and primary thing is to say you are doing the seed with the smallholder farmers. So, in a way, they're still obliged to buy your seed because they are supporting their own company. So already that gave us an edge. So that's number one. Number two, the prices of our seed being OPV. So, it means the

production costs are relatively low compared to hybrid seeds. So certainly now, because our pricing against hybrids is quite low, so you would find with the income levels of smallholder farmers around Zimbabwe, they are better off with our seed than with these hybrids, which at the end of the day, because of the rainfall pattern and climate change, they'll still get a ton per hectare for that. So, at the end of the day, it wouldn't make sense to buy a 15-ton potential seed. Very expensive, but you still get 800 kg per hectare. So that has really given us an edge. In terms of agrodealers, they are countless. We have got a wide distributorship. I cannot say them offhand. We have agro-dealers. We do direct distributions to farmers.

A BL in SC 2 stated how they shorten the adoption cycle for smallholders. The BM is predicated on shortening the smallholders distance travelled and cost to access seed:

What is done is through our model, is we have now created what we are calling an agrodealers network within the farming communities. So, when the seed is processed, it's put in these particular agrodealership so that the farmers within the area can easily access that seed. But even when they want to access grains, they will be able to access it within the agro-dealer shops.

Another BE in SC 4 indicated how they enhance smallholder farmers access to their products. The BM is based on utilising smallholders as seed stockists to sell the seed to other smallholder farmers:

We've got what we call village-based agents (VBAs). These ones, we go in a community. We contact the local government agricultural extension officers to help us to identify good representatives who are farmers in the locality. And then



we contract those farmers to sell seeds on our behalf in the locality. So, this one, we have done this in a few areas like Filabusi, Domboshava, Wedza, where farmers demand that seeds come to them. They don't want to go to local shops or the ones listed in their locality. So, we pick a representative within that locality who will sell the seed on their behalf. It cuts on costs.

From our strategy we actually thought we should pursue it; it's a very good model. One advantage of it is it retains loyal customers once we establish in localities. When we move in, we do demonstrations, demonstration blocks. They are able to pick specimens of our varieties. And then they say, 'This is what we want to grow.' So that's how it works.

A BL in SC 5 stated how the seed company staff constantly learn from the smallholder farmers and integrate that into their value proposition. The interactions with the smallholders provide the BL with market insights:

And also, my staff in the outreach to farmers go into various places to talk to people, socialize and get back to me with the feedback. I've already gotten the other feedback, which I appreciate, from some of the agro-dealers from last year. They were saying quality protein maize needs to be given a more local but a more attractive kind of name. One of the varieties that is well known, from my company is Kanyani. It grows very, very fast. It runs in its growth like a monkey. A monkey runs fast. So, they call it Kanyani. Even Kanyani is like a small monkey, runs faster, implying the fast growth of the seed variety in the field. So, I need to think of the variety names that can be catchy.

**Facilitating farmers' access to quality seeds.** Producing improved high-quality seeds is only one aspect of the seed system. The seeds have to be accessible to the farmers in terms of cost and physical distance. The small-scale seed company executives distributed their seed through agrodealers that are based within walking distances of smallholder farmers, they produced their seed within the communities therefore reducing the transaction costs of seed redistribution with their seed only transported within 50-kilometer radius instead of over 300 kilometers as is the case for most large-scale seed companies. The companies also facilitated farmers' access to finance through banks and MFIs or commodity outgrower schemes. The companies also established crop demonstration sites at which farmers are given promotional seed to grow and other farmers are invited to seed the performance of the seed. This practice is in line with studies that demonstrated that the return on seed investment is anything between 20% and 70% depending on the type of seed such as Wageningen (2018). Affording the farmers, the opportunity to trial the technology is another trigger for investment or adoption of improved seed varieties.

**Link between seed and commodity value chains.** The other innovation made by the small-scale seed executives is the link between the seed systems and commodity value chains. Where the seed system ends are the beginning of the commodity value chain (Wageningen, 2018). In this regard, the small-scale seed executives have closed the loop between the two systems (seed and commodity) by setting up sister companies that buy the produce, setting up processing facilities that add value to the produce from the farmers, and creating offtake arrangements between the farmers who buy their seed and the commodity buyers who require their produce. That way smallholder farmers are

assured of a return on investment on their seed purchases as they have guaranteed markets that warrant their investment in high value improved seeds sold by the small-scale seed companies.

A BL from SC 3 indicated how they close the seed and grain value chain loops. The business model is about enhancing the profitability of the smallholders to enable them to be better seed customers.

I think that's one of the aspects where we have engaged for farmers with what commodity, with what seed, so they should have the market for their commodity. That's one of the key things we really want with farmers, to try to get results because for them, once the value chain is complete, then they can easily be in that value chain post-harvest. I think it has been very good because most farmers produce good products, but their challenge is to say they don't have market linkages and our initiative offers them a market outlet.

A BL in SC 2 stated the interlinkages between seed technology adoption and securing markets for smallholder farmers for their produce. The BM is premised on enhancing smallholder market access for their produce as a trigger for them to adopt seed technologies:

So, we have a stage where we are identifying different groups that produce and offtake the seed to produce the grain. And when we've done for this particular year through our own agro-dealers, we are telling them to sell. So those who are procuring the seeds, we will provide the buyback on the grain as well so that we start mobilizing the grain that we know the quality of-- the quality that we are giving them. And we know the traits of the products. That is easy for us to

market the products internationally. Because everybody wants to certification of the product, we are selling to them.

### **Theme 5: Value Chain Partnership Innovation Model**

Small-scale agribusiness seed company business leaders who closed the innovation gap in smallholders' markets created effective value chain partnership innovation models. This type of innovation qualifies into what Martin (2016) classified as dark innovation. It is defined as those innovations that go unnoticed because they do not come in the form of the traditional R&D innovation efforts characteristic of technological innovations (Martin, 2016). Such innovations are not measurable through the traditional innovation measurement indicators and remain below the radar moreso in developing economies especially within the social innovation space (Edwards-Schachter, 2018).

A BM reflects how an organisation creates and captures value, its underlying logic. To achieve sustainability, BMs require cooperation with different actors beyond the boundaries of the firm and navigate value transfers with up and downstream actors (Brehmer et al., 2018). Small-scale agribusiness seed executives have to navigate these value boundaries as they mostly rely on up and downstream value chain partners to create and deliver value.

A BE in SC 3 indicated how they have a range of value chain partnerships. The BE focused on how the value chain partnerships add value to their seed business:

We work with agrodealers, smallholder farmers as seed growers and farmers as customers, and the Seed Services Unit which provides us with plant breeding material and also inspects and certifies our seed. The primary and the most important value chain actor for us is the Department of Research and Specialist

Services, particularly, the Crop Breeding Institute. The seed guys. These are the guys who breed the seed that we then use. So, I think it's one of the major value chain partners that we work with. Then we also work with other NGOs like CIAT. CIAT is involved in promotion of biofortified products. And under NGOs, we have quite a number of them who are interested in small grains and cow peas whom we sell our seed through for adoption by smallholder farmers.

Another BL of SC 6 underscored the importance of their value chain partnerships.

The BL worked with several value chain partners.

That is a quite a lot of buzz. Chief being the farmers, then distributors of seed, and then we deal with the banks. We also get funds, and then we link farmers as well as the financing. So, it's banks and microfinance guys, yeah. Then we also deal with, in terms of distributorship metric, yeah, your Farm and City, your Blue Cross, in terms of distributorship, so the agent distribution network. We work a lot with that. Then we also deal with packaging, or maybe what can I say? agrochemical suppliers. Then we also work with government departments. These would be the government backed extension and the local authorities more on the political side. We also work with the seed inspection unit.

**Firm versus multi-stakeholder collaborative innovations.** the early innovations called the Schumpeter Mark 1 centered on individual heroic innovators before it was replaced by the Schumpeter II where innovation was driven by large firms. The third wave of innovation is under the auspices of creative destruction under innovation ecosystems in which information exchanges, problem solving, and mutual learning take place within clusters (Edwards-Schachter, 2018).

It is within this innovation domain where developing and poor countries are innovating and represent a large opportunity to serve excluded customers with net social impact. A number of BMs are emerging in that sphere challenging conventional BMs with new supply chain and BM configurations (Edwards-Schachter, 2018). Christensen, Raynor, and McDonald (2015) argued that a novel BM is more important than a novel technology with a bad BM. The agribusiness seed BMs in southern Africa demonstrate the value of innovation around BMs by providing improved seed technologies which are inferior to the ones offered by MNCs which are unable to penetrate the low-income smallholders market.

**Networking Capabilities.** This capability is about creating connections and interdependencies inside and outside the organisational boundaries through coordination, customer connectivity where trust relationships thrive, and stakeholders are integrated, and interconnectivity creates the small word effect (Battistella et al., 2017).

**Social Innovation.** this innovation dimension is driven by innovation purpose to solve societal needs by changing social processes through social technical processes or social inventions. The key distinctions are (a) innovation led by social activists, (b) collaboration between the social activists and other market players from both the private and public sectors, and (c) occasions changes to the production systems. The small-scale seed companies fit this description particularly those that are from female activists who established seed companies to solve nutrition challenges faced by women by developing and marketing improved seeds of nutritious crops neglected by mainstream MNC seed companies. A workable definition of social innovation (SI) puts it as the coming up with

new idea about “how people should organise interpersonal activities, or social interactions, to meet one or more common goals” (Mumford, 2002, p.253).

Lundvall (2016) emphasized the ‘social recipe’ that promotes the adoption of technological innovations through new institutions a typical phenomenon among small-scale seed companies that have smallholder farmer customers as supply chain partners n new social constructs to enhance their technological adoption while addressing their food, nutrition, and income security societal needs. Lundvall (2016) called these grassroots social innovations driven by social demand and premised on social inclusive open innovation (Gupta, Dey, & Singh, 2017). In the mainstream, SI are noted in the gig economy BMs of Airbnb or Uber that create marketplaces that enable multiple transactions while in the seed industry, the small-scale agribusiness seed companies demonstrate social innovations in BMs to deliver improved seed technologies.

Typical examples from the study include how agribusiness seed executives link various research organisations to provide research and development support as well as their work with smallholder farmers, NGOs, and government agencies.

A BL in SC 7 indicated how working with value chain partnerships enabled several small seed companies to establish a collective business model. The BLs used their collective capabilities to advance their seed companies.

We are also working with a partnership of women in the field systems development and transformation, seed taxes and so forth so that it's known as African Women in Agribusiness. So, this is like an umbrella body for, at least for now, about 10 women owned seed companies. We have said we want to transform involvement of women by reducing inequalities and imbalances in the

seed systems industry in our country. By starting with ourselves, where we want to reduce those inequalities as pertaining to women because it seems like most of the imbalances and inequalities pertain to women. And that's where we have also come up to find out that it's important to consider issues that may prevent seed companies performing better because they are leaving women behind in the area that they take everybody like men and yet, women do not have enough assets or valuable assets that can make them qualify for large loans.

Owning a seed company is something costly. You need educated researchers who can do research like scientists. But those are not cheap to manage in a company. And the whole production processes, it costs a lot of money. And especially when you're working with smallholder farmers, it has to have a very strong training component. And yet, when women are left behind, that has led, in the wider community, to not meeting seed demands annually. So, we are looking at it in this way. We are saying there have to be some trade-off. Sometimes you have to reduce the levels of profit maximization goals and/or to meet costs of farmers training, costs of research, cost of employing capable people, and things like that. So what mitigation measures can be in place to mitigate these trade-offs? Like working with guarantors.

### **Theme 6: Measuring Business Innovation Performance**

**Seed Company Success.** A seed enterprise is considered successful when it has a reliable farm customer base to whom it sells improved seed varieties of good quality at the right time and affordable prices to those customers (Wageningen, 2018). The company should also be able to overcome the cash flow challenges related to managing a



seed company given the long lead times between seed production and seed marketing of between 3 to 6 months. Such success is measured by the number of years a company has been in business and providing consistent high-quality seed to its farmer customers. All the seed companies in the study had operated for at least 5 years and were in expansion mode indicating that they had successfully established BMs and were increasing their market share in the smallholder farmers markets.

In terms of seed executives relationship management with their seed growers, they make efforts to build effective long-lasting relationships with seed growers. The business leaders measure the effectiveness of their business innovation from the perspective of the company and that of their smallholder farmer customers. They are as interested in smallholder farmer customers profitability as they are in their own company profitability.

One BE in SC 6 indicated how they measure innovation performance. The company innovation performance was based on the performance of the farmer.

We look at the volume and value that we trade coming from smallholder farmers. Then we also measure effectiveness. When we see the smallholder farmers who have become successful farmers of our seed and depend on benefits, they are deriving from the seed business, in terms of what they can do with the resources they get, they are a source of encouragement and success. To us, we feel that that's a key area.

Another BL in SC 3 outlined the key performance metric in their smallholder farmers' innovation adoption model. The company BEs' focus was on the farmer customer.

We measure by what the farmers are producing. Because when we started, on average, each farmer was producing about 600 kg per hectare, but as we speak now, our farmers have more or less doubled or tripled that. Because as I said, on average now, our farmers on our scheme are producing like 1.5 tons per hectare.

Yet another BL in SC 8 shared their company innovation performance metrics. The focus of the metrics was on different staff roles as follows:

We have goals which form like the yardstick of performance. And at activity level, we have key performance indicators in place which are made clear to all employees for their area of authority or their mandate. And when we are doing performance evaluation and/or performance appraisals for our employees, those form the yardstick. And so, we don't just have to do the haphazard, where to say, "We have succeeded," no. We have a base for measuring that.

Yet another BL in SC 9 indicated how they relate staff performance to smallholder farmers' performance. The BL outlined their company innovation performance metrics:

Whenever we strategize operationally as well, and especially around internal communication, we do focus on that one figure and the message that you just outlined. And we try and inform everyone on the team at every level how their work and the metrics that they're judged on contribute to the welfare of the company and really what that means instead of just being an abstract profit figure. So, for example, if a field supervisor has a metric to get their farmers to 98% loan repayment and another metric to get them to 67% of commercial yield ceiling, those are at first glance just impact metrics, but we're pretty open with our

finances internally so that we can have discussions about how those metrics tie directly into the health of the company and vice versa. So, one thing that I see a lot with local enterprises is people are just really, really guarded with information, especially financial information, even when it's an investor asking for it. And that's going to kill deals. I'm dealing with one right now, with a friend who just won't-- they won't even pull together a one-pager because they're afraid to share something externally to someone that they don't know. A one-pager that has historical profit figures on it. And I just consistently push people saying, "You've got to let go. You've got to grow and have material agreements. And to scale these things, you have to be willing to talk about your successes and your failures."

The BM is a vehicle for innovation and an innovation in itself (Edwards-Schachter, 2018). The BMI has components of value proposition, and revenue generation mechanisms and the required enterprise cost structure and profit potential. At the heart of the BMI is the “change of an existing BM or creation of a new BM that improves its functions and satisfies customer needs better than the existing BMs” (Edwards-Schachter, 2018, p.71).

**Contractual Governance.** The contractual governance mechanism is premised on formal contracts with clear roles and responsibilities of each party based on transaction cost theory. Therefore, the contract provides for interfirm transactional relationship through third party enforcement to minimise either party’s opportunistic behaviour (Lee et al., 2018). In such contracts, roles and responsibilities of both parties are specified as are contingencies, liabilities, monitoring processes as well as penalties and remedies. Use of contracts is based on transaction cost analysis (TCA) which

advocates maximization of transaction performance while minimizing transaction costs through transactional risk management inherent in interorganizational relationships (Lee et al.).

**Relational Governance.** this model of managing interfirm relationships is premised on maximizing the “values and agreed upon procedures which exist in social relationships” (Lee et al., 2018, p.289). The key features of this governance mechanism are social control dealing with soft issues such as trust, norms, open communication, and information sharing embedded in *informal norms and self-enforcement*.

A BE in SC 1 demonstrated how they build relational governance with the smallholder farmer customers. The relationship is built on customer information.

Normally we monitor our seed performance through observations from, for example, programs like the field days. Then, two, in terms of the number of smallholder farmers customers, on our system, at the tills, we have got certain information which is captured. For example, we capture the phone numbers of the farmers. And, also, daily, we will be summarizing the number of customers at each of our outlets. So, if you take, for example, in Gokwe, in Rusape, wherever our outlets are, they're located where the smallholder farmers are. So, we can summarise and say, ‘Today, we reached, say, 200 farmers in Gokwe. Today, we've reached so many farmers in this area.’

And also, we're also using a new system called Evolution, the Pastel system, Evolution. So, we do evaluations, like weekly sales evaluations. Say, in terms of product ZM521, where was it bought most. So we can value the sales by seed

type by area and type of customers. Then in certain areas, we know that they need this crop in such an area through that valuation system.

### **Applications to Professional Practice**

The strategies used by small-scale agribusiness seed company leaders in this study to close the innovation gaps in smallholders' markets might be useful to business leaders and operations managers of any small agribusiness company seeking to close the innovation gap in smallholders' markets. The objective of the study was to explore the strategies small-scale agribusiness leaders used for closing the innovation gap in smallholders' market. First, the findings of this study are of potential value to business leaders seeking to penetrate the large bottom of the pyramid (BOP) markets that are unserved and underserved market segments for several businesses. Second, this study may also equip business leaders and managers with a better understanding of business processes, capabilities, social innovations required to navigate the myriad of innovation challenges in rural smallholder farmers' market. Research such as the one covered under the study can also provide pointed guidelines as to why some innovation strategies are not viable for closing innovation gaps in smallholder markets. Such insights can save business leaders and operations managers financial losses in replete in poorly conceived innovation strategies.

The importance of collaboration, planning and coordination in achieving business objectives is central to successful co-creation, deployment and evaluation of innovation strategies (Persichitte, 2016). One mechanism recommended by Lindgren and Munch (2016) is the creation of a technical committee to drive the innovation process. Lindgren and Munch suggested that there should also be user involvement to enhance the success

of technology adoption. While Silban (2016) recommended the use of technology committees, small-scale agribusiness companies do not have that many staff. Instead, the executive committees in the companies come together to deliberate on the innovations to deploy and how to deploy them as well as how to evaluate the performance of the innovations on the smallholder farmers. For example, most of the seed company executives held weekly meetings to discuss their innovation strategies. Two innovative strategy insights used by business leaders of small-scale agribusiness seed companies emerged from the study. First, the business leaders and operations managers created innovation committees that were not only based in their companies but roped in customers and other value chain partners. This approach enhanced the capabilities available to the business leaders of small-scale seed companies. Second, the business leaders also engaged in user involvement in technology adoption through the deployment of smallholder farmer seed customers as seed growers, effectively integrating them into their supply chains.

The results of this study may provide value to the practice of business because some small agribusiness seed company leaders are failing to close the innovation gap in smallholders' markets (McGuire & Sperling, 2016). Provision of improved empirical evidence on how small agribusiness seed company leaders can close the innovation gap and gain competitiveness in smallholder markets may better inform how investors, donors, and public entities can direct such investments in more productive ways. The findings from this study may contribute to knowledge on the potential strategies for changing increasing business competitiveness among small agribusiness seed companies in southern Africa through strategies for accelerating product and process innovations.

### **Implications for Social Change**

The implications for positive social change include the potential to enable small agribusiness seed company leaders to develop and adopt better BMIs. Agriculture is the backbone of African economies (Kansiime & Mastenbroek, 2016). Africa is home to 12% of the global population and will be home to 31% of the global population by 2050 (UN, 2016). Smallholder farmers make up 70% of Africa's population and contribute 80% of the food consumed in Africa (AGRA, 2016). The improvement of agribusiness seed companies' BMs could catalyze developing a dormant industry on which many people in Africa derive their livelihoods. Improving the BMIs of agribusiness seed companies may lead to food and nutrition security for African families currently living in poverty.

The innovation strategies identified in this research have been successfully implemented by small-scale agribusiness leaders and operations managers in southern Africa. The results of the study have potential contributions to social change by providing fresh insights into additional strategies for closing the innovation gap in smallholders market by agribusiness seed company for the vast under and unserved markets in SSA. The sharing and dissemination of such strategies may enable agribusiness seed company leaders to gain new strategic tools to deploy in closing innovation gaps in smallholders' market. Navigating resource constrained smallholder farmers markets is a costly endeavor and outlining systematic strategies used by successful business leaders has the potential to provide and guide other managers aspiring to serve similar markets and help them to reduce the cost of doing business in smallholder markets and avoid technology innovation failure. These strategies can assist other small-scale agribusiness seed

company leaders that would like to pursue business opportunities in the elusive smallholders' market with resultant employment impact.

Smallholder farmers technology adoption has triple benefits. First, it increases the market share and profitability of small-scale companies. Second, the growth of small-scale seed companies has the potential to create more jobs for unemployed business and agricultural graduates as these companies expand. The effects of the two growth scenarios above is that they can potentially increase the tax base that can enable government to finance public infrastructure such as schools, roads and clinics. Third, as smallholders adopt technologies, they enhance their farm productivity and generate more incomes for their household needs. Such income increases have the potential to lift them from poverty and allow them to invest in their children's education and solar energy. With more disposable incomes, the smallholders can also adopt further technologies beyond seeds such as solar energy for the general well-being of their communities.

### **Recommendations for Action**

In line with the conceptual framework of BMI, the findings of the innovation strategies employed by small-scale agribusiness seed company business leaders in this study and the following recommendations may apply to many business leaders and operations managers operating in the BOP markets. The first recommendation is for business leaders to plan for innovation strategies rooted in local market conditions. The study findings point to the use of structured techniques in developing business models, innovation techniques around products, social systems, and supply chain management techniques working with smallholder farmers. The evidence from the study suggests that business leaders and operations managers should be deliberate about the processes and



methodologies that they follow in strategizing innovations in smallholder markets. Toro-Jarrin, Ponce-Jaramillo, and Guemes-Castorena (2016) recommended the proper identification, and sequencing of innovation solutions by business leader through well thought out processes and methodologies.

A second recommendation is for business leaders to adopt BMI techniques of designing suitable value propositions and creating value while simultaneously considering value extraction mechanisms. Small-scale agribusiness seed company leaders in the study undertook careful identification of smallholder farmers user requirements, prioritization, and effective management of new innovations. Such proper identification of smallholders' requirements, prioritization of the technology options enabled business leaders and operations managers to deploy and integrate new innovations into their company product and service portfolios to close the smallholder farmers innovation adoption gaps. For example, working with smallholders as seed growers enabled business leaders to fully appreciate the user requirements of smallholders and effective deployment of new innovations in smallholders' market.

Business leaders serving the BOP may use the results of this study to develop innovative business models that deliver customised value propositions to smallholder customers while extracting remunerative financial returns. It is my recommendation that business leaders take the time to understand the dynamics of the smallholders and devise BMI that are sustainable and specific to the market realities in the BOP which should deliver both economic and social impact.

A third recommendation is for business leaders of small-scale agribusiness seed companies should harness the value of innovation ecosystems. Small-scale agribusiness

leaders do not always have all the resources they require to undertake huge research and development outlays. In that regard, they should seek to work with value chain partners and other players in the public, academia, and civil society space to leverage networks, capabilities, and financial resources. Successful small-scale agribusiness leaders worked in innovation ecosystems and leveraged resources and capabilities from their innovation ecosystem to good effect. Such leverage is akin to what Edwards-Schachter (2018) called dark innovation, which is innovation bound in social systems.

Lee et al. (2018) posited that cultures that are steeped in high social networks require more relational than contractual supply chain relationship mechanisms. The study finding that small-scale agribusiness leaders worked with several smallholder farmer seed growers with no legal contracts, but social contracts is quite telling. The business leaders transferred the responsibility to the smallholder seed growers to self-regulate and if they failed to meet the minimum requirements, they would stand to lose their privilege as seed growers, an attractive role in the community as an innovation leader. It is my recommendation that small-scale agribusiness leaders should understand the social contexts of the markets they operate in and customize their value propositions and supply chain relationships.

The study is of potential benefit to business leaders and operations managers as they may use its results to be more focused on the processes and systems that are workable in the smallholders' market. The study results might be usefully shared via peer reviewed electronic media, literature conferences, scholarly research, professional and business journals. Agencies promoting small-scale agribusiness seed companies may find the results of this study beneficial for enhancing their programme support activities and

developing customised training manuals on closing innovation gaps in smallholders' market.

### **Recommendations for Further Research**

While this study has generated some insights into what strategies small-scale agribusiness seed company leaders and operations managers use to close the innovation gap in smallholders' market, more empirical research on innovation adoption by the smallholders is required. One of the limitations of this study is that it only covered small-scale agribusiness leaders and operations managers in countries of southern Africa. While such a study is innovative as a first in the agribusiness space focusing on business models, there are geographical differences in East and West Africa that warrant further studies of the innovation strategies used by small-scale agribusiness seed company BLs and BEs in those geographies.

### **Reflections**

The objective of this study was to explore the strategies small-scale agribusiness leaders and operations managers used for closing the innovation gap in smallholders' market. The doctoral journey in pursuit of answers to this question was a demanding yet fulfilling one which I took with zeal and stamina. The quest to establish what strategies business leaders used became my pre-occupation over the last 3 years as I set to read around the agribusiness seed industry, BMI, and innovation ecosystems. I found the literature review very beneficial to my learning as well as application of new concepts in my business consulting on business models. I continued with literature review beyond the requirements of the doctoral proposal because of the symbiotic relationship between the study topic and my consulting company's assignments. I am grateful for having the

opportunity to study for a doctorate as I am the first on both sides of the family to undertake a doctoral study. I was determined to complete it and demonstrate to the others that it is possible, and they can also emulate me. The study participants I interacted with were a source of inspiration as they encouraged me and also challenged me to complete the doctorate and be useful to their business growth aspirations. I have a social contract with those business leaders to complete my doctoral studies and contribute to innovative solutions to closing the innovation gap in smallholders' market.

### **Conclusion**

Small-scale agribusiness seed companies are an important source of innovation for smallholders in the SSA region (Poku et al., 2018). Business leaders and operations managers can develop and deploy innovation strategies that successfully close innovation gaps in smallholders' market. Business models need to be customised to suit the specific smallholders' circumstances. Smallholder farmers need to be integrated into small-scale agribusiness seed company supply chains and small-scale agribusiness leaders need to enroll other players through innovation ecosystem principles to leverage resources and capabilities.

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## Appendix A: Interview Protocol

Participant Pseudonym: \_\_\_\_\_

Participant Code: \_\_\_\_\_

Date of Interview: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

What I will do	What I will say.....script
1. Welcome the participant	Hello and welcome!
2. Introduce the interview session with greetings and introduce self.	<p>I would first like to thank you for accepting to participate in this study as a key informant.</p> <p>My name is Golden Mahove and I am a doctoral student at Walden University.</p> <p>The purpose of this is to explore strategies that business leaders, like yourself, use to close innovation gaps in smallholders' markets grow your business in the smallholders' market. The interview should not take longer than one hour of your time. During this one hour, I will ask you a series of questions that will allow me to gain a deeper understanding of business strategies you use to close the</p>

	innovation gaps in the smallholders' market.
<ol style="list-style-type: none"> <li>3. Turn on the recorder.</li> <li>4. Introduce participant with the coded identification and note the date and time in the journal.</li> <li>5. Begin the interview with question #1 and sequentially ask all the questions.</li> <li>6. During the interview, observe non-verbal cues, paraphrase as needed and ask follow-up questions.</li> </ol>	<ol style="list-style-type: none"> <li>1. What is your company background and what motivated you to start your seed company focusing on smallholders' markets?</li> <li>2. What strategies are you using to close your company's innovation gap in smallholders' markets?</li> <li>3. What product and service innovations were introduced in your company over the past couple of years as a result of your company's strategies?</li> <li>4. How did you strategize to undertake each of these product and service innovations?</li> <li>5. What strategies did you employ to grow market share in smallholders' markets?</li> <li>6. What, if any, are your value chain partnership strategies for the development and delivery of product</li> </ol>

	<p>and service innovations to smallholders' markets?</p> <p>7. How do you measure the effectiveness of your company's strategies for closing innovation gaps in serving the smallholders' markets?</p> <p>8. What additional information would you like to share about your company's strategies to close the innovation gap in smallholders' markets?</p>
<p>7. Wrap up interview</p> <p>8. Discuss member checking with the participant</p> <p>9. Thank the participant for taking part in the interview. Give contact details to participants for follow up questions and concerns if need be.</p> <p>10. Turn off the recorder</p>	<p>I would like to express my profound appreciation for your participation in this research study. I would like to once again assure you that your identity is completely confidential and will not be disclosed in this or any other future research.</p> <p>As part of the data analysis, I would like to schedule with you a member checking interview. During this interview, I will ask you to read a report of my interpretation</p>

	<p>of your responses to the interview questions to confirm that I have accurately captured your responses. In addition, you will have the opportunity to confirm or correct any of my interpretations of the data from the data you provided.</p>
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## Appendix B: Email Invitation to Participants

Dear (Participant),

My name is Golden Mahove. I am a doctoral candidate at Walden University. I am writing to invite you to participate in my research study. The purpose of my study is to explore strategies that business leaders use to close the innovation gap in the smallholders' market. My plan is to interview at least one Chief Executive and two managers in two agribusiness seed companies in this multiple case study.

Should you be interested in participating in this study, please review the attached informed consent form and feel free to ask me any questions that may arise from this invitation or the attached form. You can reply to [golden.mahove@waldenu.edu](mailto:golden.mahove@waldenu.edu), call my South African number (+XXXXXXXXXXXX), or contact me by Skype (XXXXXXXXXX). The first two volunteer CEOs and their two respective managers will be accepted for the study as potential study participants. If you accept this invitation and are selected for this study, I would like to schedule a Skype call meeting at a mutually convenient time to discuss the purpose of the study and review the informed consent form so that you fully understand your participation in this study.

If I receive more agribusiness seed company CEOs and managers volunteers for the study than the required number or have collected a sufficient amount of data, I will notify you by email of your status as a research participant.

Thank you for considering my invitation.

Faithfully,

Golden Mahove

Doctoral Candidate

Doctor of Business Administration: Innovation Management

## Appendix C: Data Collection Instrument for Interviews

### Interview Questions

1. What is your company background and what motivated you to start your seed company focusing on smallholders' markets?
2. What strategies are you using to close your company's innovation gap in smallholders' markets?
3. What product and service innovations were introduced in your company over the past couple of years as a result of your company's strategies?
4. How did you strategize to undertake each of these product and service innovations?
5. What strategies did you employ to grow market share in smallholders' markets?
6. What, if any, are your value chain partnership strategies for the development and delivery of product and service innovations to smallholders' markets?
7. How do you measure the effectiveness of your company's strategies for closing innovation gaps in serving the smallholders' markets?
8. What additional information would you like to share about your company's strategies to close the innovation gap in smallholders' markets?