MODELLING AN AGRICULTURAL-ENTREPRENEURIAL DEVELOPMENT RESOLUTION

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DECLARATION OF ORIGINAL WORK

I, Uapirama John Kavari, declare that the thesis, which I hereby submit for the degree PhD in Entrepreneurship at the Department of Business Management, Faculty of Economic and Management Sciences, University of Pretoria, is my own work, except where duly indicated, and has not previously been submitted by me for a degree at this or any other tertiary institution.

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ABSTRACT

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Entrepreneurship has been proven to contribute to employment creation and economic development in both developed and developing countries. It is increasingly being recognised as a vehicle for bringing about transformation to production methods and processes through innovation, and it is also believed to result in greater efficiency to the agriculture and other extraction industries. Researchers have demonstrated that entrepreneurship can be enhanced if an enabling environment that promotes entrepreneurial activities is fostered. It has also been acknowledged that research in agricultural entrepreneurship has not progressed as much as in other spheres of social science. To date, there are no scientifically published models focusing on entrepreneurial performance in an agricultural context. Such a model is needed in order to promote entrepreneurially oriented agricultural practices, potentially providing a solution to the challenges in the agriculture sector.

This study aims to fill this gap by developing an agricultural-entrepreneurial development model that provides a basis for enhancing entrepreneurial performance in the agriculture sector. Drawing on literature in the fields of entrepreneurship and agriculture, the study identifies and uses relevant constructs to develop the conceptual model and statistical

model, with the aim of measuring entrepreneurial performance. In this context, it is necessary to establish whether the identified constructs, individually and collectively, measure entrepreneurial performance.

In the empirical section of the study, a cross-sectional research design is used to collect data from farmers targeted by the land reform programme in Namibia. The data collection instrument is a structured questionnaire which is informed by validated scales with a bearing on the constructs of this model. The sample is drawn from farmers benefiting from the National Resettlement Programme (NRP), and the Affirmative Action Loan Scheme (AALS), administered by the Ministry of Lands and Resettlement, and Agribank, respectively. The study employs the Structural Equation Modelling (SEM) statistical technique, specifically Partial Least Squares (PLS-SEM), to examine the relationships between the exogenous constructs (supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies, agricultural sustainability) and the endogenous constructs (entrepreneurial performance and entrepreneurial outcomes).

The results reveal that supportive environment, entrepreneurial orientation and agricultural sustainability, have a positive impact on entrepreneurial performance, and that cooperative environment and entrepreneurial competencies do not influence entrepreneurial performance. The results also reveal that entrepreneurial performance in an agricultural context leads to agricultural productivity and increased incomes for farmers, but it does not improve their livelihoods.

The study, whilst serving as a useful framework in policy formulation for agricultural entrepreneurial performance, and therefore agricultural growth, highlights areas where further research is required in order to solidify the field of entrepreneurship with a lens on agriculture. It is hoped that it will spur other scholars to advance research in the discipline of entrepreneurship, particularly agricultural entrepreneurship.

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CHAPTER 1
INTRODUCTION AND BACKGROUND TO THE STUDY

1.1   INTRODUCTION

There is acknowledgement that programmes designed to improve productivity in agriculture in some Sub-Saharan African (SSA) countries have not yielded the desired results. Researchers (Cousins & Scoones, 2013; Lahiff, 2007; Werner & Odendaal, 2010) lament the lack of holistic approaches to agricultural productivity, particularly with regard to land reform in Namibia and South Africa. There is, therefore, a need for the design of a system that would enhance productivity within the agricultural sector in developing countries, including the above-mentioned.

Entrepreneurship is recognized as a significant conduit for bringing about transformation to sustainable products and processes, with numerous high-profile thinkers advocating entrepreneurship as a possible solution for many social and environmental concerns (Hall, Daneke & Lenox, 2010).

Kelley, Bosma and Amorós (2010:12,60) are of the view that entrepreneurs drive and shape innovation; speeding up structural changes in the economy, and bringing greater efficiency to the agriculture, extraction and other industries in their development stage. This is supported by the work of Richards and Bulkley (2007:7) and Valliere and Peterson (2009) who posit that entrepreneurs are vital for growth by exploiting innovation and implementing imitative ventures that harness under-used resources. They also claim that the prevalence of technology and competitiveness in the agriculture industry are the result of entrepreneurial attributes of farmers.

According to Gowrishankar (2008:95), entrepreneurial behaviour continues to be seen as an important path to competitive advantage and improved performance in firms of all types and sizes. Giving further credence to the importance of entrepreneurship is the assertion by Ghiasy and Hosseini (2012:721) that entrepreneurial cooperatives in agricultural development contributes to the economic empowerment of poor people living in rural areas, and create more jobs and employment sustainability.

Agriculture, one of the priority areas in the Millennium Development Goals (MDCs), has been recognised as a vital tool for eradicating poverty and hunger (Bach & Pinstrupp-Andersen, 2008:1). The MDGs have been replaced by the Sustainable Development Goals (SDGs), with poverty eradication still being a priority (SDG 1). Three out of every four people in developing countries live in rural areas – 2.1 billion live on less than $2 a day and 880 million on less than $1 a day – and most depend on agriculture for their livelihoods (World Bank, 2008:1).

Agriculture is particularly important for SSA, of which the Southern Africa Development Community (SADC) is part. This region occupies close to half of the potentially available land for rain-fed cultivation (World Bank, 2011:18-19). Notwithstanding, the agricultural sector has long been neglected in terms of policy focus and resource allocation. Bach and Pinstrup-Andersen (2008:2) point out that public spending for farming is only 4 per cent of total government spending and the sector is still taxed at relatively high levels. They further argue that public spending on agriculture as a share of agricultural Gross Domestic Product (GDP) in SSA is less than half that in other regions, and less than half the New Partnership for Africa's Development (NEPAD) target of 10 per cent of the national budget.

Furthermore, 10 SADC Member States have recorded negative growth in agricultural spending as a percentage of total spending, with 6 of them (DRC, Madagascar, Mozambique, Swaziland, Tanzania and Zimbabwe) performing below the SSA average of -4.1 per cent. Namibia recorded a positive growth of 15.6 in agricultural spending as a percentage of total spending (Benin, Kennedy, Lambert & McBride, 2010:77).

Given the importance attached to agriculture, for the role it plays in poverty alleviation, and the neglect it has been subjected to by governments in terms of policy focus and funding, it is of cardinal importance that measures are put in place to resuscitate this crucial sector of the economy. Considering the benefits attributed to entrepreneurship, including, agricultural activities, promoting entrepreneurially- oriented agricultural practices could be one possible remedial action.

In line with the definition of entrepreneurial activity by Ahmad and Seymour (2008:9), agricultural entrepreneurship may be defined as the generation of value, through the creation or expansion of agricultural activity, by identifying and exploiting new products, processes and markets. This is the definition adopted in this study. Literature has revealed that research in agricultural entrepreneurship has not advanced as much as it has in other

spheres of the social sciences. Richards and Bulkley (2007:3) argue that there has been relatively little research on agricultural entrepreneurs given that entrepreneurial research and education have traditionally been the product of graduate business schools, with most of the practising entrepreneurs interviewed, originating from the non-agricultural business community.

It also appears from literature that none of the current frameworks and models on entrepreneurship and agriculture (including but not limited to: Antonites, 2003; Gnyawali & Fogel, 1994; Jowah, 2013; Modiba, 2009; Nieuwenhuizen & Nieman, 2014; Suman, Murthy & Chandrasekhar, 2014; Zhou, Minde & Mtigwe, 2013) have focused on agricultural entrepreneurship and specifically entrepreneurial performance, *per se*. The above-mentioned researchers have been concerned with elaborating on the various factors or constructs that have a bearing on entrepreneurship development. This, however, has not yet led to building and empirically testing a model on agricultural-entrepreneurial performance.

The investigation towards the promotion of agricultural entrepreneurship is a critical research gap that leaves many country-wide issues unsolved. The availability of an agricultural entrepreneurship model for fostering and implementing entrepreneurial principles in agriculture is of paramount importance in countries where agriculture is the main source of livelihood and economic inclusion. Such an example is Namibia, whose agricultural sector, specifically land reform, is addressed in the following section.

1.2   NAMIBIA'S AGRICULTURE AND LAND REFORM

1.2.1   Agriculture sector's structure and role

The agricultural sector sustains about 70 per cent of the Namibian population of 2 million (Bank of Namibia, 2008:5; International Monetary Fund World Economic Outlook Database, April 2015). Agriculture is regarded as an important part of Namibia's economy, which together with forestry and fishing, employed 31.4 per cent in 2013 (Namibia Statistics Agency, 2014:7). It is by far the largest employer in Namibia as Table 1.1 below demonstrates.

Table 1.1: Employed population by industry for 2013

Industry	Number of employed	%
Agriculture, forestry and fishing	215 311	31.4
Wholesale and Retail trade	79 391	11.6
Private household	57 668	8.4
Mining and Quarrying	13 558	2.0
Manufacturing	32 769	4.8

Source: Adapted from Namibia Statistics Agency (2014:7).

Namibia's agricultural sector is divided into commercial and communal farming, with both comprising mainly crop farming and livestock rearing. The commercial farming sector constitutes approximately 4,200 farmers and occupies 44 per cent of the arable land, whereas communal farmers account for 41 per cent of the agricultural land and are estimated to make up 67 per cent of the total population, 90 per cent of whom are dependent on subsistence agriculture for their livelihood (Kapimbi & Teweldemedhin, 2012:169).

Livestock farming comprises cattle, goats, sheep and pig (Ministry of Agriculture, Forestry, and Rural Development, 2009: 4). This study focuses on livestock farming, particularly cattle farming, as it is the main agricultural production sector in Namibia. It has an annual estimated value of US$128 million, of which weaner (calves less than twelve months old) exports contribute approximately US$57 million (Hangara, Tweldemedhim & Groenewald, 2011:141).

Klaus (2012) points out that besides the traditional cattle, goat and sheep farming, other livestock farming activities offer opportunities for further diversification of the sector. Opportunities beckon in chicken production and pig farming, where the latter provides only about 25 per cent of the local demand for pork products (Klaus, 2012). An entrepreneurial approach to agriculture could take advantage of these opportunities. As Kelley *et al*. (2010:60) highlight, entrepreneurs can lay the groundwork for future growth in economies and the emergence of new industries: bringing greater innovation and growth to the agricultural industry by exploiting opportunities such as the above.

1.2.2 Land Reform

Land reform includes reforms that increase the ability of the rural poor and other socially excluded groups to gain access and to exercise control over land (Prosterman & Hanstad, 2003:1). Musemwa and Mushunje (2012:4344) argue that the main long standing objective of the land reform programme in former colonised states has been to address the imbalances in land access, thereby extending and improving the base for productive agriculture in the smallholder farming sector, including bringing idle or under-utilised land into full production.

In the context of Namibia, the main objective of land reform is to ensure fair land distribution amongst all races, with the aim of providing previously disadvantaged people with an opportunity to produce their own food, improving the livelihoods of beneficiaries by enabling them to earn an income, and integrating previously disadvantaged people into the economic mainstream of the country (Ministry of Lands and Resettlement, 2010:3).

Namibia's land reform comprises four programmes, two of which - the National Resettlement Programme (NRP) and the Affirmative Action Loan Scheme (AALS) -relate to the redistribution of commercial farmland. The NRP and AALS programmes are the major land-reform programmes in Namibia and affect a larger cohort of farmers.

The main objective of the NRP is to address the problem of landlessness among the Namibian people by redressing past imbalances in the distribution of land, helping to improve the productivity of the land, and allowing the farmers to contribute to the national economy through active participation in the marketing of farm produce. By 2010, a total of 1,502,935 ha of land in the various regions of the country had been acquired for resettlement and allocated to over 3,725 beneficiaries (Ministry of Lands and Resettlement, 2010:21). By 2012, these figures had increased to 2,300,000 ha of land, and 5,008 beneficiaries, respectively, which still fall short of the target of 5,000,000 ha of land by 2020 (Haufiku, 2014:1; Werner, 2014:8).

The main objective of the AALS is to resettle well-established and professionally- oriented formerly disadvantaged Namibians (mainly from communal areas) on commercial farms, in order to help minimise the pressure on grazing in communal areas.

It also aims at assisting small-scale communal farmers with gaining ownership of freehold land so that they can develop into fully-fledged commercial farmers who would be able to market their produce and thereby contribute to the national economy. By 2010, a total of 604 farmers benefited from the AALS, covering 3,241,352 ha (Ministry of Lands and Resettlement, 2010:22). These figures had increased to 892 farmers covering 5,800,000 ha in 2014 (Shivute, 2015:7). The AALS is implemented by the Agricultural Bank of Namibia (Agribank). It gives loans against a mortgage as security for a period of 25 years, at a state-subsidised interest rate.

Little empirical work has, however, been done to assess the impact of land redistribution on the poverty levels and the livelihoods of beneficiaries (Werner & Odendaal, 2010:3).

1.2.2.1   Challenges of Land Reform

Some authors (Cousins & Scoones, 2010:31; Aliber & Cousins, 2013:140) lament the notion of focusing policy debates on land reform in Southern Africa, particularly in Namibia and South Africa, narrowly on farm productivity and economic returns. Furthermore, an implicit normative model of Large-Scale Commercial Farming (LSCF) is taken to be the most viable form of farming. Aliber and Cousins (2013:164), therefore, call for alternative approaches to land reform. These include the subdivision of commercial farms into smallholder farming units with the potential to support many rural producers and which can benefit the poor population inhabiting rural areas.

In line with the Ministry of Lands and Resettlement (2010) poverty assessment survey findings, Aliber and Cousins (2013:140) regard poor extension services to land reform beneficiaries, inadequate beneficiary skills, and a failure to subdivide large farms due to resistance from a conservative coalition of state and private sector interests as factors that have contributed to poor livelihoods and sub-standard production outcomes. Additionally, NRP and AALS farmers observed that a lack of start-up capital (to acquire livestock or satisfy cropping needs) for emerging farmers, absence of a monitoring system, non-availability of water resources on the farms at the time of resettling beneficiaries, and lack of government support to farmers during periods of drought (Ministry of Lands and Resettlement, 2010:58-60), are issues which need addressing.

In Namibia, land reform, in particular, has been beset by numerous shortcomings and challenges pertaining to both design and implementation. Werner and Odendaal (2010: 22) posit that the dominant model for resettlement is based on extensive small-scale commercial livestock farming, and disregards small-scale irrigation and game-or tourism farming. This, in their view, limits both the amount of land that can be considered suitable for resettlement, and entrepreneurial activities by beneficiary farmers.

Consequently, there is a lack of a tailored and comprehensive post-settlement support system. This scenario contributed to a situation where two-thirds of the beneficiaries have still not fully utilised the land allocated to them, and are still dependent on off-farm income for their livelihoods (Ministry of Lands and Resettlement, 2010:54).

These specific findings with regard to Namibia mirror, to some extent, the findings expounded in the above studies by Cousins and Scoones (2010), and Aliber and Cousins (2013), and call for a creative, innovative, dynamic and holistic approach to land reform and sustainable agriculture.

The purpose of this study is to build an agricultural-entrepreneurial development model that would address the challenges of land reform and agriculture development holistically.

1.2.2.2 Critical factors in land reform

The phenomenon of climate change, which affects weather patterns and often leads to droughts and floods, is projected to compromise agricultural production, especially in smallholder systems with little capacity for adaptation, particularly in many parts of Africa (Müller, Cramer, Hare & Lotze-Campen, 2011:4313). This may negatively impact food security in Africa, against the backdrop of continuing population and consumption growth, pressures on land, water, energy, overexploitation of fisheries, and the projected increase of global demand for food for at least another 40 years, as suggested by Godfray, Beddington, Crute, Haddad, Lawrence, Muir, Pretty, Robinson, Thomas and Toulmin (2010:812).

Richards and Bulkley (2007:3) opine that whilst a universal awareness of farms and farmers certainly exist, albeit subjectively, the existence of entrepreneurship in today's agricultural business community is too seldom recognized owing to relatively little scholarly

research on agricultural entrepreneurs. Lans, Van Galen, Verstegen, Biemans and Mulder (2014:41) equate entrepreneurialism in agriculture to a particular role or style by a farmer which focuses on gaining profit, efficiency, specialization, expansion and optimization of management. The authors define entrepreneurial competence as the competence related to the identification and pursuit of opportunities.

Lans *et al.* (2014:49) further highlight that the current exploration of new path-ways to growth, innovation and diversification in the agricultural sector strongly emphasises the competence development of farmers. Moreover, it advocates that initial vocational agricultural education should pay attention to entrepreneurial competence in order to give future agricultural entrepreneurs a head start. According to the authors, policy makers and researchers are of the view that equipping farmers with entrepreneurial skills results in a more effective reaction in terms of development and to the challenges presented by globalization and climate change (Lans *et al.*, 2014:42).

Morris, Webb, Fu and Singhal (2013:352-356) contend that although business skills such as selling, producing, bookkeeping, arranging financing, pricing, and coordinating logistics are essential, they do not address the unique requirements of the entrepreneurial context. There is, therefore, a need for a unique set of competencies regarding entrepreneurial action which could be developed alongside business skills, and which any entrepreneurship education programme should encompass. Duval-Couetil (2013:395) emphasises the importance of practical approaches to assessing the impact of such entrepreneurship education programmes.

Entrepreneurship education is equally important to farmers to equip them with requisite skills for productive and profitable farming.

In practical terms, however, entrepreneurship in agriculture, particularly in SSA, has not been given proper attention. Despite SSA countries tending toward the top of the factor-driven economies on entrepreneurship rates as stated by Kelly *et al.* (2010:25), Kshetri (2011:11) argues that the biggest barrier for entrepreneurial performance in the region, is the lack of entrepreneurial skills and poor management of human resources owing to poor or non-existent support structures at government level.

Kshetri (2011:11) reports a conversation among delegates during the World Economic Forum Annual Meeting 2010 in Davos-Klosters, Switzerland: "In Ghana, the

unemployment rate can easily be dealt with if most of the available resources are channelled toward entrepreneurship". This clearly is testimony to the lack of coherent policies and support structures, which should be in place to promote and enhance entrepreneurship in economic sectors, especially the agricultural sector of many SSA countries.

Namibia's agricultural sector is no exception. Studies conducted to determine the impact of agricultural productivity and land reform on livelihoods point to dismal performance as evidenced from observations and recommendations made by both AALS and NRP farmers. This begs the question posed by Biwa (2012): Are the concepts "resettlement" and "agricultural productivity" mutually exclusive in Namibia? Similarly, policy interventions in the enabling environment such as the National Land Policy and National Agricultural Policy, which were introduced in 1995 and 1998 respectively, were meant to uplift the agricultural sector. These, however, have not been reviewed for a long time, are out-dated and do not induce agricultural entrepreneurship.

The following statements as postulated in Werner and Odendaal (2010: 173) substantiate the above expositions;

> "A major criticism of Agribank's AALS is that post-settlement support is virtually non-existent".

> "Currently the resettlement programme planning is characterised by the practice of first allocating land to beneficiaries and then thinking about strategies to assist them".

> "In Hardap and Omaheke, resettlement farmers have expressed a need for practical training on technical issues, and some feel that they have inadequate management knowledge and skills".

Substantiating the above exposition is the argument posed by Thomas and Hangula (2011:701) that new technologies, new crop varieties, procurement of production inputs, marketing of agricultural output and new industries are the major challenges facing farmers in rural areas of Namibia. They also argue that perishability of agricultural products and poor infrastructures proliferate challenges facing small-scale farmers in Namibia.

In light of developments such as the above, which threaten food security, policy pronouncements by the Government of Namibia on agriculture and land reform exhibit a desire to improve the livelihoods of the majority of Namibian people. These people depend on the agricultural sector for survival, and ideally, should be integrated into the country's economic mainstream. However, over the years, the situation has been further aggravated by a lacklustre performance of both the overall economy and the agricultural sector. On average Namibia's economy recorded a growth of 4.5 per cent for the period 1991-2014 (Bank of Namibia, 2014:117; International Monetary Fund World Economic Outlook Database, April, 2014). This is below the SADC regional target of 7 per cent required for meeting the MDGs/SDGs. At SADC regional level, Namibia faces similar challenges that afflict other Member States in terms of agricultural productivity. These include price formation and stability, poor marketing and distribution systems, poor access to financial markets, unspecialised transport systems, weak research and extension capacity, poor infrastructure, and a skills deficit (SADC, 2012:11). In addition, climate change affects all countries in the region and in other regions of the world as well.

Agriculture's contribution to GDP and economic development recorded a strong growth of 9.6 per cent in 2014 compared to a contraction of 19.3 per cent in 2013. The substantial growth is attributable to increased livestock numbers reared in Namibia, particularly cattle, ostrich and pig, and the sufficient rainfall recorded in 2014 after the drought of 2013 (Namibia Statistics Agency, 2014:12).

It follows from the above narrative that there is lack of entrepreneurial-, business-and, other relevant technical skills. Moreover, supportive structures to enhance entrepreneurship and entrepreneurial performance in the agriculture sector of Namibia are also lacking. It is clear that the government's land reform as implemented through the NRP and AALS programmes does not create an environment in which the beneficiaries under these programmes can utilise the agricultural land allocated to them in a productive way, and which can ultimately contribute to both the improvement of their livelihoods and to the economic development of the country. Beneficiaries lack the abovementioned skills which would render them productive and economically sustainable farmers. This is a major shortcoming, which needs addressing.

The following section briefly reviews literature on certain constructs with a bearing on entrepreneurship and agriculture. It then presents the problem statement, the importance

of the study, research objectives, hypotheses, demarcation and scope of the study, methodology, and an outline of chapter two to seven.

1.3 LITERATURE REVIEW

1.3.1 Definition of key constructs

The following sub-sections briefly define the key concepts/constructs for this study. Detailed descriptions will be provided in the literature chapters.

1.3.1.1 Entrepreneurship

The definition of entrepreneurship has proven quite complex with various scholars and researchers expounding differing definitions and failing to reach consensus. Rosa (2013:37) supports this exposition by confirming that there is no single theory of entrepreneurship, but many competing theories borrowed from economics, psychology and sociology.

The following paragraphs present some perspectives on classical definitions of entrepreneurship, and more recent thoughts on how the phenomenon of entrepreneurship is perceived.

Even though Shane and Venkataraman (2000:218) argued that the lack of a coherent definition of entrepreneurship was holding back the development of the field, Shane (2012:18) posits that the field appears to have moved toward consensus around the core idea that entrepreneurship is a process dependent on both opportunities and individuals. There is also a convergence on a view of entrepreneurship in line with "emergence of new economic activity" (Wiklund, Davidsson, Audretsch & Karlsson, 2011:5). This view regards entrepreneurship as a force for creating a better socio-economic world (Wiklund *et al.* 2011:7).

Carlsson, Braunerhjelm, McKelvey, Olofsson, Persson and Ylinenpää (2013:914) also recognize that there are signs of convergence on some core issues, particularly creation and discovery of opportunities. Nevertheless, there are also signs of continued

specialization and fragmentation. The authors define entrepreneurship as an economic function that is carried out by individuals, entrepreneurs, acting independently or within organizations, to perceive and create new opportunities and to introduce their ideas into the market, under uncertainty, by making decisions about location, product design, resource use, institutions, and reward systems. Entrepreneurial activity and the entrepreneurial venture are influenced by the socioeconomic environment and result ultimately in economic growth and human welfare.

Ahmad and Seymour (2008:9) define entrepreneurs as:

"*Those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets.*"

They define entrepreneurial activity as:

"*the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets*";

and entrepreneurship as

"*the phenomenon associated with entrepreneurial activity.*"

According to Hisrich, Peters, and Shepherd (2013) entrepreneurship is the process of creating something new with value by devoting the necessary time and effort, assuming the accompanying financial, psychic, and social risks, and receiving the resulting rewards of monetary and personal satisfaction and independence.

For the purposes of this study, the definition of entrepreneurship by Ahmad and Seymor (2008:9) as stated above is adopted as, in its broader formulation, it better suits the objectives of the study.

Given that the purpose of this study is the development of a model for the enhancement of entrepreneurship in the agricultural sector, the next section will present brief insights on agriculture and its sustainability, by interrogating the concept of sustainability in the agricultural context.

1.3.1.2 Agriculture and Sustainability

Dale, Kline, Kaffka and Langeveld (2013:1112), take a landscape ecological perspective, and define agricultural sustainability as involving practices that are environmentally sound, economically profitable, and socially just. The authors suggest that agricultural sustainability must derive from the objectives of agriculture to provide food, fiber, and fuel supply for today's population without jeopardizing the capacity to provide the same services to future generations (Dale *et al.*, 2013:1113).

In conjunction with the perspectives offered by Dale *et al.* (2013) on agricultural sustainability, Gómez-Limón and Sanchez-Fernandez (2010:1062) point to the multidimensional character of the concept of sustainable development, which requires sustainability from the perspective of economics (profitable operation), social justice (fair and equitable distribution of the wealth it generates), and environmental friendliness (compatible with the maintenance of natural ecosystems). However, the authors caution that such a conceptualization of sustainability in the context of agriculture presents challenges in terms of analysing the future production of goods and services by agriculture, and the demands which agriculture needs to satisfy in order to be sustainable. Sustainability thus needs to be understood largely as a social construction which changes as a function of society and should be formulated taking into account geographical and temporal conditions (Gómez-Limón & Sanchez-Fernandez, 2010:1062).

In order to mitigate the threats to the ecosystem emanating from climate change, Nkambule and Dlamini (2012:4004) encourage the conservation of natural resources, prevention of land degradation and erosion, conservation of biodiversity and ecosystem, and smallholder irrigation. In the same spirit, Suman *et al.*, (2014:6) advocate for an integrated agricultural extension services system in which all stakeholders such as the government, non-governmental organizations (NGOs), private sector agencies, farmers' organizations, farmers' clubs, and workers participate actively in the planning of programmes. These actions could contribute to agricultural sustainability.

As stated above, this study defines agricultural entrepreneurship as the generation of value, through the creation or expansion of agricultural activity, by identifying and exploiting new products, processes and markets. Owing to the minimal research that has been conducted on agricultural entrepreneurs, a solid definition on the concept of

agricultural entrepreneurship has not emerged yet. The definition adopted in this study is informed by Ahmad and Seymour's (2008) definition of entrepreneurial activities.

The next sub-sections briefly define the constructs that have been identified in the literature review, with specific reference to chapter three. These highlight enabling instruments in entrepreneurial performance and the development of entrepreneurship.

1.3.1.3 Entrepreneurial orientation

Lumpkin and Dess (1996:136) have conducted seminal work on entrepreneurial orientation (EO), and describe and refer to EO as the processes and decision-making activities that lead to new entry. New entry is the central idea underlying the concept of entrepreneurship and it distinguishes entrepreneurial behaviour from other types of business activity that might be undertaken to capitalise on an opportunity (Lumpkin & Dess, 1996:162). The authors list and define the dimensions that characterise an EO as autonomy, innovativeness, risk-taking, pro-activeness, and competitive aggressiveness.

According to Lumpkin and Dess (1996:140-148):

- Autonomy refers to the independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion.

- Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes.

- Risk-taking behaviour typifies the incurring of heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace.

- Pro-activeness refers to how a firm relates to market opportunities in the process of new entry, by seizing initiative in order to meet demand.

- Competitive aggressiveness refers to a firm's propensity to challenge its competitors directly and intensely to achieve entry or improve position, and therefore outperform industry rivals in the marketplace. It is more about competing for demand.

Covin and Lumpkin (2011:857) understand EO to be a usually general or lasting direction of thought, inclination, or interest pertaining to entrepreneurship. The authors are of the opinion that even if the scholarly community has largely coalesced around the understanding of EO being a firm-level phenomenon, it does not suggest that it cannot exhibit a proclivity toward entrepreneurial thought and action. This is basically the context within which EO forms a central part of this study.

This study adopts the three-dimensional notions of EO, with innovation, pro-activeness and risk-taking as being dimensions introduced by Miller (1983).

The next section examines the supportive and cooperative structures in the construct of enabling environments briefly as structures for entrepreneurship development.

1.3.1.4 Enabling environment: cooperative and support structures

Nieuwenhuizen and Nieman (2014:12) state that in modern society the external environment should create a climate favourable to the entry of entrepreneurs. The creation of such an environment is often considered the responsibility of government as custodian of the laws and policies that govern economic activities in a country. Government, however, needs the involvement of other development organizations, tertiary institutions, civil society groups, and non-governmental organizations in the creation of such enabling environments. The work of Gnyawali and Fogel (1994) on entrepreneurial environments offers relevant insight in this regard and will be elaborated on in chapters two and three.

Carlsson *et al.* (2013:914) argue that entrepreneurial activities may be influenced by the socio-economic environment, consisting of institutions, norms, and culture including the availability of finance, knowledge creation in the surrounding society, economic and social policies, the presence of industry clusters, and geographic parameters.

The fostering of an enabling environment for entrepreneurship through the necessary support instruments such as government regulations that render support to start-up ventures, provision of financial and non-financial assistance, and improvement of entrepreneurial competencies, are necessary prerequisites for entrepreneurial performance.

The section that follows briefly examines the construct of entrepreneurial performance, as understood in the context of this study for its being a catalyst for entrepreneurial outcomes, including agricultural productivity, increased incomes, and improved livelihoods.

1.3.1.5 Entrepreneurial Performance

According to Lucky (2011:3) performance is a measurement or indicator to evaluate or access individuals, groups, firms and organizations. The author emphasizes the importance of distinguishing between entrepreneurial performance and firm performance. He argues that entrepreneurial performance refers to an individual (owner/entrepreneur) whereas firm performance refers to the organization or company, both of which combine into business performance.

This study entails measuring entrepreneurial performance as a catalyst for increased farm productivity and profitability, ultimately improving the livelihoods of farmers. Rauch, Wiklund, Lumpkin and Frese (2009:765) distinguish between financial and non-financial measures or indicators of performance, by listing factors such as sales growth and return on investment as financial measures. Non-financial measures include goals such as satisfaction and global success ratings made by owners or business managers. Lucky (2011:3) amplifies the above by referring to efficiency, growth, profit, size, liquidity, success/failure, market share and leverage as indicators of performance.

Antonites (2003:41) qualifies the role entrepreneurial training plays as an intervention in achieving the objectives or the desired increase in entrepreneurial performance, which are a vital part of the entrepreneurial process, successfully. The author, through his entrepreneurship-training model, posits that entrepreneurial performance is a function of performance motivation (M), entrepreneurial skills (E/S), and business skills (B/S). E/S is composed of risk propensity, creativity and innovation, opportunity identification, and role models. B/S constitutes general management skills, marketing skills, legal skills, operational skills, human resource management skills, communication skills, business plan, and financial skills.

Antonites (2003:41) further argues that the establishment of own business, completion of first transaction, growth in net value of business, recruitment of employees, increasing

productivity levels, and increasing profitability should result in entrepreneurial achievement. Given the challenges faced by small-scale farmers in computing financial measures of performance, the present study will focus on non-financial measures of performance, in line with Antonites (2003) and Lucky (2011).

The preceding sections introduced the background to global, regional and local agricultural perspectives. Developments and challenges in land reform in the study's geographical scope (Namibia), and the role of entrepreneurship in economic development were also introduced. They concluded by briefly covering literature on the constructs with a bearing on agricultural-entrepreneurial development.

In the context of the study's geographical scope, neither entrepreneurial competencies programmes for agriculture, nor mechanisms for assessing their impact on entrepreneurial performance and entrepreneurial outcomes exist.

The following section describes the problem statement for the study.

1.4   PROBLEM STATEMENT

The research problem for this study is the lack of developmental support models for agricultural entrepreneurship in the study's geographical scope (Namibia) in particular, and developing countries in general. The study aims to develop a model indicating which enabling environment dimensions lead to entrepreneurial performance in agriculture, and which entrepreneurial outcomes result from entrepreneurially oriented agricultural practices.

The model will be derived from existing scientific evidence in the field of entrepreneurship and encapsulated in an agricultural environmental context. Dimensions such as enabling environment (comprising supportive environment, entrepreneurial orientation, agricultural sustainability, and entrepreneurial competencies), entrepreneurial performance, and entrepreneurial outcomes will constitute the model. These constructs will form the basis for testing the model empirically. The model is termed as Agricultural-Entrepreneurial Development Model (AEDM).

Figure 1.1 presents the conceptual model on agricultural-entrepreneurial development as developed in chapter three. The conceptual model of agricultural-entrepreneurial development also contains an element of assessment (monitoring and evaluation) that would enable the assessment of its impact on the beneficiaries and the land reform programme in general. This is included for exploratory purposes only and will not form part of empirical testing in the structural model.

Figure 1.1: A conceptual model on agricultural-entrepreneurial development

Enabling Environments

Supportive Environment
-regulatory framework
-financial support
-non-financial support
-culture
-social capital (networking)
-market conditions
-role models
-education and training

Entrepreneurial Orientation
-technology and innovation
-risk taking
- pro-activeness

Entrepreneurial Competencies
-entrepreneurial skills
-business skills
-technical skills
-performance motivation
-mentorship

Agricultural Sustainability
-extension services
-climate change
-ecosystem, biodiversity, soil erosion

Entrepreneurial Performance
-growth in agricultural business
-increased competitiveness
-growth in agricultural start-ups

Entrepreneurial Outcomes
-agricultural productivity
-increased incomes
-improved livelihoods

Monitoring and Evaluating Entrepreneurial Performance

Note:
solid arrows ───────▶ signify a positive impact of the enabling constructs on entrepreneurial performance

thick solid arrow ━━━━▶ signifies the monitoring and evaluation of entrepreneurial performance

Cooper and Schindler (2008:70) define a model as a representation of a system that is constructed to study some aspect of the entire system. The AEDM is a representation of a system, which aims to enhance entrepreneurial performance in the agricultural sector and the achievement of certain crucial entrepreneurial outcomes in agriculture.

The following research questions are formulated for this study:

- Do the enabling environment dimensions of the supportive environment, entrepreneurial orientation, entrepreneurial competencies, and agricultural sustainability impact an entrepreneurial performance in agriculture positively?

- Does entrepreneurial performance result in improved livelihoods, increased incomes and agricultural productivity?

- Does the AEDM provide a useful basis for addressing the gap in theory and practice, as identified in this study?

Moreover, this study investigates direct causal relationships between the constructs of the model.

1.5   IMPORTANCE OF THE STUDY

As pointed out by Richards and Bulkley (2007:3) little scholarly and/or empirical research on the role of entrepreneurship in the agriculture sector, and/or entrepreneurial performance as catalyst for the improvement of the livelihoods of resettled and emerging farmers, has been conducted.

The study fills this gap by deriving a model, which promotes an entrepreneurial approach to agricultural development.

The study benefits research and practice mainly in two ways.

Firstly, it adds to the existing body of knowledge in the field of entrepreneurship, considering that minimal scholarly research on the role of entrepreneurship in agriculture has been done.

Secondly, the study enlightens policy makers about the potential critical role of entrepreneurship in agriculture; hence ensuring that policy makers formulate agriculture- and land reform policies that will lead to improved productivity in the agricultural sector, and the improved livelihoods of farmers.

1.6 RESEARCH OBJECTIVES

1.6.1 Primary Objective

The primary objective of the study is to develop a developmental model for agricultural entrepreneurship, which can, potentially enhance entrepreneurial performance in the agricultural sector and aid the achievement of certain crucial entrepreneurial outcomes in the agricultural sector.

1.6.2 Secondary Objectives

The following secondary objectives are addressed in the present study. These are:

- To develop a model that outlines a targeted support programme aimed at enhancing entrepreneurship and entrepreneurial performance in agriculture, clearly.

- To assess international best practice models as their contribution to the development of the model.

- To add to the existing body of knowledge in academia with respect to mainstream entrepreneurship, with a focus on agricultural entrepreneurs.

- To enlighten policy makers about the potential critical role of entrepreneurship in agriculture; thereby ensuring the formulation of agriculture-and land reform policies for improved productivity in agriculture and enhancing livelihoods of farmers.

- To create a developmental model that can be replicated in other countries in the Southern Africa region with similar socio-economic conditions and agricultural obstacles.

1.7 HYPOTHESES

In order to test the directional relationships between the constructs of the AEDM, as depicted in Figure 1.1, the following hypotheses are stated:

H_01: SE does not influence EP directly and positively.

H_a1: SE directly and positively influences EP.

H_02: CE does not directly and positively influence EP

H_a2: CE directly and positively influences EP

H_03: EO does not directly and positively influence EP.

H_a3: EO directly and positively influences EP.

H_04: EC do not directly and positively influence EP.

H_a4: EC directly and positively influence EP.

H_05: AS does not directly and positively influence EP.

H_a5: AS directly and positively influences EP.

H_06: EP does not directly and positively influence agricultural productivity.

H_a6: EP directly and positively influences agricultural productivity.

H_07: EP does not directly and positively influence increased incomes.

H_a7: EP directly and positively influences increased incomes.

H_08: EP does not directly and positively influence improved livelihoods.

H_a8: EP directly and positively influences improved livelihoods.

As stated in chapter five, and depicted in Figure 5.1, SE was re-operationalised into two components, namely, supportive environment (SE) and cooperative environment (CE). The re-operationalization was necessitated by the need to ensure improved item loadings on the indicators, and improved indicator contribution to respective

constructs (Schumacker & Lomax, 2010:205). The re-operationalization of constructs is covered in chapter six.

1.8   DEMARCATION AND SCOPE OF THE STUDY

The study derives a developmental model from existing models on entrepreneurship and agriculture. It would serve as a guide for the promotion of entrepreneurship and entrepreneurial performance in the agriculture sector of Namibia, as a means of improving the livelihoods of resettled and emerging farmers under the AALS and NRP programmes. The quantitative approach is used to collect data for empirical testing of the model.

As alluded to above, studies conducted on the implementation of the AALS and NRP programmes in the context of agricultural productivity and land reform, point to a dismal performance of these programmes. Beneficiaries did not perform to expectations and consequently it is necessary to review the implementation of these programmes. The study derives a model from existing models on entrepreneurship and agriculture, and addresses the weaknesses identified in the design and implementation of the above programmes. The model is validated empirically.

1.9   METHODOLOGY

1.9.1   Research Design

The study adopts a quantitative research approach as design. Structural Equation Modelling (SEM), specifically Partial Least Square SEM or PLS-SEM, represents the quantitative statistical method adopted for this study. Ullman and Bentler (2012:661) define SEM as a collection of statistical techniques that allow a set of relationships between one or more independent variables (IVs), be it continuous or discrete, and one or more dependent variables (DVs), also either continuous or discrete, to be examined. PLS-SEM is a causal modelling approach with the objective of maximising the explained variance of the dependent latent constructs (Hair, Ringle & Sarstedt, 2011:139). It is also efficient for theory building, theory testing, and

exploratory analysis, a prerequisite for theory building (Anderson & Gerbing, 1988:412; Fornell, 1983:445; Hair, Ringle & Sarstedt, 2012:312; Lowry & Gaskin, 2014:130-132).

The study consists of two elements – literature review and empirical research. Existing theory and models on entrepreneurship and agriculture were reviewed in order to establish the gap regarding agricultural entrepreneurship development. This is a formal model-based study premised on the problem statement and the accompanying research questions and research objectives.

The conceptual model was built based on extant literature in the fields of entrepreneurship and agriculture. Causal research approach (and not experimental research approach) was adopted to ascertain whether unidirectional causal relationships do, in fact, exist between the dependent variables (criterion variables) and independent variables, (predictor variables), and the direction of such relationships.

The dependent variables in this study are entrepreneurial performance, agricultural productivity, increased incomes and improved livelihoods. The independent variables include supportive environment, cooperative environment, entrepreneurial orientation, agricultural sustainability, and entrepreneurial competencies. As stated above, the construct SE was re-operationalised into two components, namely, supportive environment (SE) and cooperative environment (CE) as a way of ensuring improved item loadings on the indicators, and an enhanced indicator contribution to respective constructs. Hypotheses for this study are formulated in chapter five.

The target population is represented by farmers benefiting from both the AALS and NRP programmes. The focus is on livestock farming particularly cattle farming as it is the main agricultural production sector in Namibia (Hangara *et al.*, 2011:141).

The model is then tested by way of quantitative research approach using the PLS-SEM statistical technique. The survey method was used to collect data for testing the hypotheses set for the research problem by way of a structured questionnaire.

1.9.2   Sampling

The sample for this target population was drawn from the records of the Ministry of Lands and Resettlement for NRP farmers, and from the records of Agribank for AALS farmers. These two categories of farmers, targeted by the land reform programme, form the focus of this study. The qualifying criteria used for inclusion in both the NRP and AALS programmes include the following: an applicant must: (i) be a Namibian citizen, (ii) be at least eighteen (18) years of age, (iii) have no more than 150 large stock or 800 small stock, and (iv) not own any land, other than for residential purposes. Additionally, preference is given to applicants with background in agriculture (farming or education), women applicants, applicants who are generational farm workers (those who and whose parents have worked on farms for years), applicants from communal farming areas, and applicants with basic reading and writing skills (Ministry of Lands and Resettlement, 1998).

This study used non-probability sampling, specifically purposive sampling. There are two types of purposive sampling. They are judgement sampling and quota sampling. Judgement sampling, which was used in this study, requires that the respondent conform to some criterion, for instance, that the person concerned should be a NRP/AALS farmer (Cooper & Schindler, 2008:397-398). In the context of this study, the mere fact that only NRP/AALS farmers were approached as potential respondents, justifies the purposiveness of ensuring that the sample represented the population. Therefore, the results can be considered indicative of the whole population, in this way mitigating the restrictiveness of non-probability sampling in this respect.

1.9.3   Data Collection

The research instrument, used to gather data for this study, was a structured questionnaire. Items that could best describe the constructs were identified from the literature review and pooled to form a 5-point Likert type questionnaire. The questionnaire captures the constructs of the AEDM, namely, supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies,

agricultural sustainability, entrepreneurial performance, and entrepreneurial outcomes (agricultural productivity, increased incomes and improved livelihoods) which are regarded as by-products of entrepreneurial performance. A due process was followed to obtain the necessary authorisation for data collection. In this respect, permission was obtained to access databases of the Ministry of Lands and Resettlement in the case of NRP farmers, and Agribank for AALS farmers. This facilitated the granting of ethical clearance by the University of Pretoria for data collection. The questionnaire was administered on the selected sample by physical distribution. In the case of NRP farmers, who may not be able to complete a questionnaire on their own given their illiteracy, a trained enumerator assisted them.

In the context of this study, the construct's internal consistency was assessed by composite reliability, which unlike Cronbach's alpha, does not assume that all indicators are equally reliable. Convergent validity and discriminant validity were used to assess internal validity. Details on these methods are provided in chapter five.

1.9.4 Data Analysis

SEM is the adopted statistical approach for this study. It is asserted that it offers distinct advantages over first-generation statistical analysis techniques in that it is able to estimate a series of separate, but interdependent, multiple regression equations simultaneously, and can include latent constructs in causal models (Hair *et al.*, 2011:711; Lowry & Gaskin, 2014:125). Collected data were edited centrally in order to remove any errors and detect any omissions. They were statistically analysed (using descriptive statistical measures) to determine measures of locality, variability and relationship. Frequency tables were used to present descriptive data.

The study uses PLS-SEM to conduct inferential statistical analysis. This technique is the most suitable for exploratory analysis, theory building, theory testing, causal-predictive analysis, and for models with both reflective and formative latent constructs (Lowry & Gaskin, 2014:130-133, 141-142). The software employed is SmartPLS (Ringle, Wende & Becker, 2015)

1.10 OUTLINE OF THE CHAPTERS

The study is structured along seven chapters, each addressing the specific components of the study in detail.

Chapter 1: Introduction

This chapter provides an introduction to and an overview of the study.

Chapter 2: Entrepreneurship and agriculture

This chapter reviews literature pertaining to the field of entrepreneurship as a discipline in its own right, distinguishing it from other disciplines such as management and strategic management. It narrates the history of entrepreneurship and the challenges facing it as a field of study, research and practice, briefly. It then narrows the focus down to the concept of entrepreneurial performance by elaborating on the variables or constructs that enhance it. It also addresses agriculture and its sustainability.

Chapter 3: Conceptual frameworks and models on entrepreneurship and agriculture development

This chapter reviews literature with regard to entrepreneurial environments as catalysts for the pursuit of entrepreneurship in economic development in general, and the agriculture sector in particular. These environments are commonly and collectively termed "enabling environment" and require the joint effort of government and other development organizations, tertiary institutions, civil society groups, non-governmental organizations and the like. The chapter explores literature on supportive and cooperative environments in the context of the "Model for Entrepreneurship Development" depicted in Nieuwenhuizen and Nieman (2014:11) and the Entrepreneurship Training Model by Antonites (2003:41). Other models on entrepreneurship development such as the "Integrative Model of Entrepreneurial Environments" by Gnyawali and Fogel (1994:56) and models on agricultural development are also explored. This lays the foundation for the conceptual AEDM,

which is then transformed into a statistical model in chapter four. Propositions for each construct of the model are stated.

Chapter 4: A measurement framework of agricultural-entrepreneurial development

This chapter delves into the transformation of the conceptual model into a statistical model for empirical testing. It provides the theory to the development of the statistical model through literature review on measurement instruments for the identified constructs of the AEDM, namely: supportive environment; cooperative environment; entrepreneurial orientation; agricultural sustainability; entrepreneurial competencies; entrepreneurial performance; and entrepreneurial outcomes (agricultural productivity, increased incomes and improved livelihoods).

Chapter 5: Research methodology

This chapter outlines the research methodology followed in addressing the research problem identified for this study. It highlights the research problem, research questions, and the objectives guiding the research. It presents the hypotheses for the study, the research design, the sampling methods, the data collection techniques employed, the approaches for assessing the validity and reliability of the constructs, and for the statistical technique employed, in this case the PLS-SEM.

Chapter 6: Data analysis and findings

This chapter reports the empirical results by way of an in-depth analysis of the data. After describing the profile of respondents by way of descriptive statistics, it presents the empirical results of data analyses obtained through PLS-SEM. It discusses the findings and their implications in terms of the problem statement, research questions, research objectives and hypothesis testing.

Chapter 7: Summary, conclusion and recommendations

This chapter contains a summary of the findings, conclusions and recommendations for future research and for practice. It highlights the contributions of the study. It also

situates the findings of the study within the literature covering the relationships investigated. Limitations of the present study are acknowledged in this chapter.

CHAPTER 2
ENTREPRENEURSHIP AND AGRICULTURE

2.1 INTRODUCTION

This study is embedded in the phenomenon of land reform in Namibia and the need for reinvigorating the instruments for its effective and efficient implementation. Chapter one narrated the challenges of land reform in Namibia as evidenced by studies (Werner & Odendaal, 2010; Ministry of Lands and Resettlement, 2010) undertaken to assess its impact on the livelihood of beneficiaries, particularly the NRP and AALS farmers.

Chapter one also highlighted the importance of agriculture as a vital development tool for achieving the United Nations Millennium Development Goals; as key to employment, growth and poverty reduction in Africa; as a livelihood; and as provider of environmental services, making it a unique instrument for development. Notwithstanding the importance attached to it, the agricultural sector has long been neglected in terms of policy focus and resource allocation. In Sub-Saharan Africa, only 4 per cent of total government spending goes to farming (Bach & Pinstrup-Andersen, 2008:2).

Various scholars (Kelley *et al.* 2010; Richards & Bulkley, 2007;Valliere & Peterson, 2009) point to the critical role that entrepreneurship can play in bringing greater efficiency to agriculture, extraction and other industries. These authors regard entrepreneurs as drivers and shapers of innovation, thereby speeding up structural changes in the economy. Yet little scholarly research has been conducted on agricultural entrepreneurs. In light of the relevance of agriculture and entrepreneurship for developing economies such as Namibia, the frame of research for this study is entrepreneurship in the agriculture sector of Namibia.

In an effort to develop the theoretical framework for this study, this chapter reviews literature relating to entrepreneurship and agriculture, particularly those factors which influence entrepreneurial performance.

2.2   ENTREPRENEURSHIP

In the sub-section which follows, a historical perspective of entrepreneurship will be presented.

2.2.1   Historical perspective and definition of entrepreneurship

Cunningham and Lischeron (1991:45) state that the term "entrepreneur" derives from the French verb "entreprendre" meaning to "undertake" and was translated from the German verb "unternehmen" which also mean "to undertake". The authors point out that in the early sixteenth century, entrepreneurs were thought of as Frenchmen who undertook to lead military expeditions. De Farcy and Berthold (in Cunningham & Lischeron, 1991:50) state that French economists also used the word to describe people who bore risk and uncertainty in order to make innovations. This is in line with Cantillion (1755) who is quoted as follows: "The entrepreneur buys at a certain price and sells at an uncertain price" (Antonites, 2003:27). Cantillon was the first to offer a clear conception of the entrepreneurial function as a whole (Filion, 1997:3).

Filion (1997:3) highlights the fact that not only did entrepreneurship originate from the science of economics alone as is popular belief, but that the readings of both Cantillon (1755) and Say (1803; 1815; 1816; 1839) reveal that they were also interested in the managerial aspects of enterprises, business development and business management.

Jean-Baptiste Say was the second author to take an interest in entrepreneurs, (Filion, 1997:3). According to this author, Say viewed entrepreneurs as agents of change and became the first to define the boundaries of what an entrepreneur, in the modern sense of the term, actually is. However, it was Schumpeter who really launched the field of entrepreneurship, by associating it clearly with innovation (Filion, 1997:3). Schumpeter (in Filion, 1997:3) states the following in relation to entrepreneurship:

> *"The essence of entrepreneurship lies in the perception and exploitation of new opportunities in the realm of business…it always has to do with bringing about a different use of national resources in that they are withdrawn from their traditional employ and subjected to new combinations".*

Accentuating Filion (1997), Lumpkin and Dess (1996:142) state that Schumpeter was among the first to emphasize the role of innovation in the entrepreneurial process. According to these authors, Schumpeter outlined an economic process of "creative destruction", which essentially means that wealth was created when existing market structures were disrupted by the introduction of new goods or services that shifted resources away from existing firms and caused new firms to grow (Lumpkin & Dess, 1996:142). It follows from the above quotation that in Schumpeter's view, entrepreneurs are not just innovators, but are also important agents of economic development. Knight (in Filion, 1997:4) showed that because of the state of uncertainty in which entrepreneurs worked, they assumed a risk and were rewarded accordingly by the profits they made from such activities.

Filion (1997:4) posits that although entrepreneurs are mentioned in economics, they however, appear scarcely – and sometimes not at all – in the classical models of economic development. Filion (1997:4) further argues that the refusal by economists to accept non-quantifiable models led the world of entrepreneurship to turn to the behaviourists for more in-depth knowledge of the entrepreneur's behaviour.

Consequently, a number of writers in behavioural science sprung to the fore to fill the void left by economists' approach to entrepreneurship. One of the first authors from this group to show an interest in entrepreneurs was Max Weber who identified the value system as a fundamental element in explaining entrepreneurial behaviour and viewed entrepreneurs as innovators, independent people whose role as business leaders conveyed a source of formal authority (Filion, 1997:5). However, McClelland (in Filion, 1997:5) who is regarded as having really launched the contribution of the behavioural science to entrepreneurship defines entrepreneurs as follows:

> *"An entrepreneur is someone who exercises control over production that is not just for his personal consumption. According to my definition, for example, an executive in a steel-producing unit in the USSR is an entrepreneur".*

Cunningham and Lischeron (1991:46) identified and analysed six schools of thought on entrepreneurship. These are: Great Person School, Psychological School, Classical School, Management School, Leadership School and Intrapreneurship School, as depicted in Table 2.1 below.

Table 2.1: Summary of approaches for describing entrepreneurship

Entrepreneurial Model	Central Focus or Purpose	Assumption	Behaviours and skills	Situation
"Great Person" School	The entrepreneur has an intuitive ability – a sixth sense – and traits and instincts he/she is born with	Without this "inborn" intuition, the individual would be like the rest of us mortals who "lack what it takes"	Intuition, vigour, energy, persistence, and self-esteem	Start-up
Psychological Characteristics School	Entrepreneurs have unique values, attitudes, and needs which drive them.	People behave in accordance with their values, behaviour results from attempts to satisfy needs.	Personal values, risk taking, need for achievement, and similar traits.	Start-up
Classical School	The central characteristic of entrepreneurial behaviour is innovation	The critical aspect of entrepreneurship is in the process of doing rather than owing	Innovation, creativity, and discovery.	Start-up and early growth
Management School	Entrepreneurs are organizers of an economic venture; they are people who organize, own, manage, and assume the risk	Entrepreneurs can be developed or trained in the technical functions of management.	Production planning, people organizing, capitalization, and budgeting.	Early growth and maturity
Leadership School	Entrepreneurs are leaders of people; they have the ability to adapt their style to the needs of people	An entrepreneur cannot accomplish his/her goals alone, but depends on others	Motivation, directing, and leading.	Early growth and maturity
Intrapreneurship School	Entrepreneurial skills can be useful in complex organizations; intrapreneurship is the development of independent units to create, market, and expand services	Organizations need to adapt to survive; entrepreneurial activity leads to organizational building and entrepreneurs becoming managers.	Alertness to opportunities, maximizing decisions.	Maturity and change.

<u>Source</u>: Adapted from Cunningham and Lischeron (1997:47).

According to this table, entrepreneurs are characterised in various forms:(i)"great person" with inborn traits and instincts; (ii)"psychological" traits exhibiting unique values, inclination to risk-taking and need for achievement; (iii)"classical" traits on innovation, creativity and

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discovery; (iv)"management" characteristics of organising, production planning, capitalisation and budgeting; (v)"leadership" traits of motivating, directing and leading people; and finally; (vi) the "intrapreneurship" trait of instilling a culture of entrepreneurship in organizations to create new markets, products and processes.

The various schools of thought provide different insights for recognising underlying values, responding to the future, improving management, and changing and adapting. It may therefore not be advisable to obtain the knowledge of entrepreneurs by focusing solely on the criteria of one school of thought. It all depends on the research agenda one is pursuing (Cunningham & Lischeron, 1991:58). They all provide useful insights which can be drawn upon in advancing the concept of entrepreneurship and entrepreneurs.

Gartner (1988:12) argues that focusing on the traits and personality characteristics of entrepreneurs will neither lead to the definition of the entrepreneur nor will it help the understanding of the phenomenon of entrepreneurship. The author urges scholars and researchers when studying entrepreneurs and entrepreneurship to rather adopt a behavioural approach which regards entrepreneurs as a set of activities involved in organization creation, as opposed to the trait approach which treats entrepreneurs as a set of personality traits and characteristics (Gartner, 1988:11). The focus should be on what entrepreneurs do and not who they are. An entrepreneur is not static. On the contrary, he\she is dynamic. Therefore, entrepreneurship should be looked at as the role that individuals play in the creation of organizations (Gartner, 1988:28).

Bygrave and Hofer (1991:13) opine that entrepreneurship lacks a substantial theoretical foundation, thus presenting a challenge to entrepreneurship researchers to develop models and theories anchored on solid foundations from the social sciences. The authors emphasise the importance of good definitions as a necessary condition for the operationalization of concepts and, in the absence of a universally accepted definition, the need for every researcher to clearly state what is meant when the term entrepreneurship is used (Bygrave & Hofer, 1991:13).

In an effort to shift focus away from the characteristics and functions of the entrepreneur, in line with what Gatner (1988) posits, Bygrave and Hofer (1991:14) suggest rather focusing on the nature and characteristics of the entrepreneurial process. The authors define the entrepreneurial process as all the functions, activities, and actions that relate to the identification of opportunities and creation of organizations to exploit them. Therefore,

an entrepreneur would be someone who perceives opportunities and creates an organization to pursue those opportunities (Bygrave & Hofer, 1991:14).

Furthermore, the authors perceive an ideal model of entrepreneurship as one which is rooted in the social sciences, such as anthropology, psychology, sociology, economics, and politics, given that these are the sciences that describe the key variables that underlie the process of venture creation (Bygrave & Hofer, 1991:17).

The process-oriented view progressively replaced the trait-based view in the last few decades. Accordingly, a number of authors have defined entrepreneurship based on what entrepreneurs do. Lumpkin and Dess (1996:136), for instance, regard new entry as the central idea underlying the concept of entrepreneurship. The authors explain that new entry can be accomplished by entering new or established markets with new or existing goods and services.

Shane and Venkataraman (2000:218) define the field of entrepreneurship as the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited. In contrast to Gartner (1988) who defines entrepreneurship as the creation of organizations, Shane and Venkataraman (2000:219) argue that entrepreneurship does not require, but can include, the creation of new organizations.

Ahmad and Seymour (2008:9) define entrepreneurs as those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets. They define entrepreneurial activity as the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets; and entrepreneurship as the phenomenon associated with entrepreneurial activity. From this view on entrepreneurship, it appears that implicit in creation or expansion of economic activity is the notion of growth, sustainability and profiteering as distinguishing characteristics of entrepreneurship from normal business activity.

As is evident from the above, early research on entrepreneurship focused on the personal characteristics of individual entrepreneurs and firms, including their successes or failure. The characterisation of entrepreneurs in various forms or schools of thought as expounded

by Cunningham and Lischeron (1991) is a clear example of the trait approach to entrepreneurship. However, recent trends in entrepreneurship research shift the focus from the characteristics and behaviour of the entrepreneur to the function of entrepreneurship. Entrepreneurial process, opportunity, and the nature of organizational interaction are core topics in entrepreneurship research (Carlsson *et al.*, 2013:915).

Meyer, Libaers, Thijs, Grant, Glänzel and Debackere (2014:473, 475) confirm that entrepreneurship has grown steadily during the 1990s and has truly emerged as a legitimate academic discipline in the latter part of the 2000s. Whilst in the early 1990s fewer than 100 papers were published, this figure exceeded 5,000 published papers by 2010. In support, Busenitz, Plummer, Klotz, Shahzad and Rhoads (2014:9-10) contend that the decade of the 2000s witnessed a substantial increase in the relative frequency of publication of entrepreneurship articles in the major management journals, suggesting that entrepreneurship has reached another level of legitimacy as an academic field of inquiry. These authors further argue that entrepreneurship research is an exporter of intellectual contributions to the broader community of scholars in the areas of opportunities and the emergence of new ventures, which areas represent a unique domain of organizational birth and development.

In the section which follows a contemporary perspective on entrepreneurship will be presented.

2.2.2 Contemporary perspectives on entrepreneurship

There has been a paradigm shift in how scholars and researchers view the field of entrepreneurship. There has been a move away from looking at entrepreneurship from the two lenses of the trait and behavioural approaches *per se* to viewing this phenomenon in line with "emergence of new economic activity" (Wiklund, Davidson, Audretsch & Karlsson, 2011:5). Shane (2012:18) complements the above exposition by recognising that the field appears to have moved toward consensus around the core idea that entrepreneurship is a process that depends on both opportunities and individuals.

Recent studies by Griffiths, Kickul, Bacq and Terjesen (2012); Wiklund *et al.* (2011); Shepherd and Patzelt (2011); Sarasvathy and Venkataraman (2011); and McMullen

(2011) suggest a paradigm shift in the definition of, and approach to, entrepreneurship. Griffiths *et al.* (2012) advocates for multilevel analyses and multidisciplinary approaches of entrepreneurship away from a single-lens approach as is the case in the behavioural approach. The authors stress the importance of a contextualised view of entrepreneurship in terms of what Welter (2011:167) refers to as circumstances, conditions, situations, or environments that are external to the respective phenomenon and enable or constrain it.

In contrast to the above exposition, Wiklund *et al.* (2011:5) strongly recommend that entrepreneurship research be unified as a field approached theoretically and empirically in terms of the phenomenon. The authors posit that defining entrepreneurship instead as a phenomenon that transcends context has potential of allowing entrepreneurship scholars to address issues that really matter and make important contributions to scholarship but also to making the world a better place. In line with this view, the works of Shepherd and Patzelt (2011), Sarasvathy and Venkataraman (2011), and McMullen (2011) all emphasise that entrepreneurship is a platform for creating a better socio-economic world.

McMullen (2011:186) adds to the argument by offering an economic theory of social entrepreneurship that focuses on entrepreneurial activity occurring at the nexus of the three scholarly domains of business entrepreneurship, social entrepreneurship, and institutional entrepreneurship (Figure 2.1 below).

Figure 2.1: Development entrepreneurship as Nexus of Social entrepreneurship, Business entrepreneurship, and Institutional entrepreneurship
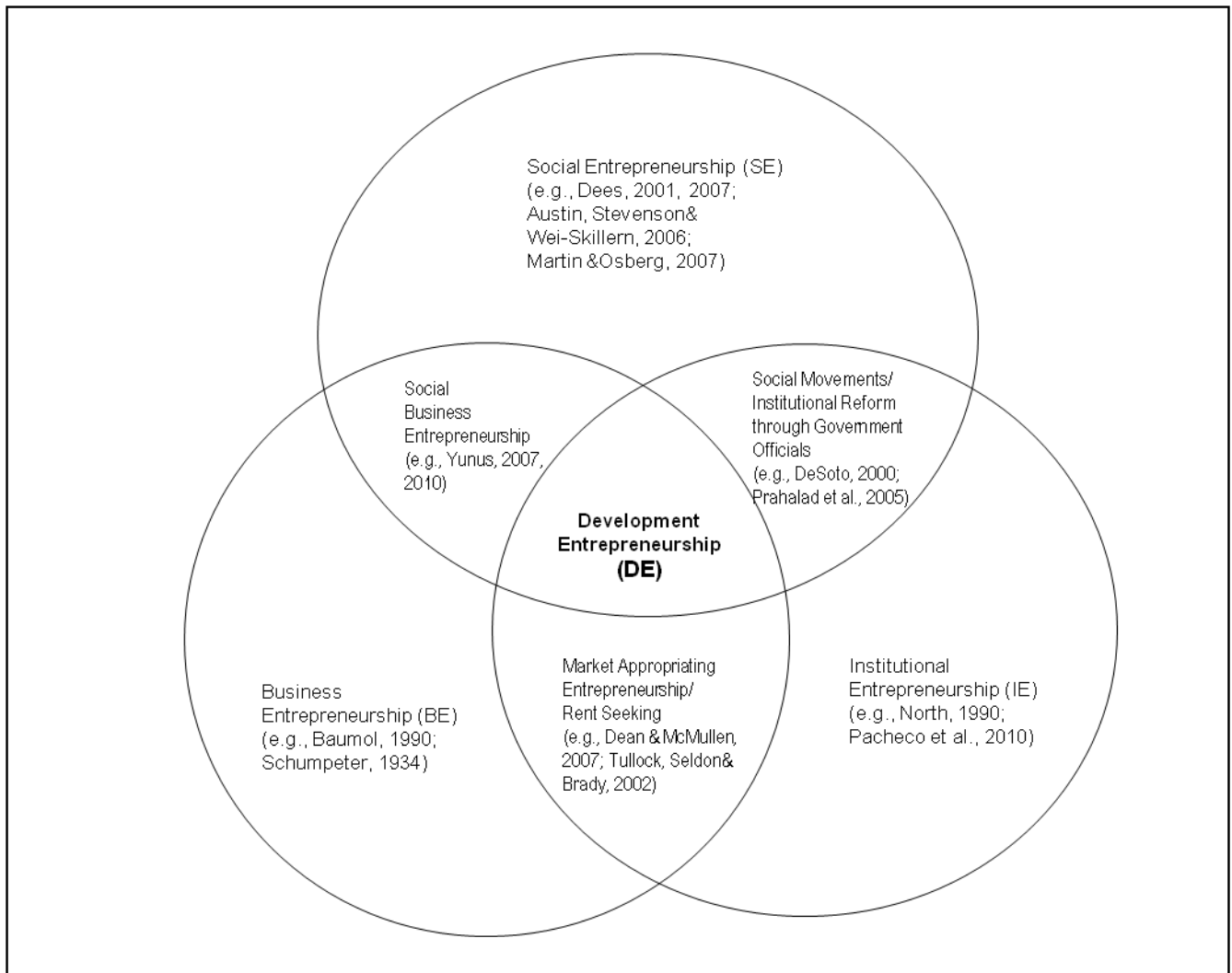
Source: Adapted from McMullen (2011:187).

The author refers to the construct as development entrepreneurship (DE), and it seeks to accelerate the institutional change (transformation of institutional environments) necessary to make economic growth more inclusive.

Sarasvathy and Venkataraman (2011:125) are of the view that entrepreneurship is a method, a meta-logic or procedural rationality that can help a coherent and pragmatic rethinking and reformulation of the categories that matter to human and societal progress. The authors concede that entrepreneurship should be taught not only to entrepreneurs but to everyone, as a necessary and useful skill, and an important way of reasoning about the world (Sarasvathy and Venkataraman, 2011:113).

Shepherd and Patzelt (2011:142) view entrepreneurship from a sustainable development perspective. The authors define sustainable entrepreneurship as being focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society. As this study is about developing a development model to enhance entrepreneurship in the agriculture sector of Namibia, sustainable entrepreneurship could play an important role towards this goal. Shepherd and Patzelt (2011:143), therefore, maintain that entrepreneurship research that focuses exclusively on the economic outcomes of entrepreneurial action (individuals, firms, and/or society) do not simultaneously consider sustainability outcomes, and thus cannot be considered sustainable entrepreneurship.

More recent literature on sustainable entrepreneurship emphasizes the need for entrepreneurs to be politically active through collectivism in order to overcome market access barriers. Pinkse and Groot (2015) posit that sustainable entrepreneurship as fostered by entrepreneurs who develop new technologies and business models, and therefore contribute to resolving environmental degradation and increasing the quality of life of consumers, is nonetheless, hampered by market barriers. These include imperfect information about the market; government intervention; monopoly power and unfair pricing methods by established firms (Pinkse & Groot, 2015:633-635). The authors suggest that sustainable entrepreneurs can try to circumvent such barriers by becoming politically active in the sense of lobbying and influencing policy makers towards their cause. They can do so by directly supplying policy makers with relevant information, using social media, and by soliciting assistance from experts and journalists to carry their message over to policy makers. Sustainable entrepreneurs could also try to gain political access and influence by demonstrating that they have the knowledge and expertise of novel ways of conducting business in a manner that is less damaging to the environment (Pinkse & Groot, 2015:648).

Frese, Rousseau and Wiklund (2014) promote the idea of evidenced-based entrepreneurship (EBE) which essentially pursues a science-informed practice of entrepreneurship. This approach builds on insights from the practice of evidence-based management, which in turn draws on evidenced-based approaches in medicine and criminology. A prerequisite for EBE is that there should be systematic accumulation and

interpretation of the body of evidence from entrepreneurship scholarship (Frese *et al.*, 2014:209). Unlike medicine or management, where standards based on the best available evidence are already established, this is not the case with entrepreneurship which is fairly new and also deals with generating novelty. The authors recommend utilisation of randomized controlled experiments that can generate high-quality evidence of what works to promote effective entrepreneurial practice as in medicine. In such experiments, the group receiving the intervention is exactly comparable to the control group. EBE holds benefits for the following constituents: education and trainers in entrepreneurship programmes; policy makers in entrepreneurship; consultants to entrepreneurial firms; providers of capital for new ventures; and practitioners eager to expand their knowledge and expertise (Frese *et al.*, 2014:210,213).

Following on from the above, the section below provides an overview of the literature on the role which entrepreneurship plays in economic development.

2.3 ENTREPRENEURSHIP AND ECONOMIC DEVELOPMENT

Various scholars and researchers (Lumpkin & Dess, 1996; Manev, 2010; Mojica, 2010; Salgado-Banda, 2007; and Tang & Koveos, 2004) have pointed to the critical role that entrepreneurship plays in economic development. Lumpkin and Dess (1996:135) assert that entrepreneurial activity represents one of the major engines of economic growth and today accounts for the majority of new business development and job creation in the United States. Tang and Koveos (2004:161) highlight the significance economists, such as Schumpeter, have for many years, focused on the relevance of entrepreneurial activity for economic growth. Quoting Leibenstein (1968:74) who asserts that,…"in the presence of market imperfections, entrepreneurs are needed to search, discover, and evaluate opportunities, marshal the financial resources necessary for the enterprise", Tang and Koveos (2004:161) caution that in order to appreciate the richness of the impact of entrepreneurial activities on economic growth and development, there is a need for entrepreneurs and policy makers to fully explore the relationship between different entrepreneurial activities and economic performance over the course of a complete business cycle. Entrepreneurship is widely credited with playing a crucial role in economic growth (Salgado-Banda, 2007:3). Using patent data as a proxy for productive

entrepreneurship to examine the impact of entrepreneurship on economic growth, Salgado-Banda (2007:23) concludes that entrepreneurship has a positive impact on economic growth.

Recent studies (Manev, 2010; Mojica, 2010; Koveos, 2011; Rehn, Brännback, Carsrud and Lindahl, 2013) continue to emphasise this role. Mojica (2010:3) asserts that entrepreneurship is now recognised as a strategy to achieve economic growth in many regions. The author points to increasing uncertainty in the world economy, globalisation, increased marketing integration and new technologies as factors, that have spurred on entrepreneurship as a vehicle for creating economic growth through the establishment of new firms or growth of established firms. An understanding of entrepreneurship is fundamental in comprehending how it impacts positively on economic growth and development, and furthermore, how entrepreneurial capacity can be expanded to increase the chance of achieving economic development (Mojica, 2010:4). Using the simultaneous equation model in assessing entrepreneurship and economic development, the author confirms that entrepreneurial activity has a positive effect on economic growth.

Manev (2010:69) argues that, as elsewhere around the world, entrepreneurship in transitional economies is a major engine of growth and innovation. The author regards entrepreneurship in these economies as both a product and a driver of the transition process. Entrepreneurial ventures add value to the economic growth and market transformation of transitional economies by offsetting job losses in the state-owned sector, turning technological and market innovations into economic output, providing a constant source of organizational change and renewal, and continuously affirming the role of market-based economic change (Manev, 2010:71).

Revisiting the relationship between economic development and entrepreneurship, Schramm (2010) asserts that the entrepreneurial model has been proven to play a critical role in both economic recovery and alleviating social pressures. The author advocates that there should be continuous education of public officials and other decision makers on the power and importance of entrepreneurship.

Rehn *et al.* (2013:548) add to the above by recognising entrepreneurship in both economics and business studies, as a critically important field for both economic development and growth. The authors contemplate that the mere recognition and respect accorded to professors of entrepreneurship at high-profile conferences, and considerable

funding and support for research and studies in entrepreneurship, all stem from the contemporary view that the development of new ventures is critically important and potentially very lucrative (Rehn *et al*., 2013:548). Entrepreneurship education programmes have a vital role to play in orienting students towards careers as entrepreneurs. The enabling environment, specifically the cooperative environment, can have a major impact on educational institutions incorporating entrepreneurship courses in their curricula.

The next section reviews literature on enabling environment, including cooperative and supportive structures.

2.4   ENABLING ENVIRONMENT: COOPERATIVE AND SUPPORT STRUCTURES

According to Kiggundu (2002:239, 245) the external environment comprises various macroeconomic and socio-cultural variables such as: competitiveness, deregulation, legal framework, property rights, social capital, risk-taking, services to the public, and infrastructure as necessary but not sufficient for sustaining changes in entrepreneurial competencies and firm performance.

This author states that the concept of entrepreneurial competencies includes the entrepreneur's requisite attributes such as: attitudes, values, beliefs, knowledge, skills, abilities, personality, wisdom, expertise (social, technical, managerial), mindset, and behavioural tendencies as indispensable for successful and sustained entrepreneurship. The author further considers education, training, experience, apprenticeship, overseas visits and other human capital development as being relevant for entrepreneurial success or failure to the extent that they contribute to developing entrepreneurial competencies (Kiggundu, 2002:244). Carlsson *et al.* (2013:914) state that the socio-economic environment, consisting of institutions, norms, and culture as well as availability of finance, knowledge creation in the surrounding society, economic and social policies, the presence of industry clusters, and geographic parameters may influence entrepreneurial activities.

For the purposes of this study, an enabling environment may be regarded as consisting of factors in the external and internal environment with a bearing on entrepreneurial performance, such as: supportive and cooperative structures; entrepreneurial orientation;

entrepreneurial competencies; and agricultural sustainability. These factors or constructs are further elaborated on as part of the conceptual model in chapter three.

Tilley (2007:1) notes that many recent land reform programmes (more specifically, those under the market-based approach which came to the fore internationally during the 1990s) have tended to focus more on land acquisition and less on the requisite settlement support that accompanies it. The author further highlights that most land reforms have implied a key role for the state, but in the 21st century under neo-liberalism and market-based approach to land reform, the state is no longer viewed as a central player of settlement support. Although the process of providing settlement support is a layered and complex one and has few local precedents to guide it, one cannot simply give land to the land-poor and then abandon them and expect the private sector to respond and provide for their needs (Tilley, 2007:42).

Recognising the absence of an integrated framework for studying the environmental conditions conducive for entrepreneurship development, and the fact that explicit links have not been established between the needs of entrepreneurs and how environments can fulfil entrepreneurs' needs, induce or reinforce their desire to go into business, and thus facilitate the process of new venture creation, Gnyawali and Fogel (1994:43) developed such a framework consisting of five dimensions of entrepreneurial environments and linked these dimensions to the core elements of the new venture creation process.

Gnyawali and Fogel (1994:44) refer to entrepreneurial environments as a combination of factors that play a role in the development of entrepreneurship. Firstly, it refers to the overall economic, socio-cultural, and political factors that influence people's willingness and ability to undertake entrepreneurial activities. Secondly, it refers to the availability of assistance and support services that facilitate the start-up process (Gnyawali & Fogel, 1994:44). The authors' Integrative Model of Entrepreneurial Environments, comprises the following elements: government policies and regulations; socio-economic factors; financial assistance; non-financial assistance; entrepreneurial and business skills; opportunity; ability to enterprise; propensity to enterprise; and likelihood to enterprise. This model will be elaborated on in chapter three which will review literature on models of entrepreneurship development.

Minniti (2008:779), whilst acknowledging entrepreneurship as an important engine of growth, also recognises that government policy, in turn, shapes the institutional environment in which entrepreneurial decisions are made. Government policies mould institutional structures for entrepreneurial action, encouraging some activities and discouraging others (Minniti, 2008:781). The author argues that government should, therefore, endeavour to create an enabling environment conducive to the division of labour, the commercialization of invention, and exchange, as too much public involvement, without co-interest from the private sector, can hinder rather than help entrepreneurs by creating possible market distortions.

Nieuwenhuizen and Nieman (2014:12) add to the above by urging the external environment to create a climate favourable to the entry of entrepreneurs. The creation of such an environment is often considered the responsibility of government since it is the custodian of the laws and policies that govern economic activities in a country. The government will, however, need the involvement of other development organizations, tertiary institutions, civil society groups, non-governmental organizations in the creation of such enabling environments.

Sobel (2008:642) finds that better institutional structures produce higher venture capital investments per capita, a higher rate of patents per capita, a faster rate of sole proprietorship growth, and a higher establishment birth rate. The author further contends that in areas with institutions providing secure property rights, a fair and balanced judicial system, contract enforcement, and effective limits on government's ability to transfer wealth through taxation and regulation, creative individuals are more likely to engage in productive market entrepreneurship – activities that create wealth (e.g. product innovation). However, Sobel (2008:645) reports that many governments' programmes aimed at subsidising entrepreneurial inputs such as government loan and education programmes have shown little success in actually promoting entrepreneurship.

Utilising the Global Entrepreneurship Monitor (GEM) data to study entrepreneurship development in Russia, Aidis, Estrin and Mickiewicz (2008:656) discovered that the country's weak institutional environment explains its relatively low levels of entrepreneurship development, where the latter is measured in terms of both number of start-ups and of existing business owners. The authors also point out that, in the Soviet period, entrepreneurs were regarded as "speculators" and often deemed criminals who

were just interested in making a profit. Consequently, a punishment-oriented "inspection culture" was allowed to develop, where discretionary power of officials led to corruption. In an environment where the benefits and rewards for rent-seeking activities outweigh their costs, unproductive entrepreneurship such as entrepreneurship that benefits the entrepreneur and not the economy will flourish (Aidis *et al.*, 2008:658).

Entrepreneurial firms in an environment like Russia's face rapid shifts in the institutional environment (Ahlstrom & Bruton, 2010:531). Thus the environment for entrepreneurial ventures through the end of the 20th century was difficult as they faced high levels of corruption and taxes, interference from the government and other powerful figures, while having difficulty raising legitimate capital (Ahlstrom & Bruton, 2010:535). These authors, however, acknowledge that with the evolution of legitimacy of entrepreneurial ventures in Russia, legal institutions, as represented by the laws and regulations passed by the government, have also evolved to become more supportive.

On the African front, Kiggundu (2002:250) states that taxation, security of property rights, and the regulation of trade and other commercial activities are more restrictive in Africa than other globalizing regions. Kshetri (2011:24) lists the following factors as barriers hindering the development of entrepreneurship in Africa: corruption; the quality of the rule of law; and the effectiveness of the national legal system in enforcing contracts.

However, the World Bank (2015:1) acknowledges that business regulatory practices have been slowly converging as economies with initially poor performance narrow the gap with better performers. Sub-Saharan Africa accounts for 5 of the 10 top improvers in 2013/14 in ease of doing business. The region also accounts for the largest number of regulatory reforms, with 70 per cent of its economies having carried out at least one such reform. Namibia ranks fifth behind Botswana, Mauritius, The Seychelles and South Africa, on the ease of doing business in the SADC region (World Bank, 2015:4).

 In a study on the development of entrepreneurship and private enterprise in the People's Republic of China, He (2009:45) informs that the 1982 CCP's (Chinese Communist Party) Plenum adopted policies aimed at hindering the development of private businesses to "cut the capitalist tails in all sectors of the economy". Nonetheless, in 2007, the People's Congress passed a landmark law recognizing private property rights (He, 2009:45). The author advises that Government policies should focus on increasing systematic transparency and accountability, and improving the legal environment to eliminate

regulatory loopholes, protect property rights, lower entry and exit (bankruptcy law) barriers, and finally, to reduce uncertainties and ambiguities in the system (He, 2009:56).

Investigating the relationship between institutional elements of the social environment and entrepreneurial cognitions, Lim, Morse, Mitchell and Seawright (2010:509) find that institutional context significantly influences the venture creation decision through cognitive scripts. The authors hold the view that government has an important role to play in developing an entrepreneurially munificent institutional environment for venture creation by putting in place a legal system which strongly protects property rights, a less complex regulatory framework, and providing an easier access to debt financing through the banking system, given that many aspects of a business system are determined by government policy (Lim *et al.*, 2010:509).

Edelman and Yli-Renko (2010:850) propose that, complementary to current policy initiatives which focus on providing resources for entrepreneurs and easing structural environmental constraints, perception of opportunities should be encouraged through increased emphasis on creativity and problem-solving skills in entrepreneurship education. By shifting the nature of entrepreneurship education and programmes, nascent entrepreneurs of the future could be better prepared to integrate their different roles as cognitive agents interpreting their environments, resource mobilizers attempting to gain access to external resources, and "bricoleurs" making do with whatever resources are at hand (Edelman & Yli-Renko, 2010:850). This can be a vitally important element in entrepreneurial orientation of potential and nascent entrepreneurs.

The following section reviews literature on entrepreneurial orientation and its contribution to performance in an entrepreneurial context.

2.5   ENTREPRENEURIAL ORIENTATION

According to Lumpkin and Dess (1996:136,162), entrepreneurial orientation (EO) refers to the processes and decision-making activities that lead to new entry. New entry is the central idea underlying the concept of entrepreneurship which distinguishes entrepreneurial behaviour from other types of business activity that might be undertaken to capitalise on an opportunity. The authors list the following as dimensions that characterise

an EO, and define them respectively: autonomy, innovativeness, risk-taking, pro-activeness, and competitive aggressiveness.

Autonomy refers to the independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion. Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes. It is the development and use of new ideas manifested in terms of a new product, service, process or method of production in order to meet demand in the market place (Pérez-Luño, Wiklund & Cabrera, 2011:557; Smith, 2006:6). Risk-taking behaviour typifies the incurring of heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace. Risk-taking is also about venturing into unknown environments or markets in order to exploit opportunities in anticipation of high returns (Le Roux & Bengesi, 2014:609; Rauch, Wiklund, Lumpkin and Frese (2009:763). Pro-activeness refers to how a firm relates to market opportunities in the process of new entry, by seizing initiative in order to meet demand. In line with the above definition, Rauch *et al.* (2009:763) and, Le Roux and Bengesi (2014:608) regard pro-activeness as an opportunity-seeking and forward-looking behaviour that involve the introduction of new products and services ahead of competition. Competitive aggressiveness refers to a firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position, and therefore outperform industry rivals in the marketplace. It is more about competing for demand (Lumpkin & Dess, 1996:140-148). Le Roux and Bengesi (2014:609) view competitive aggressiveness as the firm's response to competitors in order to defend and protect its competitive advantage and market position.

Wang (2008:635) regards EO as a key ingredient for firm success. Rauch *et al.* (2009:763) view EO as the entrepreneurial strategy-making processes that key decision makers use to enact their firm's organizational purpose, sustain its vision, and create competitive advantage(s). The authors point out that based on Miller's (1983) conceptualization, three dimensions of EO have been identified as innovativeness, risk taking, and pro-activeness.

Rauch *et al.* (2009:763), in line with Lumpkin and Dess (1996:162), define innovativeness as the predisposition to engage in creativity and experimentation through the introduction of new products/services as well as technological leadership via research and development (R&D) in new processes; risk taking as taking bold actions by venturing into

the unknown, borrowing heavily and committing significant resources; and pro-activeness as an opportunity-seeking, forward-looking perspective characterized by the introduction of new products and services ahead of competition and acting in anticipation of future demand.

Lumpkin, Cogliser and Schneider (2009:48) assert that EO keeps firms alert by exposing them to new technologies, making them aware of marketplace trends, and helping them evaluate new opportunities. Wang (2008:635), however, cautions that past research indicates that simply examining the direct effect of EO on firm performance provides an incomplete picture. The author contends that learning orientation (LO) has been a missing link in the examination of the EO-performance relationship, and that entrepreneurial firms must foster organizational learning in order to maximize the effect of EO on performance (Wang, 2008:650).

While acknowledging the important role which EO plays in firm performance, Lumpkin and Dess (1996:163) suggest that exploring configurations among EO and other key constructs such as strategy and environmental conditions, may result in a much more stronger association of EO with performance.

Żur (2013:8) refers to EO as the entrepreneurial activity of the firm that, for decades, has been perceived as leverage for market penetration, innovation and new market entry, all of which are associated with enhancing firm performance. It is manifested in the behaviour of the firm in opportunity recognition and exploitation, in introducing innovation, creating new organizations or instigating organizational renewal (Żur, 2013:19). However, as enunciated above, EO may also be applicable at the level of the individual with regards opportunity recognition and exploitation, innovation, venture creation or venture renewal.

Miller (2011) acknowledges that there have been considerable advances in research on EO since his 1983 article which basically focused on three dimensions: innovation, risk-taking, and pro-activeness. New research now treats EO as a process in which entrepreneurs behave in a certain way in creating their "new entry", be it a new product, new market, or new technology (Miller, 2011:875). The author argues that whereas research tended to relate EO directly to performance related to the three – or five dimensions in Lumpkin and Dess (1996), there are now more attempts to use moderating variables and mediators to establish under which organizational and environmental contexts the EO-performance relationship would be the strongest (Miller, 2011:876). The

author concludes that overreliance on cross-sectional data and quantitative research on EO compromise deeper understanding of the EO-performance relationship. In support of this view, Kantur (2016:24) examines the relationship between firm-level entrepreneurship and organisational performance in an emerging economy by assessing whether strategic entrepreneurship mediates the relationship between EO and organizational performance. Strategic entrepreneurship is regarded as actions directed to both opportunity and advantage seeking behavours (Kantur, 2016:25). Her study confirms that strategic entrepreneurship fully mediates this relationship. This is further evidence that mediators and moderators play a role in the EO-performance relationship.

Covin and Wales (2012:681) attempt to clarify the phenomenon of EO further by asserting that Lumpkin and Dess's (1996) conceptualization of EO is more domain-focused, in that it specifies where to look for EO. The authors regard Miller's (1983) conceptualization of EO as being more phenomenon-focused, and less specific in terms of its structure. Unlike discussions, post Lumpkin and Dess (1996) and Miller (1983), which tended to focus on how many dimensions EO has, and the influence they would have on how it is measured, Covin and Wales's (2012: 681) consideration is whether particular conceptualizations of EO will require certain modelling techniques – for instance, whether formative or reflective measurement models should be used. These modelling techniques are defined in chapter four. The authors opine that a reflective measure of EO will be appropriate in cases where a researcher's objective is to apply a measure that has value in more than one structural model, which can be used for theory building and testing (Covin & Wales, 2012:698).

George and Marino (2011:993) lament the inconsistency in the conceptual domain of EO and the challenges that this poses. The authors argue that defining EO differently by various researchers can result in poorly judging the validity of the measures of the construct, and building knowledge around the relationships between EO and other constructs in the nomological network of concepts in the field of entrepreneurship can be rendered impractical (George & Marino, 2011:993). The authors suggest that EO be considered a conceptual family of constructs that build on the original three-dimension definition of innovativeness, pro-activeness and risk-taking. The authors further suggest that EO be conceptualised as a reflective model utilising three dimensions which could be extended by employing a classical classification scheme to identify subcategories of EO for development, operationalization, and testing using new measurement items (George & Marino, 2011:989, 1018).

Wiklund and Shepherd (2011:925) examine two potential causal mechanisms which underlie the observed EO-performance relationship, and find that EO might be a performance-variance-enhancing strategic orientation rather than a performance-mean-enhancing orientation. The authors characterise existing research as "EO-as-advantage", meaning that it pays to pursue an EO, and as a new perspective on the EO-performance relationship, they offer "EO-as-experimentation" which reflect the notion that EO is associated with greater outcome variance that could lead to both success and failure (Wiklund & Shepherd, 2011:925).

The EO-as-experimentation perspective builds on the distinction between exploration and exploitation, where exploration is associated with experimenting, tailing, and entering new product markets. This approach is more consistent with the EO dimensions of innovation, risk-taking and pro-activeness. Exploitation, on the contrary, is associated with producing, reusing, refining, and improving existing product markets (Wiklund & Shepherd, 2011:930). Finally, the authors through their study, and in line with a large number of previous studies, found that EO not only has a positive relationship with relative performance among surviving firms, but that it is also related to the failure of the firm (Wiklund & Shepherd, 2011:937).

In line with Miller's (2011) assertion, various scholars (Alegre & Chiva, 2013; Kollmann & Stöckmann, 2014; Van Doorn, Jansen, Van den Bosch & Volberda, 2013) have come forth with research that highlights the importance of moderating and mediating factors in the relationship between EO and performance.

Alegre and Chiva (2013:494) bring a different perspective to the EO-performance relationship by offering a wider picture that includes two intermediate steps or mediating variables between the EO managerial attitude and final firm performance. Making use of SEM, the authors found that the influence of EO on firm performance is mediated by two variables, namely organizational learning capacity (OLC) and innovation performance. They define OLC as the organizational and managerial characteristics or factors that facilitate the organizational learning process or allow an organization to learn. Innovation performance refers to the firm's product and process innovation (Alegre & Chiva, 2013:492).

Van Doorn *et al.* (2013) add to the above exposition by assessing how a senior-team attributes moderate the relationship between EO and firm performance in a dynamic or

stable environment. The authors consider two distinct attributes of senior-teams, namely: task-related heterogeneity and shared vision. Hambrick, Cho and Chen (1996:663) define senior-team heterogeneity as differences across senior-team members in terms of task-related aspects - for instance, differences in the specific skills needed to perform a certain job. Senior-team shared vision refers to the extent to which senior-team have collective goals and shared aspirations as well as the level of commitment accompanying these goals and aspirations (Jansen, George, Van den Bosch & Volberda, 2008:986). Van Doorn *et al.* (2013:831) conclude that EO positively impacts firm performance, and confirm the existence of a positive relationship between firm performance and senior-team heterogeneity, and between senior-team shared vision and firm performance. The latter two influence the former positively. When the senior-team converge on a vision for the firm, and bring forth constructive ideas on how best to achieve that vision, firm performance is enhanced. Van Doorn *et al.* (2013:832) find that although environmental dynamism does not directly influence the relationship between EO and firm performance, it does impact the functioning of the senior-team attributes in realising the inherent value of EO. Interestingly, senior-team shared vision was found not to moderate the relationship between EO and firm performance (Van Doorn *et al.*, 2013:831-832).

Kollmann and Stöckmann (2014) complement the above narrative of the EO-performance relationship by introducing exploratory innovation and exploitative innovation as mediating variables which account for entrepreneurial behaviour. This is necessitated by contradictory theoretical assertions and mixed empirical results on the validity of the simple direct relationship between EO and firm performance. There is no systematic research addressing a potential reduction of the explanatory power of the EO-performance relationship because EO may not be converted into entrepreneurial behaviour (Kollmann & Stöckmann, 2014:1001-1002). Exploratory innovations respond to and affect latent environmental conditions by creating new products or services, and new markets (He & Wong, 2004:483). Conversely, exploitative innovations respond to current environmental conditions by expanding current products and services and defending existing markets through increasing customer loyalty (Jansen, Van den Bosch & Volberda, 2006:20). Applying the SEM statistical technique, Kollmann and Stöckmann (2014:1019) conclude that it may not be enough just to have EO, and thus an orientation toward entrepreneurship as a way of influencing firm performance. More should be done to

ensure that existing EO translate into actual entrepreneurial behaviour through exploratory innovations and exploitative innovations.

The authors clearly caution against the tendency to take the simple direct relationship between EO and performance for granted, and motivate the need to probe into the likely impact which other factors or variables may have on this relationship.

The next section focuses on agriculture, and its importance to economic development. It considers the relevance of the concept of sustainable development to agriculture, and the importance of sustainable agriculture to entrepreneurial performance in the agricultural context.

2.6 AGRICULTURE AND SUSTAINABILITY

Sachs (2014) defines sustainable development as follows:

"Sustainable development is both a way of understanding the world and a way to help save it. As a method of understanding the world, sustainable development practitioners study the interactions of the economy, social inclusion, and environmental sustainability. Students of sustainable development must therefore learn about a wide range of subjects, including economic development, education, health care, energy systems, biodiversity, and urbanization, among others.

As a method of helping to save the world, sustainable development encourages a holistic approach to human well-being, one that includes economic progress, strong social bonds, and environmental sustainability. The challenges are becoming more urgent as the large and rapidly-growing world economy causes massive environmental destruction, and as new technologies demand new skills. Young people without the appropriate training and skills are likely to find few opportunities for decent jobs and incomes."

The above narrative by Sachs (2014) suits the concept of agricultural sustainability, which is one of the core constructs in the conceptual model of agricultural-entrepreneurial development.

2.6.1 Agriculture and economic development

As stated above, in the context of this study's geographical scope (Namibia), agriculture may be regarded as the activity involving the rearing of livestock, both tamed- and wild animals, and the cultivating of land for crop production. The agricultural sector sustains about 70 per cent of the Namibian population (Bank of Namibia, 2008:5). Kapimbi and Teweldemedhin (2012:169) in support state that, although agriculture contributes only about 6 per cent to the GDP, it is regarded as an important part of Namibia's economy, employing 37 per cent of the work force. However, in 2013, its contribution to employment decreased to 31.4 per cent. During 2014, total unemployment stood at 28.1 per cent (Namibia Statistics Agency, 2014:7,17). The agriculture, forestry and fishing sub-sector remains the biggest employer in Namibia.

In their classical article on the role of agriculture in economic development, Johnston and Mellor (1961:571-581) identify the five types of inter-sectoral linkages that highlight agriculture's contribution to economic growth as follows:

- The provision of increased food supplies.

- Enlarged agricultural exports which are likely to be one of the most promising means of increasing incomes and augmenting foreign exchange earnings in a country stepping up its development efforts.

- The transfer of manpower from agriculture to non-agricultural sectors.

- Agriculture's contribution to capital formation - for instance, the sheer size of the agricultural sector as the only major existing industry points to its importance as a source of capital for overall economic growth; and

- Increased rural net cash income as a stimulus to industrialisation.

De Janvry (2010:20) states that the 1960s emphasis on the role of agriculture in the classical development paradigm, and the subsequent contradictions in its implementation in the 1970s and early 1980s, were followed for 20 years (basically from 1985 to 2005), by the neglect of agriculture, which was seen as a declining industry, not competitive for public investment. The author points out that this long lull in recognizing the importance of agriculture as an instrument for development, and the role of the state in supporting supply

response in agriculture via public goods and institutional reforms, came to an end as a set of crises exposed in the mid-2000s the high cost of neglecting agriculture.

There is once again wider recognition of the important role that agriculture plays in economic development. The World Bank (2008:2) recognises the contribution of agriculture to development in various ways: as an economic activity, as a provider of environmental services, as a source of livelihoods for an estimated 86 per cent of rural people, thereby making the sector a unique instrument for development. De Janvry (2010:18) refers to a new paradigm which has started to emerge where agriculture is seen as having the capacity to help achieve several of the major dimensions of development, most particularly accelerating GDP growth at early stages of development, reducing poverty and vulnerability, narrowing rural-urban income disparities, releasing scarce resources such as water and land for use by other sectors, and delivering a multiplicity of environmental services.

Irz, Lin, Thirtle and Wiggins (2001:452-455) highlight the following as contributions of agricultural growth to poverty reduction:

- Higher incomes for farmers, including smallholders who constitute a large share of the rural poor, especially in Sub-Saharan Africa, have an effect on farm economy.

- Creation of more jobs in agriculture and the food chain has positive effects on the rural economy.

- On a national level, an increase in agricultural output tends to decrease food prices; benefiting consumers and net purchasers of food (which may include farmers).

The above contributions hinge on the degree to which farm production can be traded and how demand reacts to the elasticity of prices (Meijerink & Roza, 2007:11). Johnston and Mellor (1961) recognize the importance of creating an enabling environment when they state: "since agricultural research and extension-education programmes offer tremendous external economies, these functions are normally performed by governmental agencies. Under the conditions existing in low-income countries, it is also frequently desirable for government to encourage the creation of, or even to provide, the institutional facilities, required to supply certain production inputs and credit and to process and market agricultural products" (Johnston & Mellor, 1961:585).

De Janvry (2010:18) posits that a new paradigm has started to emerge where agriculture is seen as having the capacity to contribute to GDP growth, reducing poverty and narrowing rural-urban income disparities. The author identifies two fundamental shortcomings in the implementation of agriculture for the development paradigm in order to achieve the above objectives. One is that there is inadequate clarification of the new role of agriculture for development to correspond to the new development objectives as stated above. The other is that there is need for redesigning methods that will enhance effective implementation of the new agriculture for development paradigm (De Janvry, 2010:18).

According to De Janvry (2010:30-32), reconceptualization of the role of agriculture for development should encapsulate formalising complementarities and trade-offs in the multiple functions of agriculture for development in the emerging context, designing the process of agricultural growth to achieve development, and redefining the role of the state in setting social priorities among conflicting functions and in overcoming market failures for agriculture.

As regards redesigning approaches for the effective implementation of agriculture for development paradigm, De Janvry (2010:30-32) suggests experimenting with new approaches for effective implementation of the new objectives; fixing the governance structure for the state to fulfil its new functions for agriculture; and committing the state and the international community to support the long-term role of agriculture for development above price and political cycles.

Ellis (2005:135) argues that small farms have a future. In Sub-Saharan Africa excluding South Africa, most farming occurs on a small scale, and is dominated by rural populations as a means of livelihood. As a result, no one would argue that improving the performance of small farms should be left off the agenda for poverty reduction in Sub-Saharan Africa (Ellis, 2005:135).

Lessons can be learned from the 1970s Asian Green Revolution which led to food security in that part of the world. A fundamental distinguishing factor is that the 1970s Asian Green Revolution was predicated on comprehensive agricultural support policies. The post-liberalization dispensation, however, which originated from the structural adjustment policies of the 1980s and 1990s in Sub-Saharan Africa, has discouraged and dismantled agricultural support policies (Ellis, 2005:136). The author, therefore, suggests that governments, donors, and non-governmental organizations can encourage and contribute

to the overall climate of facilitation that surrounds individual decisions. In this way they would be supporting and encouraging domestic policies that improve exchange, mobility, communication, information, and infrastructure, as a way of developing the agriculture sector (Ellis, 2005:145).

Birner and Palaniswamy (2006:2) note that there is virtually no example of mass poverty reduction in modern history that did not start with sharp rises in employment and self-employment income owing to increased productivity among small family farms. The author also notes that the African Heads of State at the 2003 Assembly of the African Union in Maputo, eventually acknowledged the role that agriculture needs to play in the development of their economies, and therefore made a commitment to allocate at least 10 per cent of their national budgetary resources to agricultural development.

The declaration of Heads of State and Government of the African Union of 2003 on agriculture and food security in Africa, recognizing that it is Africa's responsibility to reinvigorate its food and agriculture sector for the economic prosperity and welfare of its people, reads:

> *"Implement, as a matter of urgency, the Comprehensive Africa Agriculture Development Programme (CAADP) and flagship projects and evolving Action Plans for agricultural development, at the national, regional and continental levels. To this end, we agree to adopt sound policies for agricultural and rural development, and commit ourselves to allocate at least 10 per cent of national budgetary resources for their implementation within five years".*

However, only 10 of the 54 AU Member States (less than 20 per cent) have achieved the Maputo 10 per cent budget target. Among them are Burkina Faso, Ethiopia, Ghana, Guinea, Malawi, Mali, Niger and Senegal. Similarly, only 10 countries have exceeded the 6 per cent agriculture growth target. These include Angola, Eritrea, Ethiopia, Burkina Faso, The Republic of the Congo, Gambia, Guinea-Bissau, Nigeria, Senegal, and Tanzania (2014: a new era for Africa's rural farmers. Anon, 2014:[75]). Namibia has fallen short of both targets.

Awokuse and Xie (2015:77) allude to mixed results and views on the role of agriculture in economic growth and development. The authors opine that while agriculture could be an engine of economic growth, the impact varies across countries, with evidence in some

supporting the agriculture-led growth hypothesis, whilst in others, having a vibrant aggregate economy is regarded as a prerequisite for agricultural development. In their study which investigates the causal relationship between agriculture and economic growth, Awokuse and Xie (2015:96) conclude that the direction of causality between agriculture and GDP growth depends on the country and could either support the growth-led agriculture development (GLA) or the agriculture-led economic growth (ALG) schools of thought. The authors, therefore, suggest that caution should be exercised before massive investments are made in agriculture without understanding the complex interactions of the various sectors of the economy. In cases, however, where there is evidence of agriculture playing a catalytic role in economic growth, more investment in the agriculture sector is warranted in order to avoid the marginalisation of this sector as has happened when industrialisation-led development was promoted at the expense of agriculture in many developing countries (Awokuse & Xie, 2015:97). This role has been recognised as is evident from various studies by international organisations and researchers.

2.6.2 Agricultural sustainability

World Bank (2011:19) acknowledges that the issue of the sustainability of agricultural systems is now high on the agenda and that the preservation of ecosystems and biodiversity will be important for agriculture as a whole. It points out that soil degradation can have negative effects on the future productivity of land. This has been the case in Africa owing to expansion of land under cultivation in order to increase yields.

World Bank (2011:20) also cautions that global climate change with increasing global temperatures could lead to a drop in agricultural output mostly in tropical countries, and less rainfall could damage rain-fed agriculture and resulting in more frequent droughts. This is a special concern for Sub-Saharan Africa where most agriculture is rain-fed. Consequently, climate change would imply an increased risk for farmers, necessitating African farmers to adapt to the changing climate (World Bank, 2011:20). It also refers to the low adoption rates of new crop varieties and suggests that this may be attributed to people's rudimentary levels of education, missing credit markets and externalities which could be barriers to technology adoption.

Concerns about sustainability in agricultural systems centre on the need to develop technologies and practices that do not have adverse effects on environmental goods and services, and which, in turn farmers find accessible and effective, culminating in improvements in food productivity (Pretty, 2008:447). Müller *et al.* (2011:4313) add to the above exposition by highlighting that the phenomenon of climate change is projected to compromise agricultural production, especially in smallholder systems with little adaptive capacity, as currently is the case in many parts of Africa.

Pretty (2008:451) regards the following as key principles for sustainable agriculture: the integration of biological and ecological processes into food production; the minimal use of non-renewable inputs that cause harm to the environment and the health of farmers and consumers; the productive use of the knowledge and skills of farmers, thus improving their self-reliance; and the productive use of people's collective capacities to work together to solve common agricultural and natural resources problems.

Pretty (2008:451), however, cautions that the idea of agricultural sustainability should not mean disregarding technologies or practices that can improve productivity for farmers and should not cause the environment undue harm.

Nkambule and Dlamini (2012:4003) posit that the advances for better agriculture development have been attributed to the perception of agriculture having contributed significantly to the negative changes the world is currently experiencing in the natural environment. The authors note that human activities around agriculture development have led to huge losses of soil through soil erosion, loss of organic matter, loss of the biotic capacity of soils to nurture plant growth, structural deterioration, compaction and hard setting, nutrient imbalance and leaching, salinity, and diminution of root zone-moisture characteristics, as manifested through reduced water holding capacity and infiltration, draughtiness or water logging.

Nkambule and Dlamini (2012:4004) list the following as guiding principles for agricultural sustainability:

(i)   Maintenance and development of production and services (productivity) – sustainable agriculture calls for appropriate land use and management practices for the achievement of increased yields and improved food production to feed the world population and to reduce poverty.

(ii)   Reduction of production risk (security) – farmers must be able to evaluate business, technical and market risks associated with their agricultural enterprise.

(iii)   Natural resources conservation and prevention of degradation (protection) – this entails matching land uses to the constraints of local environment, planning for production not exceeding the biological potentials of the area, carefully limiting fertilizer, pesticides and other inputs to ensure that they do not exceed the capacity of the environment to absorb and filter any excess.

(iv)   Economic viability (profitability) – this entails profit maximization through the proper selection of enterprises, sound financial planning, proactive marketing, risk management and good management.

(v)   Social acceptability (social justice) – a sustainable agricultural system improves the quality of life of individuals and communities.

As Obasanjo (2013) argues, there is an urgent need for a shift from subsistence farming as currently practised by the majority of Africa, to commercial agribusiness manifested in smallholder irrigation schemes. According to Nkambule and Dlamini (2012:4005), for instance, smallholder irrigation in sustainable agriculture results in improved agricultural productivity, reduced production risk, natural resource conservation and degradation, a contribution to societal growth and poverty reduction, and ultimately to economic growth. The authors acknowledge the important role of smallholder farming and advocate for strategies that will ensure sustainability within smallholder irrigation projects to enhance their viability and food security in the rural communities.

In line with the above view on smallholder agriculture as an important role player to livelihoods, Jayne, Chamberlin, and Headey (2014:12-14) caution that intensive land utilisation due to rising population in rural areas may not be sustainable without more holistic and effective public support. The authors lament the devotion of state resources to developing land for large-scale commercial farming by African governments whilst neglecting investmenting in customary tenure areas and small-scale commercial farming. This is in contrast to Collier and Dercon (2014:92), who question the rationale for an exclusive focus on smallholder agriculture as the main pathway for African agricultural growth. According to these authors, there is a need for new institutional and policy frameworks for alternative modes of sustainable agricultural production, as opposed to a

narrow focus on smallholder agriculture, if increased agricultural production commensurate with fast growing populations is to be achieved.

Mmbengwa, Groenewald and Van Schalkwyk (2013:2996) acknowledge the importance of agricultural sustainability by recommending that capacity building programmes which are aimed at consolidating and developing entrepreneurial capacity in the agriculture sector should consider innovation, risk-taking, financial and infrastructural capacities as priorities for enhancing an enabling environment for sustainable agriculture. The authors further recommend that policy aiming at empowering entrepreneurs from poverty-stricken rural and peri-urban areas should emphasize these priority factors. Incubating organizations should also provide prioritised or elevated support services for the above key success factors (Mmbengwa *et al.*, 2013:3011).

Recent perspectives on agricultural sustainability by Banson, Nguyen, Bosch and Nguyen (2015) advocate a system thinking approach to address the complex agri-business challenges in order to ensure sustainable development in Africa. In this regard, they use casual loop and Bayesian belief network modelling to develop systems models that will help governments to analyse the performance or impact of food and agriculture policies. This approach views problems as parts of an overall system and is a departure from the traditional approach of short-term solutions to only some aspects of the problems faced (Banson *et al.*, 2015:674, 676).

The next section examines literature on entrepreneurial performance as the core construct and ultimate condition for entrepreneurial outcomes in the context of this study.

2.7   ENTREPRENEURIAL PERFORMANCE

Performance is a recurrent theme in most branches of management, including strategic management, and is of interest to both academic scholars and practicing managers (Venkatraman & Ramanujam, 1986:801). According to Lucky (2011:3) performance is a measurement or indicator for the evaluation or assessment of individuals, groups, firms and organizations. The author emphasises the importance of distinguishing between entrepreneurial performance and firm performance. Lucky (2011:3) argues that entrepreneurial performance refers to an individual (owner/entrepreneur) whereas firm

performance refers to the organization or company, both of which combine into business performance.

Lucky (2011:3) advocates for the classification of business performance into two major groups: the firm/organizational performance and the owner/entrepreneur performance (as depicted in Figure 2.2 below).

Figure 2.2: **Types of performance**
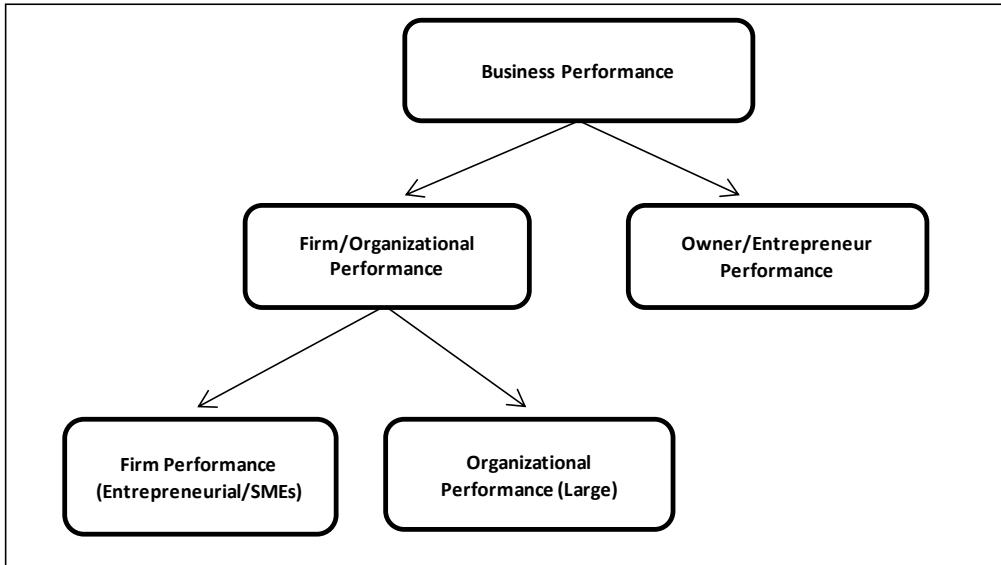
The above narrative means that one measures either the firm/organizational performance or the owner/entrepreneur performance. The author, however, acknowledges that both concepts utilise the same performance measurement indicators (efficiency, growth, size, liquidity, success/failure, market share and leverage) to achieve their objectives.

This study is about building a development model to enhance entrepreneurship in the agricultural sector. In doing so, it aims at identifying variables or indicators that could best measure entrepreneurial performance – what Lucky (2011:3) labels "firm performance" - in terms of improving the entrepreneurial skills of farmers it implies enabling them to manage their farms profitably, and measure supportive environment, entrepreneurial orientation, entrepreneurial competencies and agricultural sustainability. This occurs in the context of providing an enabling environment for enhancing entrepreneurial performance. Murphy, Trailer and Hill (1996:15) emphasise that accurate performance measurement is critical to understanding new venture and small business success and failure. According to these authors, little consistency in performance measurement across studies was found. Instead,

a wide diversity of measures was relied upon, impeding theory development, and resulting in difficulty when developing useful prescriptions for entrepreneurs (Murphy *et al.*,1996:15).

Rauch *et al.* (2009:765) distinguish between financial and non-financial measures or indicators of performance. The authors define financial measures as factors such as sales growth and return on investment (ROI); and non-financial measures such as satisfaction, and global success ratings. This is usually the feedback given by owners or business managers. In support of the above, Lucky (2011:3) states the following as indicators of performance: efficiency, growth, profit, size, liquidity, success/failure, market share and leverage. These are the same factors which Murphy *et al.* (1996:16) refer to as dimensions of performance. Venkatraman and Ramanujam's (1986) model classifies performance measures as being financial or operational, similar to the classification by Rauch *et al.* (2009:765). Operational performance in this classification is taken to reflect non-financial measures of performance.

Venkatraman and Ramanujam (1986:804) conceptualise business performance to include both indicators of operational performance (i.e., non-financial) and indicators of financial performance. The authors assert that the inclusion of operational performance indicators goes beyond the approach that seems to characterise the exclusive use of financial indicators and focuses on those key operational success factors that might lead to financial performance. Under this framework, it would be logical to treat such measures as market-share, new product introduction, product quality, marketing effectiveness, manufacturing value-added, and other measures of technological efficiency within the domain of business performance (Venkatraman & Ramanujam 1986:804). This essentially implies that performance measurement could be improved by examining multiple dimensions of performance (Murphy *et al.*,1996:17).

Antonites (2003:41) qualifies the role entrepreneurial training plays as an intervention in the successful achievement of objectives or the desired increase in entrepreneurial performance as a vital part of the entrepreneurial process. The author, through his entrepreneurial training model reported in Table 2.2 below, posits that entrepreneurial performance is a function of performance motivation (M); entrepreneurial skills (E/S); and business skills (B/S). E/S is composed of risk propensity, creativity and innovation, opportunity identification, and role models. B/S constitutes general management skills,

marketing skills, legal skills, operational skills, human resource management skills, communication skills, financial skills, and the ability to compile a business plan. These factors will be elaborated upon in the next chapter that deals with literature review on models on entrepreneurship development.

Timmons and Spinelli (2007:15) supports the above by stating that successful entrepreneurs possess not only creative and innovative skills, but also solid management skills, business know-how, and sufficient contacts, which inventors and promoters often lack. These are equally important skills that can enhance the efficient and effective **management of the business.**

Table 2.2: The entrepreneurship training model towards entrepreneurial performance

Entrepreneurial Performance (E/P)	Performance motivation (M)	Entrepreneurial skills (E/S)	Business skills (B/S)
Establishment of own business	Performance motivation	Risk propensity	General management skills
Completion of first transactions		Creativity and innovation	Marketing skills
Growth in net value of business		Opportunity identification	Legal skills
Recruitment of employees		Role models	Operational skills
Increasing productivity levels			Human resources management skills
Increasing profitability			Communication skills
			Business plan skills
			Financial skills

Source: Adapted from Antonites (2003:41).

In a study to analyse the determinants of entrepreneurial performance in French competitiveness clusters, Bonnafous-Boucher, De Géry and Laviolette (2011:2) argue that entrepreneurial performance can be measured through a set of traditional economic indicators such as firm creation rate, survival rate, the percentage of enterprises taken

over, the size of the SMEs, and the percentage of SMEs active in the export market. Bonnafous-Boucher *et al.* (2011:5) list the following as determinants of entrepreneurial performance: regulatory framework, market conditions, access to funding, R&D and technology, entrepreneurial capacities, and entrepreneurial culture. Table 2.3 below schematically represents such determinants and their respective performance measures.

The OECD Eurostat entrepreneurship indicator programme represents an initial attempt to collect, compare and analyse international data on new job-creating enterprises. By measuring the rate of creation or closure of new companies, and by evaluating the impact of small companies on employment, economic activity and trade, the programme attempts to build a database capable of helping the public authorities develop an encouraging environment for entrepreneurship (Bonnafous-Boucher *et al.*, 2011:4). The determinants of entrepreneurial performance depicted in Tables 2.2 and 2.3 will be further explored in chapter three which will explore current models on entrepreneurship and agriculture.

De Vries, Liebregts and Van Stel (2013:3) investigate the influence of start-up motivation of solo self-employed people (opportunity versus necessity) on entrepreneurial performance, and to what extent human capital mediates this relationship. The authors refer to opportunity entrepreneurs as those who start a new venture to exploit a unique business opportunity, whereas necessity entrepreneurs are those who start a venture as an option of last resort. Solo self-employed are considered as individuals who independently undertake entrepreneurial activities without employing another person, and who indicate that they mainly offer labour in the form of knowledge and skills instead of selling goods (De Vries *et al.*, 2013:4-5).

Table 2.3: Determinants of entrepreneurial performance

Regulatory framework	Market Conditions	Access to funding	R&D and technologies	Entrepreneurial capacities	Culture
Administrative barriers to entry	Anti-trust laws	Access to debt funding	R&D investments	Training and experience of entrepreneurs	Attitude to risk
Administrative barriers to growth	Competition	Business Angels	University/ industry interface	Business and entrepreneurship competencies	Attitude to entrepreneurs

Regulatory framework	Market Conditions	Access to funding	R&D and technologies	Entrepreneurial capacities	Culture
Bankruptcy legislation	Access to the domestic market	Access to venture capital	Inter-firm technological cooperation	Entrepreneurial infrastructures	Desire to own a business
Laws on security, health and the environment	Access to foreign markets	Access to other own capital	Technological diffusion	Immigration	Entrepreneurship education
Product regulation	Degree of public involvement	Capital markets	Broadband access		
Labour market regulation	government contracts		Patent system; standards		
Justice and the legal framework					
Social security					
Income tax					
Tax on capital					

Source: Adapted from Bonnafous-Boucher *et al.* (2011:4).

It appears that necessity-driven solo self-employed persons perform worse than opportunity-driven solo self-employed persons, and also that formal education and practical learning hardly mediate the relationship between start-up motivation and entrepreneurial performance (De Vries *et al.*, 2013:3).The authors, however, suggest that other aspects of human capital such as entrepreneurial talent and skills, industry experience and intrinsic motivation may explain the performance difference between opportunity and necessity solo self-employed, and should be considered (De Vries *et al.*, 2013:10).

The policy implications can vary depending on the policy motives at play. If the policy objective is to stimulate economic growth through entrepreneurship, opportunity-driven entrepreneurship would be the most desirable. On the other hand, if the policy objective is

to ameliorate the socio-economic situation in a country, such as high unemployment, necessity-driven entrepreneurship can provide a certain level of subsistence and will therefore be desirable (De Vries *et al.*, (2013:10).

Bastié, Cieply and Cussy (2013:865) investigate the determinants of takeovers versus start-ups as a mode of entry into entrepreneurship, focusing on two determinants that previous research has not fully analysed. These two determinants are: social capital and financial capital. Social capital refers to networks of relationships in which personal and organizational contacts are closely embedded, and which are likely to improve the entrepreneur's human capital by enhancing the individual's ability to identify opportunities, acquire new resources, and develop an entrepreneurial spirit. Belonging to an entrepreneurial network has the potential to encourage risk-taking and the attraction of start-ups. Networks provide information that can be used to spot entrepreneurial opportunities for start-ups (Bastié *et al.*, 2013:866-867). The above narrative confirms the positive impact which social capital and financial capital have on entrepreneurship and entrepreneurial performance.

In a recent study on Chinese automobile firms, Sun, Yao, Zhang, Chen and Liu (2016) add to the debate on entrepreneurial performance through the lens of entrepreneurial environment and market-oriented strategies. According to these authors, entrepreneurial environment is measured or constituted by the institutional environment and the indusrial environment, the latter two representing external factors that influence entrepreneurs when starting new firms (Sun *et al.*, 2016:548). Their study confirms the existence of a positive relationship between the uncertainty of the institutional environment and market-oriented strategies, which in turn impacts entrepreneurial performance positively. Consequently, the institutional environment, which in the context of the present study may be equated with the supportive environment, can be an enabler of entrepreneurial performance.

2.8   SUMMARY

This chapter presented a literature review on entrepreneurship as a discipline, its development, and its contribution to economic development. Concepts that have a bearing on entrepreneurship development such as entrepreneurial orientation and enabling environments (supportive and cooperative environments) were also reviewed. Literature

on entrepreneurial performance, which is the core construct for this study, was also reviewed. Factors that could enhance entrepreneurial performance will be elaborated upon in chapter three. These will explore current models on entrepreneurship and agriculture development as the basis for formulating the conceptual model on agricultural entrepreneurship.

This chapter further reviewed literature on agriculture, particularly from a sustainability perspective. It is apparent that supportive environment, entrepreneurial orientation, agricultural sustainability, entrepreneurial competencies, and entrepreneurial performance are relevant constructs that could underpin the development of the conceptual model of agricultural-entrepreneurial development. Entrepreneurial performance is a dependent variable, and therefore, the unit of analysis in this study.

The next chapter will review literature on current frameworks and models in entrepreneurship and agriculture development as the basis for developing the conceptual model for agricultural-entrepreneurial development.

CHAPTER 3
CONCEPTUAL FRAMEWORKS AND MODELS ON ENTREPRENEURSHIP AND AGRICULTURE DEVELOPMENT

3.1   INTRODUCTION

As argued in chapter two, entrepreneurship plays a central role in employment creation, poverty reduction, the improvement of livelihoods, and economic development. It was also emphasised that this is contingent on the creation of an environment conducive for potential entrepreneurs to explore, discover and exploit business opportunities. Literature confirms a link between entrepreneurship or entrepreneurial performance, and concepts such as entrepreneurial orientation, enabling environment (supportive and cooperative environments), and entrepreneurial competencies (Carlsson *et al.*, 2013; Duval-Couetil, 2013; George & Marino, 2011; Gnyawali & Fogel, 1994; Miller, 2011; Morris *et al.*, 2013; Lans *et al.*, 2014; Lumpkin, Cogliser & Schneider, 2009; Wiklund & Shepherd, 2011).

Furthermore, the important role that agriculture plays in economic development has been re-affirmed by recent undertakings and commitment to fund agriculture development. The phenomenon of climate change which negatively affects food production and food security has elevated the concept of sustainability in agricultural systems. It has also created a need for the formulation and implementation of environmental-friendly policies by governments (Nkambule & Dlamini, 2012; Pretty, 2008).

This chapter reviews literature on entrepreneurial performance and agricultural development. It does so by building a narrative of available frameworks and models of entrepreneurship and agriculture. It is structured to introduce the contributions of different authors, with the objective of identifying concepts and relationships that are relevant for building the model of the present study. A critical evaluation of each of these frameworks and models is performed in sections 3.4 and 3.5 of this chapter in order to determine their contribution to building the envisaged model.

The following section presents concepts and theoretical frameworks on entrepreneurial performance.

3.2 CONCEPTUAL FRAMEWORKS AND MODELS ON ENTREPRENEURSHIP

3.2.1 Environments, strategy and performance model (Prescott, 1986)

Prescott (1986) undertook a model-based study which examined the relationship between environment, strategy and performance. Porter (1981:610) states that the field of industrial organizational economics has emphasized the linkage between environment and performance, and thus, has viewed environments as primary determinants of performance. Prescot (1986), therefore, set out to determine whether environments do influence performance independently, or whether they modify the strength or the form of the relationship between strategy and performance. The author used moderated regression and subgroup analysis to explore the moderating influence of environment on the relationship between strategy and performance. The results demonstrated that environments, as measured by characteristics of market structures, moderate the strength but not the form of relationships between strategy and performance. The author concludes that environment is critical because it establishes the context in which to evaluate the importance of various relationships between strategy and performance, but recommends that contingency theory and research should focus on identifying meaningful sub-environments and on examining strategy-performance relationships with and across these sub-environments (Prescott, 1986:342).

3.2.2 A conceptual model of entrepreneurship as firm behaviour (Covin & Slevin, 1991)

Covin and Slevin (1991) developed a conceptual model of entrepreneurship as firm behaviour which depicts the organizational system elements that relate to entrepreneurial behaviour among larger, more established firms. These, however, are also applicable in varying degrees to many smaller firms. The authors posit that adopting a firm-behaviour model of entrepreneurship has a number of advantages, when compared with more traditional entrepreneurship models and theories that focus on traits of the individual entrepreneur. Considering the level-of-analysis issue first, a firm-level model of

entrepreneurship is appropriate because entrepreneurial effectiveness is arguably a firm-level phenomenon. That is, an entrepreneur's effectiveness can be measured in terms of his or her firm's performance (Covin & Slevin, 1991:8).

Covin and Slevin (1991:9) mention the elements of a meaningful model of entrepreneurship as firm behaviour, where the ultimate dependent variable is firm performance and the variables are defined clearly. The model includes environmental, organizational, and individual-level variables and both direct and moderator effects. A conceptual model, by definition, must depict direct or main effects between the component variables.

As depicted in Figure 3.1, the model shows the antecedents and consequences of an entrepreneurial posture as well as the variables that moderate the relationship between entrepreneurial posture and firm performance. Entrepreneurial posture represents a firm's risk-taking propensity, innovativeness and pro-activeness (Covin & Slevin, 1991:7, 10). According to the authors, the concept of external environment is intended to include those forces and elements external to the organization's boundaries that affect and are affected by an organization's actions. Included too, are more general economic, socio-cultural, political-legal, and technological forces which provide the broader context for the organization's operations. Clearly an abundance of research, utilizing diverse methods and models, has demonstrated that the external environment has a strong, if not a deterministic influence, on the existence and effectiveness of entrepreneurial activity, and that such activity can lead to improved performance in established organizations (Covin & Slevin, 1991:11&19).

However, the authors caution that there is little systematic empirical evidence to support the belief in a strong positive relationship between entrepreneurial posture and firm performance.

The authors conclude that the proposed conceptual model, despite its limitations in terms of applicability to new ventures and small businesses, presents numerous specific relationships that are open to investigation.

Figure 3.1: A conceptual model of entrepreneurship as firm performance
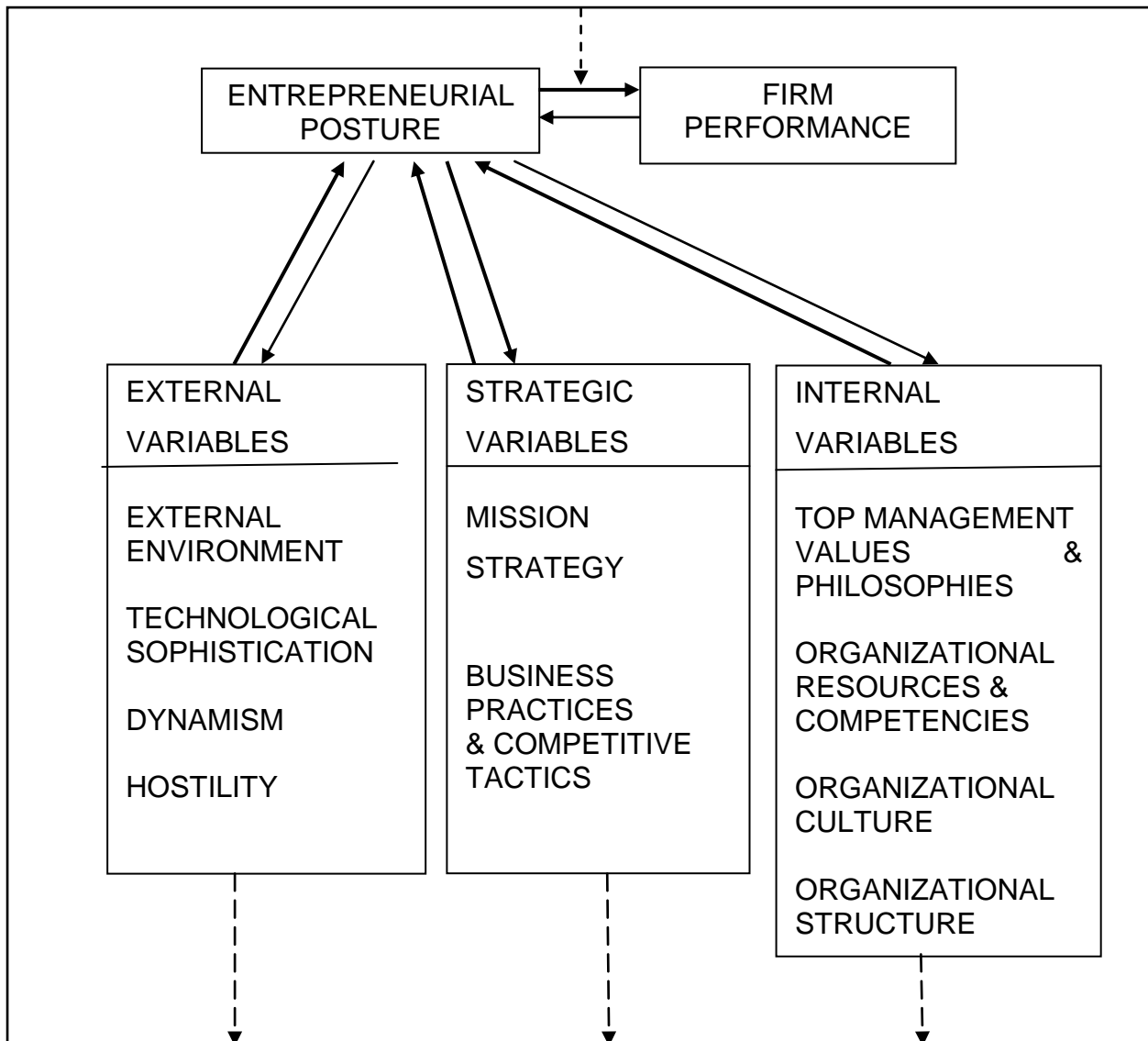
Source: Adapted from Covin and Slevin (1991:10)

An important contribution that will shape future research in the area of firm-level entrepreneurship, Zahra (1993:5-11) suggests further work to their conceptual model in the following areas: the nature of entrepreneurial posture; the locus of entrepreneurship; redundancy in some constructs in the model; and the nature of the link between entrepreneurial posture and firm performance. The author argues that other dimensions of firm-level entrepreneurship, such as informal entrepreneurship activities, should be given due recognition considering that these occur or cut across multiple levels within a firm, rather than focusing only on the intensity dimension of entrepreneurship (Zahra, 1993:7).

While concurring with Covin and Slevin's (1991) exposition that behaviours are the defining attributes of entrepreneurial firms, Covin and Lumpkin (2011:858) ,however, argue that a firm must exhibit entrepreneurial behaviours on an ongoing or sustained basis, such that, that pattern of behaviour is generally recognized as a defining attribute of the firm. The occasional exhibition of firm-level entrepreneurial behaviour is insufficient to infer the existence of an entrepreneurial posture.

Żur (2013:9) also concurs with the above line of thought that sustained behavioural patterns are a necessary condition for entrepreneurship to be recognized as a defining attribute of the organization. The author agrees with Covin and Slevin (1991) that these specific behavioural patterns consist of risk-taking, innovation and pro-activeness as originally defined in Miller (1983), simultaneously at the same time cautioning about the insufficient attention that has been given to the performance effects of excessive entrepreneurship resulting from over-indulgence in those three dimensions.

3.2.3 Environment, corporate entrepreneurship, and financial performance model: a taxonomic approach (Zahra, 1993)

Zahra (1993) empirically examined the association among the external environment, corporate entrepreneurship, and financial performance. The author adopted a taxonomic approach that simultaneously considers multiple dimensions of a firm's environment. He identified two dimensions of corporate entrepreneurship, namely: corporate innovation and venturing and corporate renewal activities. The dimension of corporate innovation and venturing encapsulates new business creation, new product introduction, percentage of revenue from new products, and technological entrepreneurship. The dimension of corporate renewal activities consists of mission reformulation, reorganization, and system-wide change (Zahra, 1993:319).

These dimensions were used as input into cluster analysis to identify distinct environmental settings. They were then, in turn, used to clarify variations in corporate entrepreneurship activities. The author used the clustered environmental settings to examine the associations between corporate entrepreneurship and company financial performance within different environmental settings (Zahra, 1993:320).

The results of the study show that each environmental cluster had a distinct combination of activities relating to corporate innovation and venturing; that corporate entrepreneurship activities varied in their association with measures of company growth and profitability; and that the association between corporate entrepreneurship and company financial performance varied among the environment clusters.

Zahra's (1993) study, although focusing on the environment as an antecedent of corporate entrepreneurship, does not refute the possibility that corporate entrepreneurship can be an antecedent of company performance, and that performance induces corporate entrepreneurship (Zahra, 1993:332-333). The author also emphasizes the need for recognizing the importance of the external environment for the pursuit of corporate entrepreneurship. In this vein, in the context of the present study, the enabling environments (supportive environment, entrepreneurial orientation, agricultural sustainability and entrepreneurial competencies) are hypothesized to enhance entrepreneurial performance.

3.2.4 A framework and an integrative model of entrepreneurial environments (Gnyawali & Fogel, 1994)

As indicated in chapter two, Gnyawali and Fogel (1994) developed an integrated framework for studying the environmental conditions conducive for entrepreneurship development in an effort to integrate the highly fragmented literature on entrepreneurial environments. The authors introduced the core elements of the new venture creation process and explicitly linked the environmental dimensions to the process of new venture creation, showing how environments can help increase people's likelihood to start a business. These environmental conditions are grouped into five dimensions as follows: government policies and procedures, socio-economic conditions, entrepreneurial and business skills, financial support to businesses, and non-financial support to businesses.

Table 3.1 presents the framework, and the environmental dimensions are outlined (Gnyawali & Fogel, 1994:45):

- Government Policies and Procedures

Government can influence market mechanisms and make them function efficiently by removing conditions that create market imperfections and administrative barriers. The authors caution that entrepreneurs may be discouraged to start a business if they have to follow many rules and procedures, report to many institutions, and spend more money and time in fulfilling the procedural requirements.

- Socio-economic Conditions

Entrepreneurship may not prosper if most members of the society view it with suspicion. The authors advocate for a favourable attitude of the society toward entrepreneurship, and widespread public support for entrepreneurial activities which are both needed to motivate people to start a new business.

Table 3.1: A framework for entrepreneurial environments

Government Policies and Procedures	Financial Assistance
Restrictions on imports and exports	Venture capital
Provision of bankruptcy laws	Alternative sources of financing
Entry barriers	Low-cost loans
Procedural requirements for registration and licensing	Willingness of financial institutions to finance small entrepreneurs
Number of institutions for entrepreneurs to report to	Credit guarantee programme for start-up enterprises
Rules and regulations governing entrepreneurial activities	Competition among financial institutions
Laws to protect proprietary rights	
Socio-economic Conditions	**Non-Financial Assistance**
Public attitude toward entrepreneurship	Counselling and support services
Presence of experienced entrepreneurs	Entrepreneurial networks
Successful role models	Incubator facilities
Existence of persons with entrepreneurial characteristics	Government procurement programmes for small businesses
Recognition of exemplary entrepreneurial performance	Government support for research and development
Proportion of small firms in the population of firms	Tax incentives and exemptions
Diversity of economic activities	Local and international information networks
Extent of economic growth	Modern transport and communication facilities

Entrepreneurial and Business Skills	
Technical and vocational education	
Business education	
Entrepreneurial training programmes	
Technical and vocational training programmes	
Availability of information	

<u>Source</u>: Adapted from Gnyawali and Fogel (1994:46).

- Entrepreneurial and Business Skills

Training and educational services are particularly important in emerging market economies because entrepreneurs lack basic business and technical skills which could enable them to overcome various problems they encounter at different stages of their business development.

- Financial Support to Businesses

Entrepreneurs require financial assistance for reasons of either diversifying or spreading the start-up risk, or accumulating start-up capital, or financing growth and expansion. According to the authors, in most developing countries and emerging market economies, venture capital companies and commercial banks are limited and alternative sources of financing are almost non-existent.

- Non-Financial Support to Businesses

Entrepreneurs need most assistance in conducting market studies, in preparing business plans, and in getting loans. Business incubation, networking, government procurement programmes, and modern transport and communication facilities are some of the elements of the non-financial dimension which the authors consider instrumental to entrepreneurship development.

Gnyawali and Fogel (1994:54) developed the Integrative Model of Entrepreneurial Environments by linking the environmental dimension to the core elements of new venture creation. The authors identify these core elements as opportunity, propensity to enterprise, and ability to enterprise. Opportunity refers to the extent to which possibilities for new venture exist and the extent to which entrepreneurs have the leeway to influence their odds for success through their own actions. Propensity to enterprise refers to people with certain behavioural characteristics who are able to perceive the opportunities available in

the environment, seize such opportunities, and then turn such opportunities into profitable ventures. The ability to enterprise refers to the sum of technical and business capabilities required to start and manage a business (Gnyawali & Fogel, 1994:53-54).

Figure 3.2 depicts the Integrative Model of Entrepreneurial Environments. The dimension of the environment relating to the opportunity includes macroeconomic policies and procedures; yet the dimension of the environment relating to the propensity to enterprise comprises socio-economic factors. The dimension of the environment that relates to the ability to enterprise, and therefore, the likelihood to enterprise, constitutes entrepreneurial and business skills (Gnyawali & Fogel, 1994:55).

The implications for public policy of their conceptual model are that governments can contribute to entrepreneurship by adopting policies and procedures that provide a broader scope of opportunities to entrepreneurs.

Figure 3.2: An integrative model of entrepreneurial environments
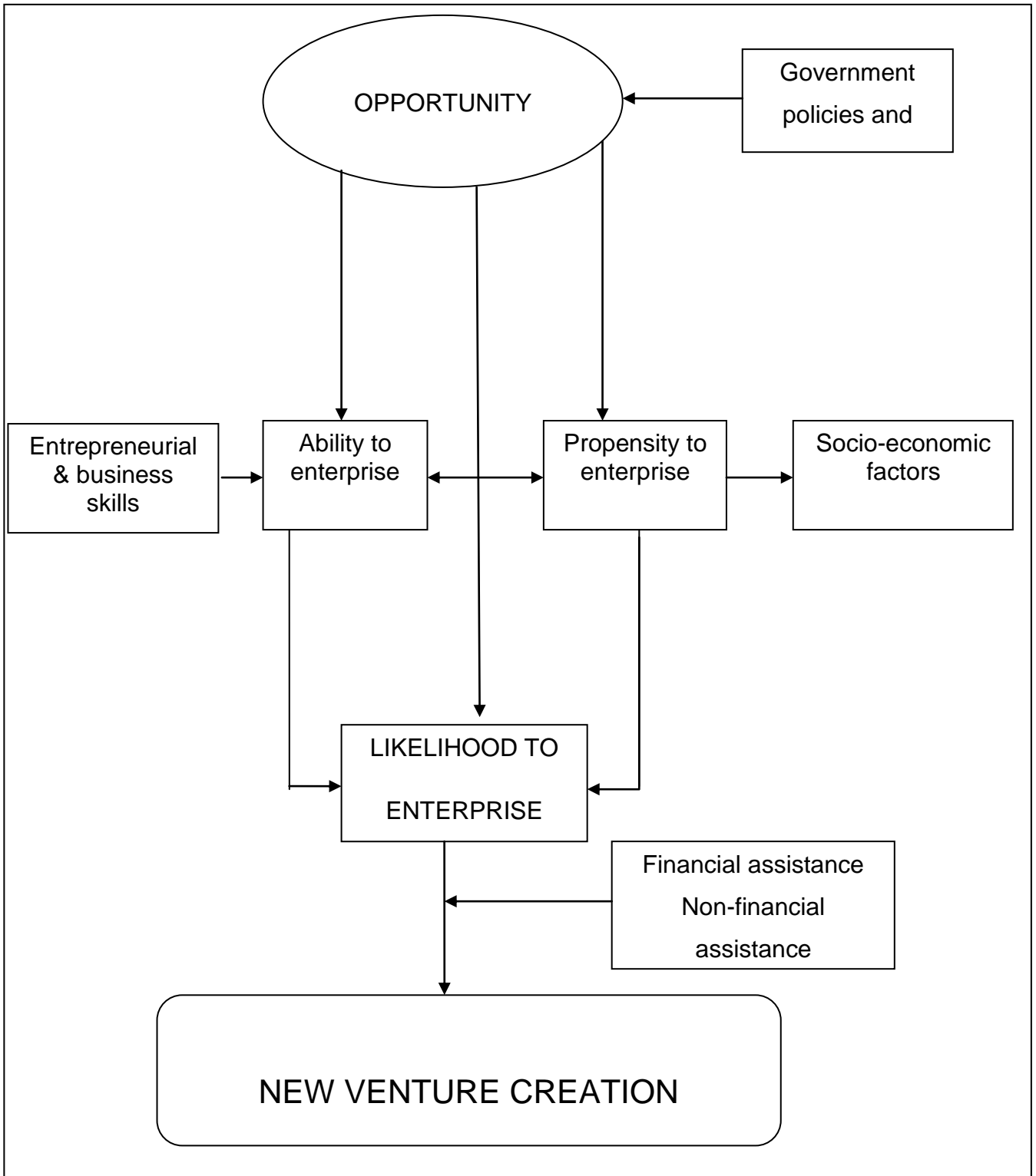
Source: Adapted from Gnyawali and Fogel (1994:56).

Furthermore, governments whose countries have low propensity to enterprise but high ability to enterprise could design policies and programmes aimed at improving the socio-economic dimension of the environment. On the contrary, governments whose countries

have low levels of ability to enterprise but high levels of propensity to enterprise could develop policies and programmes that enhance the entrepreneurial and business skills of the potential entrepreneurs. However, cautioning is needed when offering broad-based financial assistance to potential entrepreneurs in countries where propensity and ability to enterprise are low.

Referring to studies by Covin and Slevin (1991); Venkatraman and Prescott (1990); and Zahra (1993) which have documented the influence of environmental factors on firm performance, Gnyawali and Fogel (1994:58) suggest that similar relationships may exist between environmental factors and performance of an individual entrepreneur, and that a match between specific requirements of the entrepreneur and environmental forces would lead to greater likelihood of business start-up and success.

Edelman and Yli-Renko (2010:833, 836) take a slightly different approach to the issue of venture-creation. The authors cite two conflicting theories expounded in recent literature, namely the "discovery" perspective and the "creation" perspective. The discovery perspective purports that, objective environmental conditions (e.g., technological or regulatory changes) are the source of entrepreneurial opportunities and, therefore, drivers of subsequent entrepreneurial action; thus playing a more prominent role. In contrast, in the creation perspective, entrepreneurial perception and socio-cognition processes play a more discernible role than in the discovery perspective.

Integrating insights from both the discovery and creation perspectives, Edelman and Yli-Renko (2010:835) suggest that the objective opportunity and resource environment (the discovery perspective) are not the only determinants of new venture creation, but the entrepreneur's perception and interpretation (creation perspective) of these factors and the resulting entrepreneurial actions are critical.

It is worth re-emphasizing a proposition made earlier by these authors that although the provision of resources for entrepreneurs and the easing of structural environmental constraints are vital and central to current policy initiatives, a complementary approach would be to encourage the perception of opportunities. This is possible through increased emphasis on creativity and problem-solving skills in entrepreneurship education, thereby spurring venture-creation efforts.

Edelman and Yli-Renko (2010:851) regard their contribution to the development of a more integrative model of the venture start-up process that draws on both the objective and subjective notions of opportunity and resources as significant; ultimately bridging the debate between the discovery and creation perspectives of entrepreneurship.

Notwithstanding, for the purposes of this study, the framework and integrative model of entrepreneurial environments developed by Gnyawali and Fogel (1994) present useful insights and guidance for the development of an agricultural-entrepreneurial developmental model.

3.2.5 A conceptual framework on transfer of technology to promote entrepreneurship in developing countries (Lado & Vozikis, 1996)

Lado and Vozikis (1996:55) explore the role of technology transfer to promote entrepreneurship in developing countries. The authors argue that entrepreneurial development depends, inter alia, on the technological content and context, mode of technology transfer, the recipient country's level of economic development, and the absorptive capacity of local firms. Lado and Vozikis (1996:56) define technology transfer as the transmission of know-how to suit local conditions, with effective absorption and diffusion both within and from one country to another.

Figure 3.3 below depicts the relationship between technology transfer and entrepreneurial development. Lado and Vozikis (1996:57) argue that technology transfer content and context drive the choice of mode of technology transfer which, in turn, influences entrepreneurial development in developing countries. According to the authors, this depends on the recipient country's level of economic development, and the recipient firm's absorptive capacity.

Figure 3.3: Technology transfer and entrepreneurial development
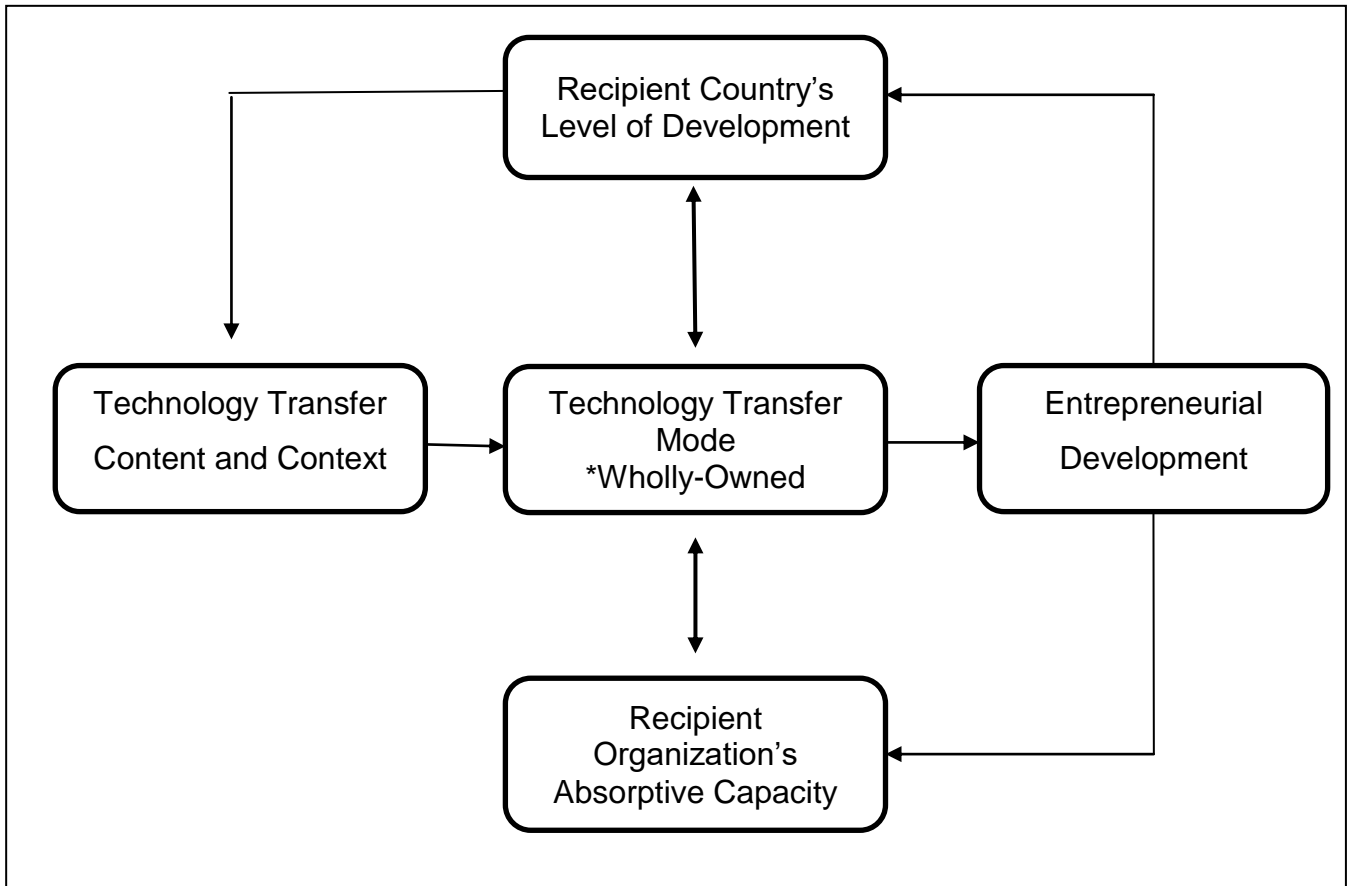
Source: Adapted from Lado and Vozikis (1996:58).

Lado & Vozikis (1996:59) maintain that in order for technology transfer to have a meaningful impact on entrepreneurship development, it is essential that its content matches the technological requirements of the recipient country that would enable it to transform resources into valuable goods and services. This again hinges on whether or not the imported technology can be effectively utilized by a recipient country with its existing stock of knowledge, skills and related capabilities. The authors also identified goal congruence, resource complementarity, and venture risk as contextual factors that impinge on the choice of technology transfer mode. Goal congruence determines the degree to which the goals of the partners are perceived to be compatible with one another. Resource complementarity refers to the extent to which a company's resources and capabilities require another company's resources and capabilities in order to produce given products or to exploit a particular technological innovation. Venture risk refers to the risk associated with launching and operating a venture in a foreign territory (Lado & Vozikis, 1996:58-61).

The recipient organization's absorptive capacity is a function of several attributes. These include production, marketing, and managerial capabilities; and the ability to identify opportunities in the local environment and consequently deliver product offerings that effectively meet customers' preferences and tastes (Lado & Vozikis, 1996:63-64).

The integrative model of technology transfer in Figure 3.3 brings out the following salient points: entrepreneurship research shifts from a micro-level orientation to a macro-level emphasizing entrepreneurship as critical for economic development; technology transfer considerations are critically important in fostering and facilitating entrepreneurship and stimulating socio-economic development; governments in developing countries should focus on creating an environment which is conducive to local entrepreneurial development; and content and context of technology transfer hinge on the recipient country's level of economic development, and the recipient firm's capacity to absorb and effectively utilize the imported technology.

In the context of the present study, this means that for technology transfer to be effective in advancing entrepreneurial performance in the agriculture sector, a need exists to upgrade the skills of potential recipient farmers which would enable them to apply imported technology more efficiently.

3.2.6 The entrepreneurship training model (Antonites, 2003)

Antonites (2003), with insights from Van Vuuren (1997), develops the entrepreneurship training model which rests on the premise that entrepreneurial performance (EP) is a function of performance motivation, entrepreneurial skills, and business skills. The author's model is depicted in Table 3.2.

Antonites (2003:41) regards the following factors as symptomatic of EP: establishment of own business, completion of first transactions, growth in net value of assets, recruitment of employees (implying expansion of the business), increasing productivity levels, and increasing profitability. Entrepreneurial skills comprise risk propensity, creativity and innovation, opportunity identification, and role models. Business skills represent the following attributes: general management skills, marketing skills, legal skills, operational

skills, human resources management skills, communication skills, business plan, and financial skills (Antonites, 2003:41).

Table 3.2: The entrepreneurship training model towards entrepreneurial performance

Entrepreneurial Performance (E/P)	Performance motivation (M)	Entrepreneurial skills (E/S)	Business skills (B/S)
Establishment of own business	Performance motivation	Risk propensity	General management skills
Completion of first transactions		Creativity and innovation	Marketing skills
Growth in net value of business		Opportunity identification	Legal skills
Recruitment of employees		Role models	Operational skills
Increasing productivity levels			Human resources management skills
Increasing profitability			Communication skills
			Business plan skills
			Financial skills

Source: Adapted from Antonites (2003:41).

3.2.6.1 Performance Motivation (M)

"Economic circumstances are important; marketing is important; finance is important; even public agency assistance is important. But none of these will, alone, create a new venture. For that we need a person, in whose mind all of the possibilities come together, who believes that innovation is possible, and who has the motivation to persist until the job is done. Person, process, and choice: for these we need a truly psychological perspective on new venture creation" *(Naffziger, Hornsby & Kuratko, 1994:29).*

Wickham (2006:23) defines motivation as the ability to encourage an individual to take a particular course of action, and that it is based upon an understanding of drives and the ability to reward effort.

Gordon (1987:94) defines motivation in terms of Abraham Maslow's hierarchy of needs, starting with physiological needs, safety and security needs, a sense of belonging and love, esteem, and self-actualization. Self-actualization needs, which come closer to McClelland's need for achievement reflect what inherent motive drives a person towards attaining his or her full potential. Organizations try to motivate individuals who want the opportunity to be creative on the job, or who want autonomy and responsibility, by offering both challenging positions and opportunities to advance in the organization (Gordon, 1987:94).

In an effort to understand the role which motivation plays in entrepreneurship development, Antonites (2003:42) poses the following questions: What motivates an individual, a potential entrepreneur to commit wholeheartedly him/herself to the establishment and development of a business? What motive is involved in taking a personal risk in the process? Which motives distinguish the entrepreneur from the standard business person and what leads to the absolute striving towards independence as opposed to the security of a set salary and employment?

Antonites (2003:45) contends that the motivation of the entrepreneur becomes absolute when placed within the entrepreneurial performance perspective, integrating it as a driving force in the increase of entrepreneurial performance.

The majority of theoretical models for the study of entrepreneurial performance emphasize motivation as one of the key elements in the success of small businesses (Robichaud, McGraw & Roger, 2001:189). In their study, Robichaud *et al.* (2001:189) regard entrepreneurial motivation as objectives or goals that entrepreneurs seek to achieve through business ownership. These entrepreneurial objectives are presumed to determine the behavioural patterns of the entrepreneurs and, indirectly, the success of their business.

Referring to the theory of psychological motivation developed by McClelland (1961) and Atkinson (1964), Timmons and Spinelli (2007:5) posit that people are motivated by three principal needs, namely: the need for achievement, the need for power, and the need for affiliation. They define these as follows: the need for achievement is the need to excel and

for measurable personal accomplishment; the need for power is the need to influence others and to achieve an "influence goal"; and the need for affiliation is the need to attain an "affiliation goal" – for instance, the goal to build a warm relationship with someone else and/or to enjoy mutual friendship.

Timmons and Spinelli (2007:13) further opine that the successful entrepreneurs' desire to compete against their own self-imposed standards and to pursue and attain challenging goals, is achievement motivation in action. The authors argue that this type of entrepreneurs have a low need for status and power and rather derive personal motivation from the challenge and excitement of creating and building enterprises.

Murray (in Johnson, 1990:40) defines achievement motivation as"… the desire or tendency to do things rapidly and/or as well as possible. It also includes the desire: to accomplish something difficult; to master, manipulate and organize physical objects, human beings or ideas; to do this as rapidly and independently as possible; to overcome obstacles and attain a high standard; to excel one's self; to rival and surpass others; to increase self-regard by the successful exercise of talent". The constructs of performance motivation, entrepreneurial motivation and achievement motivation are interlinked as they all strive towards enhancing entrepreneurial performance, and therefore growth and profitability.

Johnson (1990:40) reports that McClelland's belief that achievement motivation could be increased resulted in the development of training programmes designed to increase achievement motivation in prospective and practising business managers. The aim would be to enhance the probability of business success and economic development. This is in tandem with recent literature on models of entrepreneurship development as a catalyst for job creation, economic growth and economic development.

Naffziger *et al.* (1994:32) contend that the decision to behave like an entrepreneur hinges not only on personal characteristics and individual experiences, but also on other factors such as the individual's personal environment; the relevant business environment; the specific business idea; and the goals of the entrepreneur. Whilst not disputing the behavioural-trait description of entrepreneurship, the authors, however, argue that as implied by previous models, entrepreneurship does not cease somewhere during the operation of the ongoing venture but goes beyond that.

Naffziger *et al.* (1994:31) take an expanded view of entrepreneurship which includes the entirety of the entrepreneurial experience – that is, behaviours that are necessary in the operation of the business, its performance, and the psychological and non-psychological outcomes which result from owning a business. In order to have this holistic view of entrepreneurship, the authors developed an integrative model (Figure 3.4), which moves beyond business start-up and addresses the factors that motivate an entrepreneur to stay with entrepreneurship as a career choice. According to this model, and notwithstanding the relevance of the other abovementioned antecedents to entrepreneurship, goal-setting by the entrepreneur is regarded as a key motivator for the entrepreneur to continue with the business beyond start-up, provided the prospects for success are there.

Naffziger *et al.* (1994:39) urge future researchers to not consider firm performance (and particularly traditional measures of performance such as financial performance) as a sole yardstick by which business owners evaluate the effectiveness of their businesses. They should also employ non-financial measures. The authors, however, caution that their model needs to be tested and validated in order to confirm the propositions advanced therein.

Figure 3.4: A model of entrepreneurial motivation

PC = Personal Characteristics
PE = Personal Environment
PG = Personal Goals
BE = Business Environment
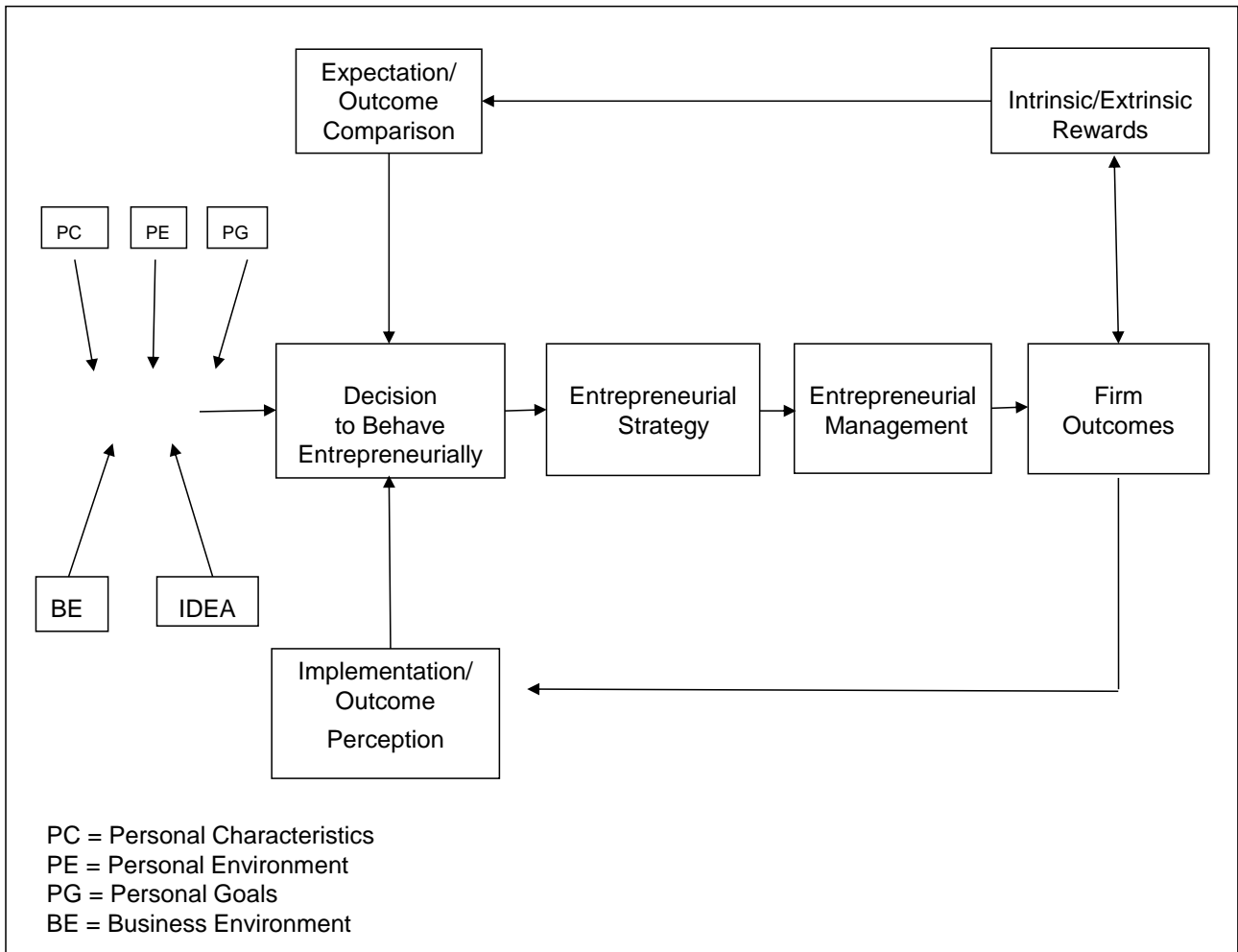
Source: Adapted from Naffziger, Hornsby and Kuratko (1994:33).

3.2.6.2 *Entrepreneurial skills (E/S)*

As indicated earlier, the focus of this study is the enhancement of entrepreneurship in the agricultural sector of Namibia by infusing entrepreneurial skills in farmers benefiting from the NRP and AALS schemes.

Antonites (2003:41) regards entrepreneurial skills as a manifestation of risk propensity, creativity and innovation, opportunity identification, and role models (as depicted in Table 3.2 above).

3.2.6.2.1 Risk propensity

In their study on time and entrepreneurial risk behaviour, Das and Teng (1997:69) assert that risk is intrinsically embedded in time, and that the way in which an individual conceptualises the flow of time in the future has a significant impact on entrepreneurial risk behaviour. The authors therefore propose a temporal framework that seeks to explain the different types of risk behaviour among entrepreneurs and their dispositions or propensity to risk.

Das and Teng (1997:70) define risk as substantial variances in outcomes. The authors assert that risk and uncertainty are embedded in time owing to their being "unpredictable futures" (Das & Teng, 1997:72). This is in line with the assertion that entrepreneurial risk results from the insecurity that exists since the success of market penetration can never really be determined beforehand, and can, therefore, be an innovation that produces unwanted outcomes (Antonites, 2003:58).

Entrepreneurial activities involve substantial investments, both financial and personal, therefore, a failure usually means enormous losses to the entrepreneur. Conversely, successful entrepreneurial attempts can bring much greater-than-usual wealth and personal fulfilment to the entrepreneur – for instance, the higher the risk, the higher the return (Das & Teng, 1997:70). The authors differentiate between two types of risk horizons, namely: short-term risk and long-term risk. Short-term risk behaviour is about taking or avoiding actions that may cause outcomes to vary significantly in the near future, from great gains to great losses; whereas long-term risk behaviour is concerned with taking or avoiding actions that may cause outcomes to vary significantly in the distant future (Das& Teng, 1997:72).

In this context, Das and Teng (1997:73) differentiate between short-term entrepreneurial risk and long-term entrepreneurial risk. They associate short-term entrepreneurial risk with what they term "sinking-the-boat risk", which signifies the possibility of the new venture failing owing to financial slack and back-up. Long-term entrepreneurial risk is associated with "missing-the-boat risk" because the opportunity cost of pursuing an entrepreneurial career is usually not realized until much later. The results, whether positive or negative, of such actions take much longer to materialise.

Hamid, Rangel, Taib and Thurasamy (2013:1) in a study on the current risk-taking behaviour of the Malaysian retail investors, found that risk-propensity was positively related to risk-taking behaviour, whereas risk perception was negatively related to risk-taking behaviour. The authors further found that risk perception partially mediates the effect of propensity to take risk. Risk perception is defined as an individual's assessment of the inherent risk in a given situational problem. Risk propensity may be seen from the perspective of a risk-averse behaviour versus risk-seeking behaviour (Hamid *et al*., 2013:3-5).

Hamid *et al*. (2013:2-3) conclude that the utility theory is the central tenet of the efficient market hypothesis with its concept of investor rationality leading to the assumption that investors select a portfolio that maximises their returns on investment whilst minimising their risks. Notwithstanding, the authors conclude that the tendency to engage in the above risk-taking behaviours is more psychological in nature rather than a product of imparting more education to individual investors (Hamid *et al*., 2013:10).

In the context of the current study on entrepreneurial performance in the agriculture sector it would seem imperative, based on the above claims on risk propensity, for regulatory authorities to strengthen information dissemination infrastructure on risk propensity as a crucial ingredient of entrepreneurial skills. The latter, may in turn, be an important factor in the enhancement of entrepreneurial performance in the agriculture sector.

3.2.6.2.2 Opportunity identification

Opportunity identification has been recognized as one of the most important abilities of successful entrepreneurs, and consequently has become an important element of the study of entrepreneurship. Understanding the opportunity identification process is critical, and the questions of why, when, and how some people are able to identify opportunities have attracted much interest (Shepherd & Tienne, 2005:91).

Timmons and Spinelli (2007:118) posit that opportunities are created, or built, using ideas and entrepreneurial creativity. The authors argue that ideas interact with real-world conditions or developments, resulting in opportunities around which new ventures can be created. A superior opportunity should possess the qualities of attractiveness, durability,

and timeliness. Furthermore, the product or service offered to the buyer or end-user should create or add value by solving a very serious problem (Timmons & Spinelli, 2007:118). Opportunities in the free market system usually present themselves where the situation is changing, including chaotic situations (Antonites, 2003:120).

Whilst Shepherd and Tienne (2005) may have explored the phenomenon of opportunity identification from the perspective of prior knowledge and financial reward as antecedents, they, however, acknowledge that there are other factors such as entrepreneurial alertness, social networks, and entrepreneurial cognition which can play a similar role. The authors conclude that a higher potential financial reward results in the identification of a greater number of opportunities, and that the level of an individual's prior knowledge had bearing; thus increasing the number of opportunities identified and the innovativeness of those opportunities (Shepherd & Tienne, 2005:106).

Shane and Nicolaou (2014:1) explored the effect of having a creative personality as a factor in opportunity identification. The authors confirmed that people with creative personalities are more likely to identify opportunities and start businesses than people without creative minds. However, it can be argued that opportunity identification is not necessarily a function of a creative personality, but that the relationship between creativity and entrepreneurship may emanate from situational, contextual and cognitive factors (Shane & Nicolaou, 2014:3). St-Jean (2011b:39) asserts that social capital in the form of networks and social interaction enables entrepreneurs to collect information which helps them to identify entrepreneurial opportunities.

3.2.6.2.3 Role models

Bosma, Hessels, Schutjens, Van Praag and Verheul (2012:410) report that many entrepreneurs claim that their decisions to start businesses and development of their businesses have been influenced by others, and these others are entrepreneurs who may range from the likes of Steve Jobs to former colleagues or family members. These are essentially role models. Bosma *et al.* (2012:410) define role models as individuals who set examples to be emulated by others and who may stimulate or inspire other individuals to make certain (career) decisions and achieve certain goals.

Antonites (2003:60) exemplifies the important role that role models can play in the career choice of a person. The author contends that, in the entrepreneurial context, observing another person being successful in business has a motivating influence on the potential entrepreneur, and that, may drive this potential entrepreneur to perform even better than the role model.

Scherer, Adams, Carley and Wiebe (1989:53), in their study on the effects of role model performance on the development of entrepreneurial career preference, conclude that the presence of a parent role model is associated with increased education and training aspirations, task self-efficacy, and expectancy for an entrepreneurial career. The authors argue that whilst theoretically anyone can serve as a role model for a child, the family in general and parents in particular are especially likely to be role models since they are a major source of socialization for the child. In other words, their proximity will have a greater bearing on the growth and learning orientation of the child than a distant family member or anyone else.

Drawing on Social Learning Theory, which purports that learning can occur through the observation of behaviours in others, Scherer *et al.* (1989:55) assert that an individual is more likely to express a preference for a particular occupation or career if that individual has observed a model perform activities associated with that career or occupation successfully. In essence, the authors opine that preference for an entrepreneurial career is enhanced by exposure to a parent who is perceived to be a high performer, just as an observation of a low performing parent would generally decrease preference for that career, as would absence of a role model (Scherer *et al.*, 1989:56).

Bosma *et al.* (2012:413) list four interrelated functions which entrepreneurial role models may perform, as follows:

(i)   inspiration and motivation – the role model creates awareness and motivates people to get started,

(ii)   increasing self-efficacy – the role model boosts people's confidence; making them capable of achieving a certain goal,

(iii)   learning by example – the role model provides guidelines for action, and

(iv)   learning by support – the role model provides hands-on support or advice.

In substantiation of the above, Barnir, Watson and Hutchins (2011:277) assert that not only do role models provide potential entrepreneurs with opportunities to identify and engage in entrepreneurial activities, but through the formal and informal exchange of knowledge and support, they help them develop the necessary skills to excel and engage successfully in entrepreneurial events. Notwithstanding, perceptions exist that the lack of role models impact more negatively on the career progression of women rather than that of men (Barnir *et al.*, 2011:277).

Recognizing the increasingly important role that role models are said to play in determining career choice and outcomes, educational institutions around the globe have involved "icon" entrepreneurs on a much bigger scale in their educational programmes with the aim of motivating, inspiring and supporting entrepreneurship among pupils and students. The issue of "strong ties" relationships in the form of former colleagues and employers is critical in enhancing the mentoring function for entrepreneurship and entrepreneurial performance (Bosma *et al.*, 2012:421; 422).

In the context of this study, role models are recognised as critical players in entrepreneurial development from a support tool perspective and should be acknowledged as such.

3.2.6.2.4 Creativity and Innovation

The word "creativity" is derived from the Latin root *creare*, which means to produce – thus creating something new (Antonites, 2009:56). The author regards creativity as the catalyst for all new creations – from invention to innovation and implementation. In the author's view, it is the thought process that leads to the development and generation of ideas. The 4P model of creativity (Figure 3.5 below) is the basis for entrepreneurial creativity.

It depicts the person, the process, the product, and the press (environment). According to this model, the person, as represented by the brain, is the main factory in the creative act. The creative process involves initially, generating an idea; followed by an invention which involves moulding the most suitable or feasible idea; and subsequently, commercializing the invention. The product is the culmination of the process elucidated above (Antonites,

2009:57-65). The press depicts all the environmental barriers to creativity, be it perpetual, cultural, physical and psychological/intellectual barriers (Antonites, 2003:151).

Sarri, Bakouros and Petridou (2010:273) regard creativity as the act of identifying a problem and generating ideas to resolve such problem. Phan, Zhou and Abrahamson (2010:181) define creativity as the engine that drives entrepreneurial discovery owing to its focus on idea production. The authors point to the more recent categorisation or description of creativity as a meta-construct comprising individual differences, social and resource networks, and team dynamics. The entrepreneur, therefore, has to convince others that his or her ideas are worth the support of other resource providers. Moreover, the results of such creativity impact on the social network of the entrepreneur (Phan *et al.*, 2010:183).

The 4P model of creativity

Figure 3.5: The 4P model of creativity
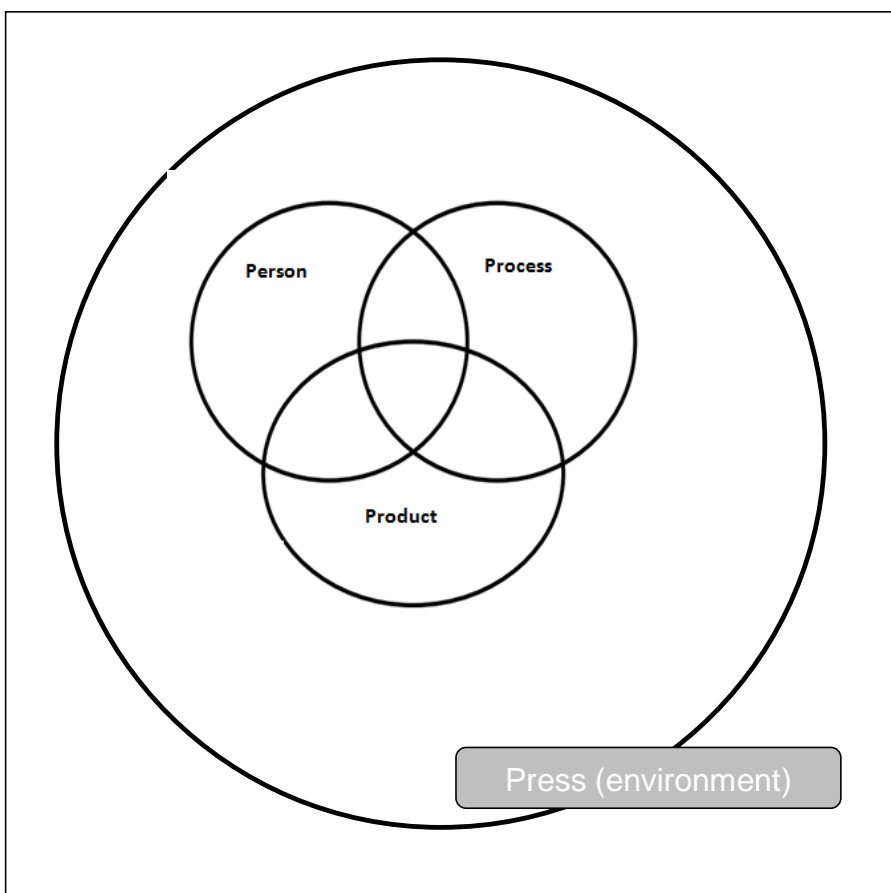
Source: Adapted from Antonites (in Nieman and Nieuwenhuizen (2014:57).

A more recent perspective from Shane and Nicolaou (2014:2), states that when compared with others, people with creative personalities are more likely to identify new business opportunities and to start businesses as well. The authors also found that genetic factors account for part of the correlation between creative personality and entrepreneurial behaviour. A theory exists that people can be creative without having a creative personality depending on the context in which entrepreneurship occurs. Situational, contextual and cognitive factors, rather than individual factors related to personality, may give rise to the association between creativity and entrepreneurship (Shane & Nicolaou, 2014:3).

Shane and Nicolaou (2014:11) agree that all entrepreneurs need some level of creativity when identifying an opportunity, conceptualizing new ideas, being creative in securing venture capital funding, or selling their ideas to potential investors.

Smith (2006:6) defines innovation as bringing inventions out of the workshop or the laboratory and getting them ready for the market. According to the author, inventions only become innovation when something new is available to consumers in the market or is being produced in a new way.

Antonites (2003:109) regards innovation as the practical implementation of the idea or concept (invention) to ensure that the set aims on a commercial, profitable basis are met, and correlate with a specific opportunity in the market environment. The author, in line with Smith (2006), sees innovation as being the creation of ideas that seem to be newer, faster, cost effective and possibly more aesthetical (Antonites, 2003:109).

Thornhill (2006:689) regards innovation as a process that begins with an idea, proceeds with the development of an invention, and results in the introduction of a new product, process or service to the marketplace. Snoj, Milfelner and Gabrijan (2007:153) argue that organizations with greater capacity to innovate are better at developing and launching successful new products and services in comparison with their competitors. Thornhill (2006:689) accentuates the preceding argument by classifying an entrepreneurial firm as one that engages in developing new products, new processes, new services, and in finding new markets through innovation. In addition, an entrepreneurial firm undertakes risky ventures, and is first to come up with proactive innovations, making it more competitive.

According to Sarri *et al.* (2010:270) the term innovation originates from the Latin word "innovare" which means "to make something new". Nowadays, however, the broader definition in use includes all activities of the process of technological change such as problems of awareness and definition, the development of new ideas and new solutions for existing problems, the realization of new solutions and technological options, and the broader diffusion of new technologies (Sarri *et al.*, 2010:273). In the final analysis, the authors regard innovation as idea selection, development and commercialisation. Phan *et al.* (2010:181) posit that innovation focuses on the implementation of new and useful ideas.

The shift which occurred in developed countries from industrial economy to knowledge economy means that the optimal exploitation of an organization's intellectual capital and its ability to be continuously creative and innovative appears to be the new battle ground which presents great challenges to all enterprises the world over (Sarri *et al.*, 2010:271).

3.2.6.3 Mentorship

From an entrepreneurial context, St-Jean (2011b:38) defines mentoring or mentorship as a support relationship between a novice entrepreneur (named mentee) and an experienced entrepreneur (named mentor), where the latter helps the former develop as a person. This happens by pairing up a novice entrepreneur with an experienced entrepreneur who provides counselling in terms of strategic thinking and decision-making in order to avoid the mentee making costly mistakes (St-Jean & Audet, 2012:122). Drawing on literature on mentoring in large organizations, St-Jean (2011a:65) highlights the following as three main categories of functions that the mentor exerts on the mentee:

(i)   psychological functions which encapsulate: reflector (mentor reflecting the image the mentee projects to others), reassurance (mentor reassures the mentee during difficult times), motivation (mentor motivates and encourages the mentee), and confidant (mentee confides in the mentor);

(ii)   entrepreneurial career-related functions which encompass: integration (mentor presenting/introducing mentee to the business community as a way of networking), information support (mentor gives the mentee relevant and useful information for

business development), confrontation (mentor confronts the mentee's ideas in a problem-solving context, and guidance (mentor helps the mentee improve comprehension and suggests solutions); and

(iii)   role model function (mentor as a source of inspiration, or at least, of comparison).

In the context of this study, mentorship could play a vital role by getting experienced farmers to transfer skills to, and to exchange information with novice- and emerging farmers. These, could, in turn, assist them with their farming operations in an entrepreneurial and profitable manner.

3.2.7   A model for entrepreneurship development (Nieuwenhuizen & Nieman, 2014)

Nieuwenhuizen and Nieman (2014:10) recognize the important role which the external environment plays in the development of entrepreneurship and entrepreneurs. The authors emphasize the need for critically evaluating the influence which the external environment or business environment exerts in this process.

Nieuwenhuizen and Nieman (2014:11-13) list entrepreneurial orientation, supportive environment and cooperative environment as important factors bearing on the development of entrepreneurship in any given country. Figure 3.6 depicts their model for entrepreneurship development. In terms of this model, entrepreneurial orientation is important during the entrepreneurial process at the level of society. According to the authors, the construct of entrepreneurial orientation is fostered by a unique blend of factors such as culture, family and role models, education, work experience and personal orientation. Culture is regarded as having an influence on how entrepreneurship is fostered in a given society. In some cultures, like those in the United States, entrepreneurs are recognized and celebrated. In other cultures, however, an example being Russia in the past, entrepreneurs were regarded as criminals, as was indicated in chapter two.

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CHAPTER 3
**CONCEPTUAL FRAMEWORKS AND MODELS ON ENTREPRENEURSHIP AND
AGRICULTURE DEVELOPMENT**

Figure 3.6: A model for entrepreneurship development

- Economic growth occurs
- Incomes increase
- Living standards improve
- Investment opportunities arise
- Tax base is enlarged by a greater number of new firms
- Technological development occurs
- Job opportunities arise
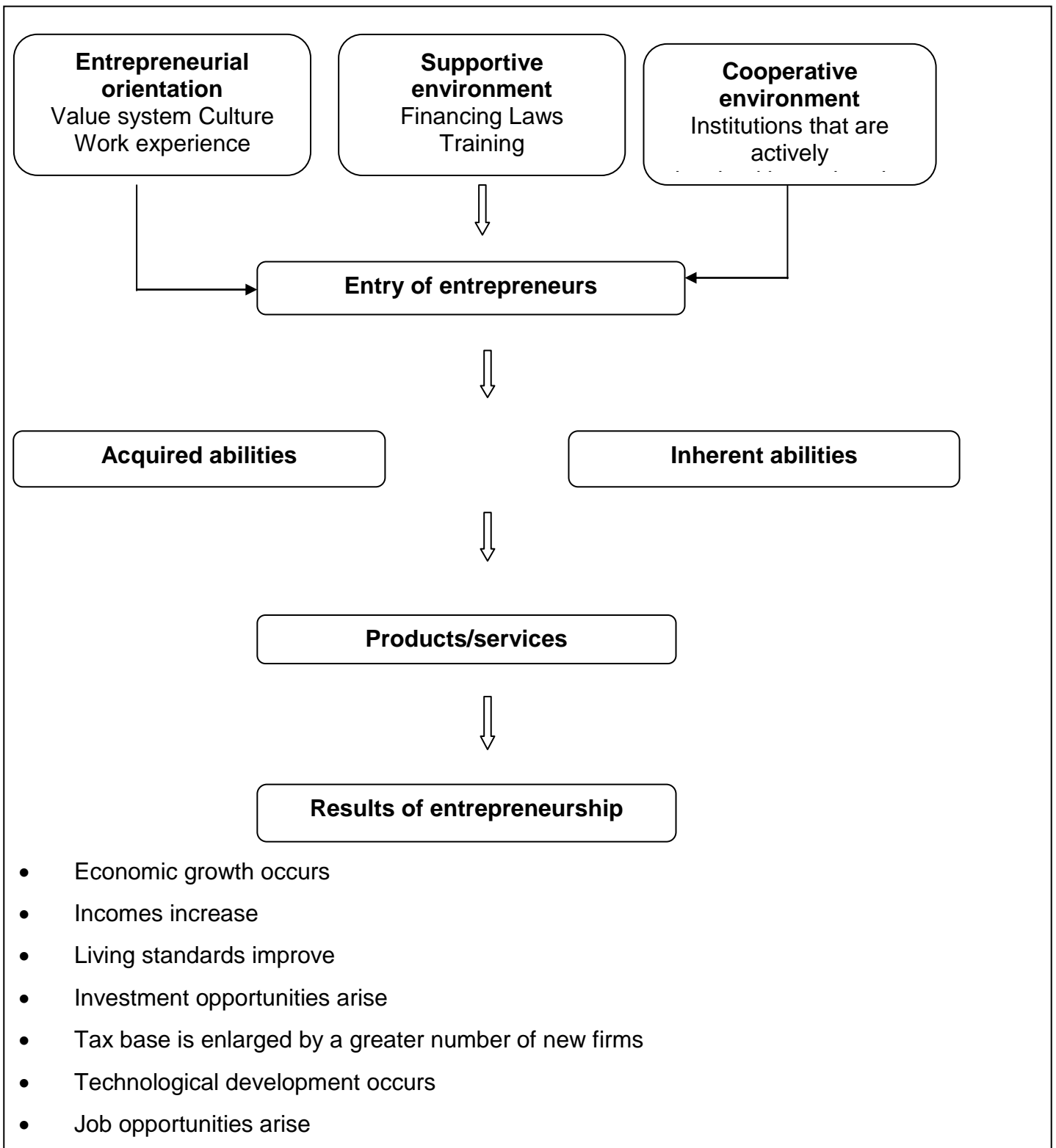
Source: Adapted from Nieuwenhuizen and Nieman (2014:13)

Similar to Scherer *et al.* (1989) above, Nieuwenhuizen and Nieman (2014) regard family members and other role models as having an influence on people taking up a career in entrepreneurship. Children who grow up in families where family members are

entrepreneurs are more inclined to start their own businesses or become involved in the family businesses (Nieuwenhuizen & Nieman, 2014:12). The authors emphasize the critical important role of tertiary education in the development of entrepreneurship by providing valuable additional entrepreneurial capacity.

Nieuwenhuizen and Nieman (2014:12) further posit that work experience contributes to the entrepreneurial orientation of the individual, and knowledge and skills gained in their businesses. With regard to personal orientation, they list the following as dimensions of entrepreneurial orientation which influence an individual's career orientation: creativity and innovation (experimentation); autonomy (independence); risk taking; pro-activeness (taking initiative, and pursuing and anticipating opportunities); and competitive aggressiveness (achievement oriented).

Nieuwenhuizen and Nieman (2014:12-13), point to the catalytic role that the supportive environment plays in the development of entrepreneurship and entrepreneurs. According to the authors a number of barriers hinder the creation of an enabling environment conducive to entrepreneurship. These include lack of infrastructure in terms of roads, electricity, water, and telecommunication networks; lack of deregulation of certain economic activities to create opportunities for private enterprise; restrictions of free trade areas; over-abundance of legal regulations and rules. Training and development; financial services and financing schemes; business advice; counselling; mentoring and incubators are some of the critical services which should be fostered for entrepreneurship development (Nieuwenhuizen& Nieman, 2014:13).

In addition to the supportive environment, the authors advocate for the enhancement of a cooperative environment in which universities and other educational institutions help nurture an entrepreneurial culture by introducing programmes in their curricula which encourage and develop entrepreneurs and entrepreneurial orientation. The authors also implore large firms and non-governmental organisations to play this cooperative role through their social responsibility programmes by funding research in entrepreneurship, and sponsor specific entrepreneurship interventions in previously disadvantaged communities (Nieuwenhuizen& Nieman, 2014:13).

The above model anticipates that the successful development of entrepreneurship has the following benefits such as economic growth; increased incomes; improved living

standards; investment opportunities; enlarged tax base owing to a greater number of new firms; technological development; and increased job opportunities.

As in some of the models presented above (Gnyawali & Fogel, 1994; Lado & Vozikis, 1996; Antonites, 2003), this model concludes that factors such as the external environment, technology, role models, education, supportive government regulations, and innovation are all central to the development of entrepreneurship and entrepreneurs.

3.2.8 A situated metacognitive model of the entrepreneurial mindset (Haynie, Shepherd, Mosakowski & Earley, 2010)

Haynie *et al.* (2010:217) develop a model to investigate the foundations of an entrepreneurial mindset, which scholars describe as the ability to sense, act, and mobilise, even under uncertain conditions. The authors focus on metacognitive processes that enable the entrepreneur to think beyond or re-organise existing knowledge structures and heuristics, promoting adaptable cognitions in the face of novel and uncertain decision contexts.

In the context of entrepreneurship, cognition is taken to be the knowledge structures (heuristics) that people use to make assessments, judgements, or decisions involving opportunity evaluation, venture creation, or venture growth. Metacognition describes a higher-order process that reflects one's awareness and control over the knowledge structures that are employed to make assessment, judgements and decisions. Cognitive adaptability is defined as the ability to be dynamic, flexible and self-regulating in one's cognitions under dynamic and uncertain environments (Haynie *et al.*, 2010:218,220). Adaptable cognitions are important in achieving desirable outcomes from entrepreneurial actions.

The situated metacognitive model of the entrepreneurial mindset is depicted in Figure 3.7 below.

Figure 3.7: A situated metacognitive model of the entrepreneurial mindset
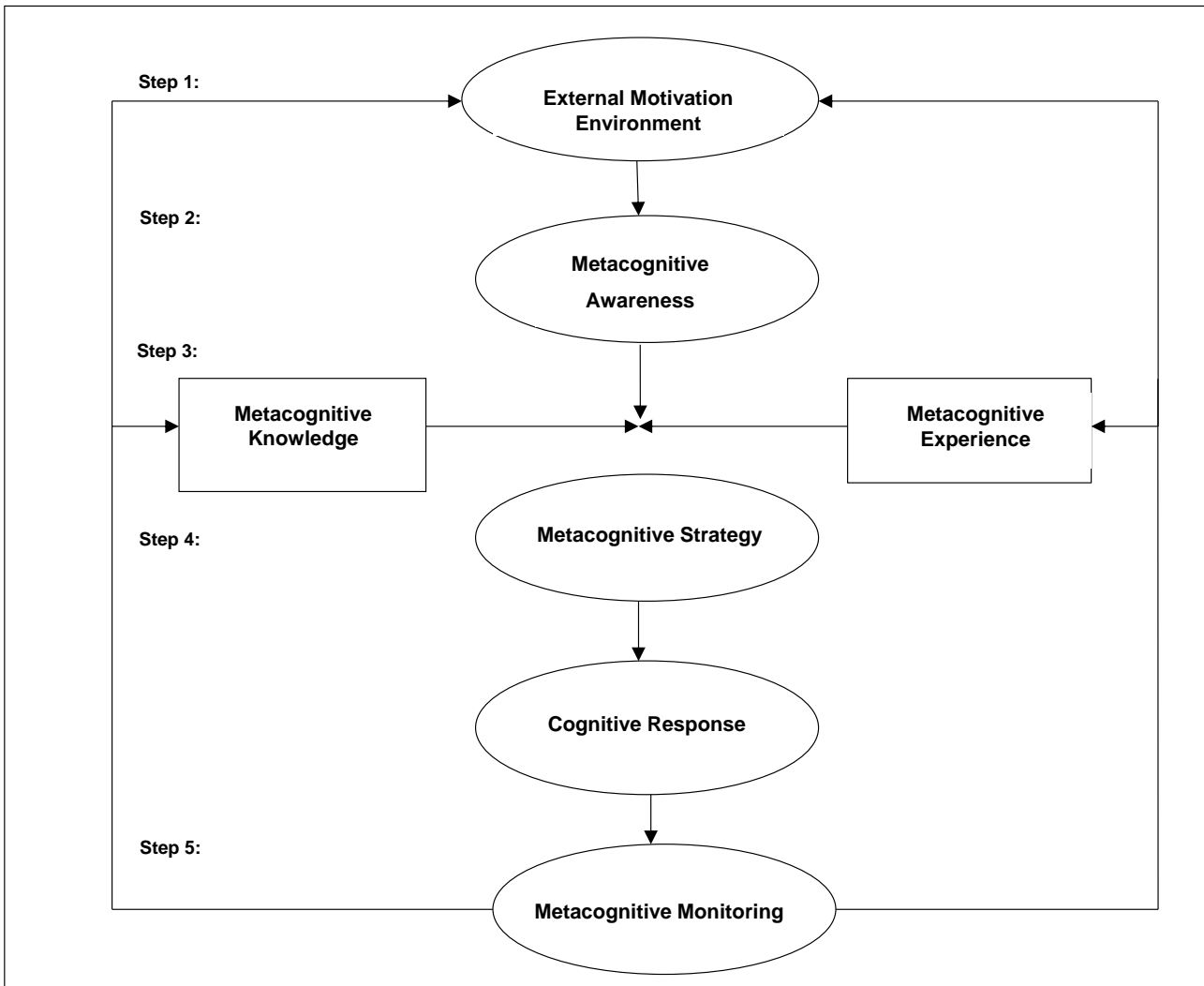
Source: Adapted from Haynie *et al.* (2010:220).

The model consists of five steps namely:

Step 1: the interaction of the environment and entrepreneurial motivation – which activates metacognitive processing.

Step 2: metacognitive awareness – represents a general level of awareness one has concerning their own cognitions focused on a specific entrepreneurial task such as discovering, evaluating, and exploiting opportunities.

Step 3: metacognitive resources (metacognitive knowledge and metacognitive experience) – knowledge and experience that relate to formulating a strategy to process the task at hand.

Step 4: metacognitive strategy – the framework formulated by the entrepreneur through which to evaluate multiple alternative responses to processing the entrepreneurial task.

Step 5: metacognitive monitoring – serves to inform how an entrepreneur perceives the interaction between his or her environment and motivations both across and within cognitive endeavours (Haynie *et al.*, 2010:221-223).

The situated metacognitive model of the entrepreneurial mindset offers insights into numerous outcomes and situations which are fundamental to the study of entrepreneurship comprising opportunity recognition; entrepreneurial action; new venture creation; and firm growth.

In the context of this study, the metacognitive model provides a platform for instilling in potential agricultural entrepreneurs the ability to adapt and be flexible in thinking in the face of uncertain, complex and dynamic entrepreneurial environments.

3.2.9 Successful entrepreneurship as developmental outcome: a path model from a lifespan perspective of human development (Obschonka, Silbereisen & Schmitt-Rodermund, 2011)

Obschonka *et al.* (2011:174) apply a lifespan approach of human development to examining pathways to entrepreneurial success by analysing retrospective and current data. Drawing on the Schmitt-Rodermund's developmental model which focuses on adolescence, and the Giessen-Amsterdam model which follows a cross-sectional approach targeting adults' mindsets, the authors investigated the roles of founders' adolescent years (early role models, authoritative parenting, and early entrepreneurial competence), personality traits, entrepreneurial skills and growth goals during venture creation (Obschonka *et al.*, 2011:175). The path model is depicted in Figure 3.8.

According to this model, entrepreneurial skills and growth goals during venture creation should firstly, predict entrepreneurial success, and secondly, entrepreneurial skills should predict growth goals.

Finally, an entrepreneurial Big Five profile should predict entrepreneurial skills. The authors applied SEM to test the hypothesized model. This was preceded by a confirmatory factor analysis to test the measurement model.

The study found that:

- A person's entrepreneurial success is associated with entrepreneurial skills that are present when starting own business.

- Entrepreneurial skills seem to be linked with both early developmental periods and dispositional personality traits.

- Parental style and early role models had an effect on early entrepreneurial competence.

- Successful entrepreneurial careers can be fostered early in life by targeting early entrepreneurial competence.

- Moreover the study concludes that it is important to understand a person's entrepreneurial success as a developmental outcome.

In the context of the present study, Obschonka's *et al.* (2011) path model provides useful insights into successful entrepreneurship, and some of the concepts and constructs may be utilised in the proposed model of agricultural-entrepreneurial development.

Figure 3.8: Successful entrepreneurship as developmental outcome
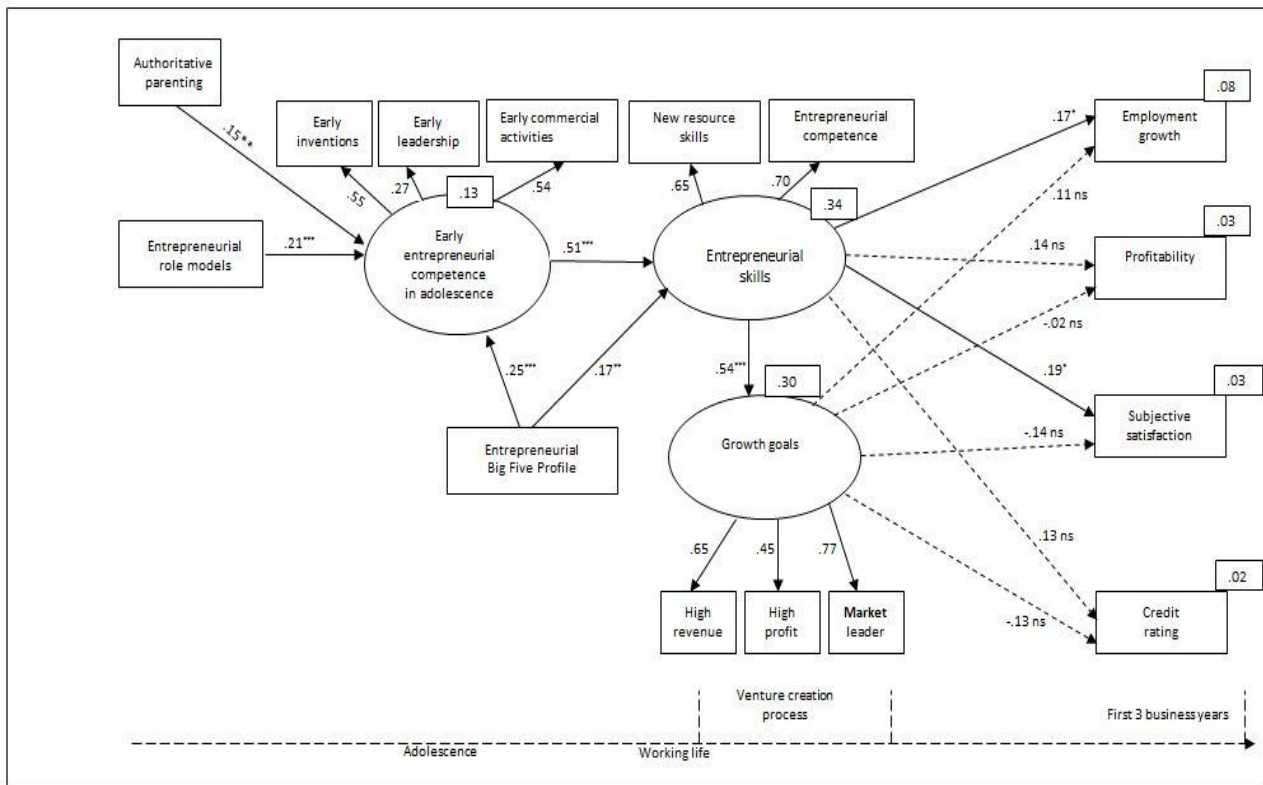
Source: Adapted from Obschonka *et al* (2011).

3.2.10 A conceptual framework for entrepreneurship education policy: meeting government and economic purposes (O'Connor, 2013)

Whilst there is an increasing tendency for government policy to promote entrepreneurship, through entrepreneurship education, to spur on economic growth and development, a theoretically-sound conceptual grounding assisting policy-makers and educators to locate a programme within specific objectives, is lacking (O'Connor, 2013:546). O'Connor proposes a policy framework using the Australian government policy context in this regard as a reference point. For this purpose, a definition of entrepreneurship is adopted which describes it as a social process that involves the efforts of individuals in enterprise activity, hence moving away from referring to business start-up specifically. Enterprise here is referred to as the introduction of new products, services, processes, and materials that result in market disruption, in the Schumpeterian view (O'Connor, 2013:547-548).

The proposed policy framework is embedded in four propositions that may prove useful in directing entrepreneurship education toward more defined practices at micro-level which

will ultimately contribute to macroeconomic purposes. The four propositions are outlined as follow:

Proposition 1: Policy-makers should differentiate the economic development and utility functions of the entrepreneur and enterprise from the business owner/manager and business with its productivity function.

Proposition 2: Policy-makers should design an entrepreneurship education policy that fosters the introduction of programmes for entrepreneurship in the knowledge, corporate or social sectors with the aim of achieving economic development, productivity or utility, respectively.

Proposition 3a: Policy-makers should support and encourage the provision of entrepreneurship education as a means to connect new ideas, technologies and new applications of knowledge to business formation and expansion, when aspiring to influence economic growth.

Proposition 3b: Policy-makers should support and encourage the provision of entrepreneurship education to entrepreneurship co-contributors who assist and facilitate the connection of new ideas, technologies and new applications of knowledge to business formation and expansion in relevant sectors of the economy, when intending to influence economic growth.

Proposition 4: Policy-makers should ensure that entrepreneurship education emphasizes effectual and strategic reasoning that optimises sustainable business creation and survival over causal reasoning that optimises business productivity.

The above approach encapsulated in propositions links entrepreneurship education to economic- and market-level outcomes rather than simply business start-up or the development of entrepreneurial attitudes and intentions (O'Connor, 2013:557-559).

The study highlights new thinking and/or perspectives in entrepreneurship education policy. These include, inter alia, that the focus be directed toward different economic outcomes; that the dominant association of entrepreneurship with business start-up be challenged by super-imposing specific economic purposes on entrepreneurship education; that the somewhat blurred relationship or association between entrepreneurship and the

broader concept of business be clarified; and that the government play a role in clarifying the economic purpose of entrepreneurship education.

The section, which follows, examines current frameworks and models on agriculture development.

3.3 CONCEPTUAL FRAMEWORKS AND MODELS ON AGRICULTURE DEVELOPMENT

It is apparent from studies conducted on land reform in Namibia (Ministry of Lands and Resettlement, 2010; Werner & Odendaal, 2010) that its implementation has not yielded the desired results, and many farmers who have been resettled on government-purchased farms have not been able to use the land allocated to them productively. Hence no noticeable improvement in their livelihoods has occurred, particularly for the NRP farmers.

3.3.1 Business models in land reform (Lahiff, 2007)

In the context of land reform in South Africa, Lahiff (2007) aims at first identifying the types of business models emerging within land reform, and subsequently analyses how they have been implemented, highlighting the implications for sustainable development and poverty alleviation. The author reports that the vast majority of restitution projects have not achieved their intended aims. Of the 128 projects with agricultural developmental aims, 83 per cent have not achieved these aims (Lahiff, 2007:1).

Lahiff (2007:3) identifies four broad models of land-use which cut across the various economic sectors of agriculture, forestry, tourism, conservation and mining. These are:

(i)   Individual (or household) access to land, typically for small-scale agricultural production and natural resource harvesting.

(ii)   Group access to, or control of, land (by either the entire communal property institution (CPI) or a sub-group within it), typically for large-scale agricultural production or tourism activities.

(iii)   Joint ventures with external parties (that is, non-members of the CPI), to engage in a range of agricultural or tourism activities.

(iv)   Contractual arrangements with external parties, whereby effective control of some or all of the resource is handed over for a specific period of time, with little or no direct involvement by the CPI members, in return for some form of payment (for example, rental and share of profits).

Lahiff (2007:4) argues that the individual or household model of land reform has the advantage of allowing immediate access to land, and thus to livelihood benefits, for those members who desire it, without being dependent on other members of the community. It could also reduce the need for collective decision-making regarding access to resources, organization of production, payment of bills and distribution of benefits which are proving immensely complicated and controversial in many land reform projects (Lahiff, 2007:4). The author states that, notwithstanding these advantages, the individual model has been strongly discouraged and is absent in the vast majority of settlement agreements and business plans.

As for the group access model of land reform, Lahiff (2007:6) contends that this has been the most popular and preferred route by the beneficiary community themselves, in which outsiders hardly feature. The author further highlights that agriculture is the most common type of land-use within land reform. It is also the most likely type for claimants to approach as a group, given that the land involved is predominantly rural and the beneficiary groups are dominated by rural people who have rudimentary education and skills, and therefore a greater need to acquire food and income. Lahiff (2007:6-8) however, points to the challenges of the group access model, particularly in terms of lack of business planning, coordination and organization among claimant communities, and the resultant minimal impact on livelihoods and poverty.

With regard to joint ventures, Lahiff (2007:8) opines that they offer a number of advantages to new entrants in the agricultural sector, particularly in terms of access to capital, expertise and markets. The author cautions that this type of model of land reform may present challenges relating to sharing of profits and loss of autonomy, independence or locus of control. According to Lahiff (2007:8), joint ventures are mainly agreements between commercial companies (or other institutions) and individuals who are prepared to

commit certain amount of resources to the venture and be held contractually responsible for their side of the agreement.

In terms of the contractual agreement model of land reform, of which strategic partnership is one, the intended beneficiary is not directly involved in production on the land in question (Lahiff, 2007:12). The claimant community and the strategic partner form an operating company in which farm workers are given a small share through a special farm workers' trust. A shareholders' agreement and a lease agreement entered into between the parties set out the operations of the operating company (Lahiff, 2007:12). This form of arrangement allows the strategic partner to take full control of the day-to-day management of the operating company, including its financial and operational matters. The downside of strategic partnerships in the context of land reform in South Africa is that, while it is likely that the objectives of land reform, in terms of the symbolic return of land to its rightful owners may be achieved, it does not necessarily translate into farm employment, material benefits for communities, and effective land rights for individual members (Lahiff, 2007:13).

The main aspects that come out of the study by Lahiff (2007) in relation to business models in land reform in South Africa may be summarised as follows: realistic assessment of community needs including socio-economic status, skills, current livelihood activities, and short- and long-term aspirations; capacity building within communities in terms of leadership skills, promotion of effective and accountable leadership, and participatory decision-making; development of a variety of land-use options, ranging from low-risk, low-investment, low-return to high-risk, high-investment, high-return options; and greater attention to the distribution of benefits in terms of land access, cash income and employment opportunities.

In the context of this study, the above business models hold lessons on the design and implementation of land reform projects for sustainable development.

3.3.2 The need for models of agricultural development (Hirooka, 2010)

Hirooka (2010:411) reports that systems approach techniques have been applied to modelling production systems in agriculture. The author discusses the merits of a system approach when compared with a traditional experimentation approach. Figure 3.9

illustrates the relationship between the systems approach and the traditional research method. The author is of the view that the system approach can assist in the organization of information and identification of gaps in knowledge and thereby open an avenue to multi-disciplinary research projects.

The author also points to the advantage of applying computer simulation techniques in the systems approach as opposed to conventional real-life experimentation. One of the advantages is that the environment can be controlled by changing the exogenous variables (input variables) and model parameters, hence providing information which cannot be obtained from real-life experimentation (Hirooka, 2010:412).This author is reviewed owing to his claims that a need for models applying the systems approach to agricultural development as opposed to those adopting the traditional experimentation approach, exists.

Figure 3.9: Illustration of the relationship between the systems approach and the traditional research approach
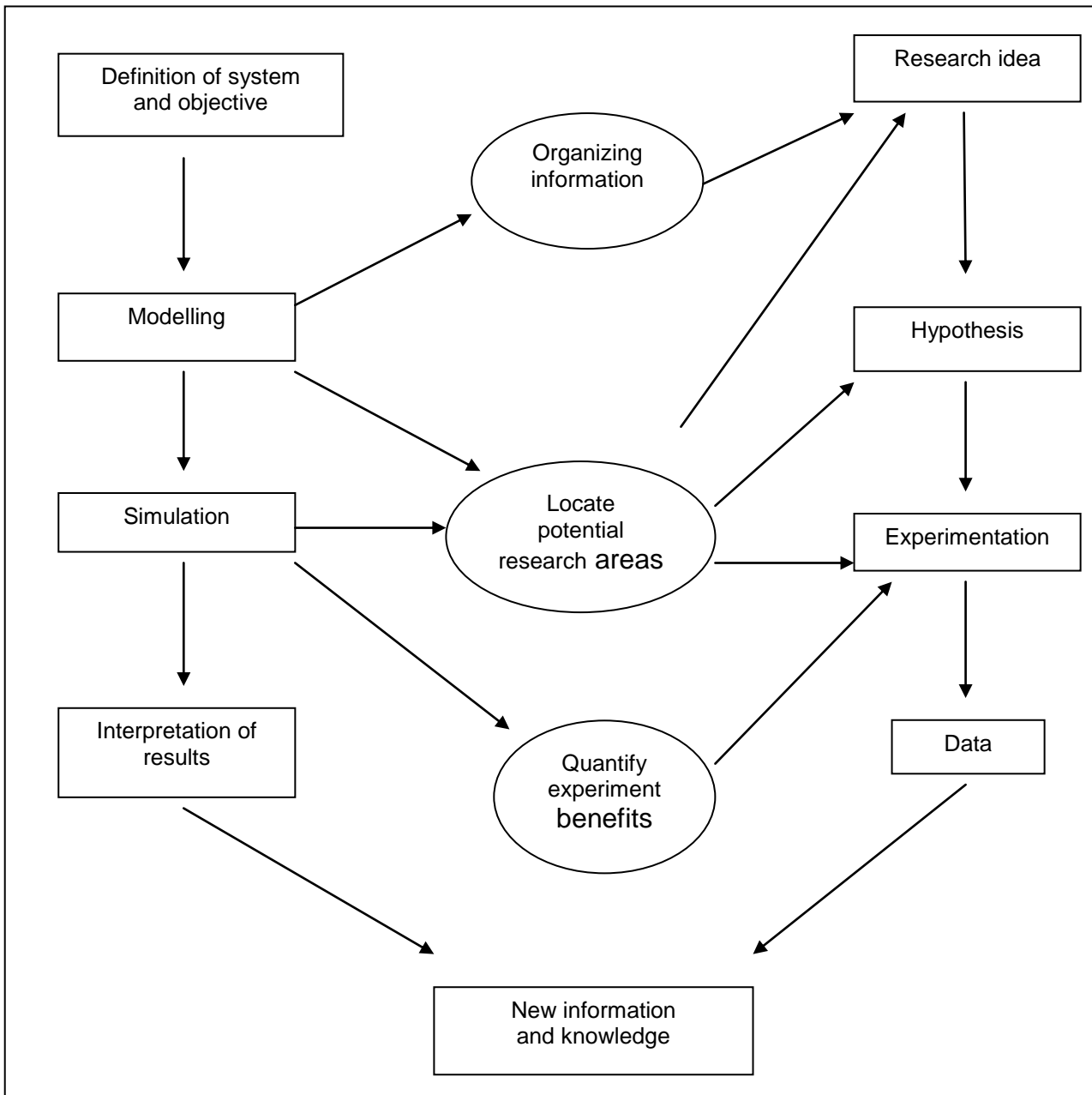
Source: Adapted from Hirooka (2010:420).

The main concluding features of the study by Hirooka (2010) are the advantages of modelling over traditional research approach, implying that: modelling can complement traditional research methods (i.e. experimentation) in terms of incorporating large amounts of data in existing knowledge, and provide a framework for making a research programme. Modelling projects can also sometimes stimulate multidisciplinary research in that a group of experts may be required to cover all aspects of a problem. Therefore, modelling has value both as a teaching- and a research tool.

3.3.3 Combining top-down and bottom-up modelling approaches in land use/cover change (Castella, Kam, Quang, Verburg & Hoanh, 2007)

Castella *et al*. (2007:531) opine that the controversy of integrated management of natural resources from local- to regional scales presents an opportunity for reconciling top-down and bottom-up approaches in land use/cover change (LUCC) modelling in agricultural research. The authors apply three modelling methodologies belonging to these two LUCC approaches in the province of Bac Kan in northern Vietnam, and aim to evaluate their utility for land use analysis and planning critically.

The province of Bac Kan was chosen primarily because it is one of the poorest provinces relying mainly on subsistence agriculture, and as such provides a challenge in terms of research on poverty alleviation. Furthermore, it has the attention of policy makers on difficult issues such as rampant shifting cultivation practices, population pressure, and risk of environmental degradation; manifesting itself in soil erosion and the depletion of natural resources owing to deforestation. Ultimately, the expectation is that local authorities and communities would be easily mobilized around these important environmental issues (Castella *et al*., 2007:532)

Mindful of the fact that no single research tool would be able to address all interrelated issues of sustainable management of natural resources, three different methodologies for LUCC analysis are the following:

(i)   The SAMBA

The model's name comes from SAM, the French acronym for agrarian systems and the name of the project in which the methodology was developed, and BA, which means "three" in Vietnamese. SAMBA was developed to understand the mechanisms of land use change particularly in the context of transition from centrally-planned to family-based agriculture in the 1980s at the village scale. Scenarios of land change are constructed by researchers and local stakeholders in a participatory manner using multi-agent models and role playing games.

(ii)   The LUPAS

The land use planning and analysis system (LUPAS) represents the latest generation in a long tradition of land use models based on land evaluation and use optimization with linear programming.

(iii)   The CLUE

The conversion of land use and its effects (CLUE) model is based on a combination of empirical analysis of the (proximate) driving factors of land use and the dynamic modelling of completion and land use dynamics.

LUPAS and CLUE analyse in a top-down manner whereas SAMBA analyse in a bottom-up manner (Castella *et al*., 2007:533-534).

The three main lessons learned are that: more than tool/method is needed to address the different aspects of eco-regional analysis and to address different stakeholders' issues at different scales, because no single method can capture all levels adequately; more integration between methods is required in order to enhance interaction between the different groups; and methodological development should focus on the complementarities of the approaches rather than on the models themselves (Castella *et al*., 2007:543).

In the context of this study, the above provides insights into approaches for land-use and land-planning modelling.

3.3.4   A conceptual model of smallholder agricultural commercialization for income growth and poverty alleviation in Southern Africa (Zhou, Minde & Mtigwe, 2013)

Zhou *et al.* (2013:2599) explores the concept of smallholder agricultural commercialization by highlighting cases from Southern Africa. The authors contemplate that, with most of Southern Africa's rural poor primarily depending on agriculture for livelihoods, shifting production from current subsistence towards market orientation (commercializing) can significantly increase the income and welfare of small farmers (smallholders) and contribute to economic growth and poverty alleviation (Zhou *et al*., 2013:2600).

Acknowledging the lack of models for agricultural entrepreneurship, especially for smallholders, the authors emphasize the need for future research to define commercialization comprehensively and develop models which stimulate multi-stakeholder support for smallholders, joint investments, attitude change and entrepreneurship to succeed in smallholder commercialization (Zhou *et al.*, 2013:2599).

Zhou *et al.* (2013) synthesize the key elements of agricultural commercialization and highlight experiences in Southern Africa to assist in understanding the concept, its application and future potential. A conceptual model is then developed based on the key agricultural commercialization elements (Zhou *et al.*, 2013:2600). Leaning on the broad view of agricultural commercialization as expounded by various scholars and researchers (Brush & Turner, 1987; Pingali & Rosegrant, 1995; Von Braun & Kennedy, 1994), the authors define agricultural commercialization as an agricultural transformation process in which farmers shift from mainly consumption-oriented subsistence production towards market- and profit-oriented production systems.

Notwithstanding the widely-held view by various scholars and institutions (Awokuse & Xie, 2015; Bach & Pinstrup-Andersen, 2008; De Janvry, 2010; Obasanjo, 2013; SADC, 2011; World Bank, 2008) that agriculture plays an important role in poverty alleviation and economic development, in most Southern African countries smallholder agriculture farmers have remained subsistence-oriented without due recognition for their economic contribution. They face numerous challenges ranging from skills deficit; access to markets, technology, infrastructure, finance and unfavourable policies (Zhou *et al.*, 2013:2601).

The changing environment, however, presents opportunities which can catapult subsistence smallholder agriculture into commercial smallholder agriculture. Growth in demand as a result of population growth, urbanization, income growth, and changing consumer tastes, preferences and lifestyles are key factors that promise a positive outlook for smallholder agricultural commercialisation, including those of Southern Africa (Zhou *et al.*, 2013:2601).

According to Zhou *et al.* (2013:2601-2604), the key elements of agricultural commercialization are the following:

(i)   Factors promoting demand growth

The total population in SADC is expected to double by 2035, with urban population expected to outstrip rural population by 2030 and treble by 2035. This increases demand for both food and non-food agricultural products, which has a ripple effect in that increased demand for livestock products causes increased demand for crops used to produce stock feeds.

(ii)   Environmental changes pushing for renewed approaches

Increased demand resulting from increased population, urbanization and income, coupled with global warming and climate change, present challenges for traditional smallholder agriculture, and hence call for adapted approaches and market-oriented productivity revolution to meet these challenges.

(iii)   Factors making the operating environment more conducive to productivity

Agro-ecological conditions and natural resources (arable land, water and vegetation) are factors with which the Southern African region is endowed. These are suitable for the production of particular crops. These conditions are also conducive to trading livestock with non-producing areas. Countries such as Botswana, Namibia, southern Zimbabwe and northern South Africa are suitable for livestock production. Malawi, Mozambique, Zambia and the rest of South Africa are suitable for cropping. Opportunities in the form of market access are also presented by the ongoing relaxation and removal of trade barriers within SADC and the Common Market for East and Southern Africa (COMESA), and relations with other regional integration blocks such as the European Union (EU).

(iv)   Factors making operations more efficient

Access to appropriate technology and value chain integration can significantly improve efficiency, reduce transaction costs and promote commercialization. Growth in information and communication technology which is on the rise augurs well for efficiency.

(v)   Factors making individuals more committed to commercial activities

Entrepreneurial culture is one of the important key drivers of commercialization in the region. Whilst there is limited research on agricultural entrepreneurship in the region,

entrepreneurial capacity building can develop the commercial mind-sets required to trigger commercial activity in smallholder agriculture.

The following are the positive effects emanating from agricultural commercialization: increased productivity, family employment, increased household income through market participation and employment, improved consumption diversity, improved nutritional welfare, improved education, health and welfare, and improved household living standards. The negative effects of agricultural commercialization include failure to improve household nutrition and the livelihoods of the poorest; replacing subsistence risk with more complex market risk; failing to guarantee household food security; and opposing food self-sufficiency objectives (Zhou *et al.*, 2013:2604).

Figure 3.10 depicts the conceptual model which shows the interconnected elements or components of commercialization in the smallholder agricultural context.

These components are drivers, determinants (enablers and constraints), processes, approaches (strategies), indicators (measurement elements), and effects (which are positive and negative, and which are at household and societal level). The model can be used in the planning, implementation and review of commercialization programmes (Zhou *et al.*, 2013:2605).

Figure 3.10: A conceptual model of smallholder agricultural commercialization
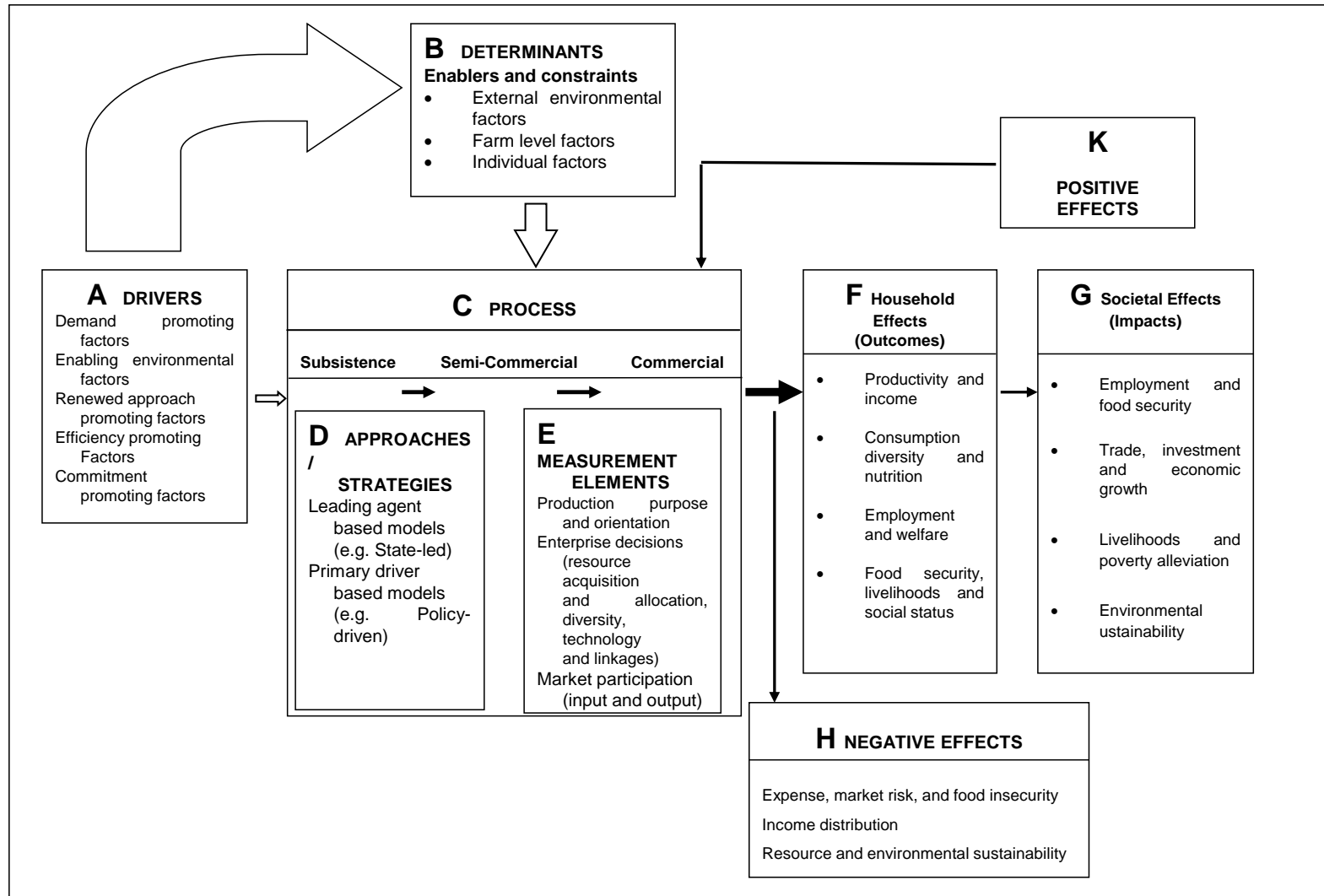
Source: Adapted from Zhou, Minde & Mtigwe (2013:2605).

As per the conceptual model, the various components play the following roles:

- Drivers – trigger the process by increasing demand through urbanization; creating an enabling environment through favourable policies and the provision of resources; being sensitive to climate change through the adopting of new and environmentally friendly farming methods; enhancing efficiency through adopting new technology; making farmers more committed by instilling an entrepreneurial spirit in them.

- Determinants – external environmental factors (socio-economic); farm level factors (farm resources); and individual factors (skills) facilitate smallholder agriculture commercialization or constrain it through their absence. The effects of these factors are also influenced by the drivers.

- Process – this implies that the progression of farmers from subsistence to commercial farming practices is conditioned by the approaches or strategies adopted (whether leading agent or primary driver). A combination of these approaches is said to be more effective.

- Measurement elements – this is to measure or indicate progress based on the purpose, orientation, nature of the enterprise decisions relating to resource allocation and technology, and the extent of market participation in terms of input and output.

- Positive effects – successful commercialisation is expected to yield positive outcomes such as growth in income at household level, and positive impact in the form of food security at societal level. Conversely, negative outcomes can emerge from commercialisation in the form of market risk, food insecurity, inequality in income distribution (high Gini coefficient), and resource and environmental unsustainability.

- What emerges is that the lessons learned from the exercise inform the formulation and implementation of future smallholder agriculture commercialisation programmes.

Zhou *et al.* (2013: 2606) point to the scarcity of comprehensive models of stimulating action, attitude change, entrepreneurialism and investment by smallholder farmers as one of the issues which future research should address. This observation corroborates the research problem for the current study.

In the context of the current study, the above conceptual model is insightful and instructive. Moreover, it can serve as a reference point in the development and implementation of the

model envisaged in this study. However, the above model by Zhou *et al.* (2013) has not been tested and validated

3.3.5 The lost and forgotten cornerstones: a rural development model (Jowah, 2013)

Lamenting the lack of development models for rural South Africa by both the apartheid-era and current governments, Jowah's (2013) study focuses on the marginalized rural population comprising roughly 51 per cent of the national population. The author cautions that academic papers and government wish lists do not reduce poverty, but that practical and visionary leadership using "projectification" is the pre-requisite to changing the poverty demographics of South Africa (Jowah, 2013:240). According to the author, a joint effort by government, land, land bank and non-governmental organizations (NGOs) using "projectification" of rural development can turn the rural economy around. Jowah (2013:240), in this context, considers rural development as economic activities and initiatives undertaken to provide opportunities of participation of the rural people in the national economy.

Jowah (2013:241) acknowledges the sub-standard levels of agricultural-literacy amongst the black population in the country, where available land is used as a home to retire to as opposed to a commercially-oriented asset which can be used productively. The author asserts that the education system based on the Australian model of education and introduced by the ANC government is irrelevant to the needs of the black people who were denied skills training by previous governments. The author further critiques that although the post-apartheid government was aware of the massive land redistribution programme, which would involve semi-illiterate blacks (in terms of agriculture), no provision was made for introducing massive agricultural programmes at high school level and the opening of agricultural colleges throughout the provinces.

Figure 3.11: Proposed rural development model.

Better hospitals
Better schools

Political will
Political leadership
resources

Clean water supply
Electricity supply

Projectification
Visionary leadership

EXTERNAL

Non-Governmental
Organizations

INTERNAL – TO BE

Knowledge of
1. Type of poverty
2. Cause of this poverty
3. Ideal products
4. Skills of the poor

Training of skills
1. Entrepreneurial skills
2. Agronomy crop production
3. Leadership skills
4. Motivation of self-sufficiency

Rural Development Model

1. Conscientisation of the poor
2. Empowerment of the poor

1. Production of primary goods
2. Production of secondary

1. A developed rural economy
2. Growth of rural service centres
3. Wealth retention

Source: Adapted from Jowah (2013:246).

Jowah(2013:242) emphasizes that the economic needs of the rural population can be addressed using resources, such as land and human resources (as labour/people), at their disposal. The author develops a model (Figure 3.11) which pre-supposes the possession of the land by the rural population in South Africa. The latter should be understood in the context of the history of South Africa.

The model uses the production of peanut butter as proxy, and Bizana Tribal Trust Land in the Eastern Cape was identified as the experimental ground.

Jowah outlines (2013:243) reasons for Bizana Tribal Trust Land as the preferred choice of the experimental ground. Amongst others, the factors include that it is in a high rainfall area with the ideal soil conditions and a lot of land and fields are lying waste. Furthermore, a small rural service centre can be found along the national road, serving as the major link between KwaZulu Natal and Eastern Cape.

At programme design level, the model envisages assistance in terms of tractors for ploughing, seeds for planting, and weedicide for weed control. The peasant will then supply the labour and be trained in the basic skills required for farming peanuts (Jowah, 2013:244). According to the author, the next phase of this model is the secondary industry, and the owner of the secondary industry should be able to manufacture or process the primary goods to the expected government standards. The same owner should be able to pay cash to the farmers to encourage them to work to get money (Jowah, 2013:244).

Jowah (2013:247) identifies government, the donors (if money comes from donors), NGOs, the training structures, and the beneficiaries themselves as the major stakeholders in the proposed model, each having a role to play. For instance, political will and visionary political leadership should originate from government. Government is constitutionally obliged to provide resources to develop the rural economy. In addition, it should offer strong political, legal, financial support in the form of infrastructure development, whilst a hands-off approach by politicians is desired (Jowah, 2013:247).

The author suggests that external donors (not from the country) use the existing legal route to reach out to their target market without having a direct impact on grassroots operations. Local donors may access the beneficiaries through the responsible NGOs and may also assist in the establishment and provision of training of the rural community in agriculture and other development aspects (Jowah, 2013:247).

Jowah (2013:247) cautions that whilst beneficiaries are purely dependent on the assistance that comes their way, their willingness or unwillingness is critical to the outcome of the undertakings. It is also of paramount importance that politicians make an effort to have a thorough understanding of the type of poverty, its causes, the limitations and potential of the community involved, and the type of agricultural products ideal for that

particular community (Jowah, 2013:247). The author suggests that the interaction of the various factors as postulated in the model may have far-reaching consequences resulting in a developed rural economy; growth of rural service centres; wealth retention; higher standards of living; and semi-urban structure.

The main feature of the proposed model is rural development in general and entrepreneurship is not specifically linked to the development of the agricultural sector of South Africa.

3.3.6 Innovation approaches (model) for sustainable productivity among tribal families (Suman, Murthy & Chandrasekhar, 2014)

Suman *et al.* (2014) assert that the effectiveness and efficiency of the agricultural extension system in India can be improved upon by motivating and mobilizing the rural population towards sustainable productivity. The authors highlight the need for efficient and innovative approaches in order to organize and strengthen the farming community to achieve better participation, adoption and empowerment (Suman *et al.*, 2014:5).

Wary of the inadequacy of the present departmental mode of organization and management public systems in agricultural research and extension, Suman *et al.* (2014:5) suggest a shift from a hierarchical and linear technology generation-diffusion model to a non-linear and holistic learning mode. Basing their study on innovative approaches for sustainable productivity for the tribal families of East Godovari District of India, Suman *et al.* (2014:6) suggest suitable and innovative extension strategies to bring a desirable change in improving the livelihood of rural and tribal societies, striving towards productivity and sustainability. These include:

(i) Improving extension research linkages: the authors advocate for the promotion of direct interface between farmers and scientists to minimize transmission losses.

(ii) Capacity building of extension functionaries: the authors suggest the formulation of Human Resource Development (HRD) policy by states to avail the central support of HRD and the formulation of a long-term training plan for extension functionaries which will encompass foundation phase- and professional courses. Foundation phase courses may cover areas such as needs assessment techniques, group

formation, development of entrepreneurial skills, agri-business, agri-business management, World Trade Organization (WTO) and its implication, marketing of agricultural production, post-harvest management, management of common property resources, use of different type of media, and communication.

(iii) Empowerment of farmers: in order to recognize farmers as stakeholders in the extension system, there is a need to involve them in setting extension system agenda for implementation of extension programmes through farmers' user groups. Acquisition of skills by farmers through training is also regarded as an integral part of farmers' empowerment.

(iv) Mainstreaming of women in agriculture: special programmes for improving access to extension, training and knowledge to enhance abilities of rural and tribal women, are pivotal for livelihood security. Women as model (focus targeted at woman in the family); market-led model (entrepreneurial abilities); bottom-up model (allocation of resources at grass roots level); and cyclic model (involving women clientele, extension workers and researchers by two-way communication) are some of the innovative extension approaches.

(v) Use of information technology: the increased use of information technology in agricultural extension is considered important when developing the knowledge and skills of the farming community. Marketing of agricultural produce can also benefit greatly from the use of information technology.

(vi) Financial sustainability and resource mobilization: recognizing the fact that public funded extension will continue to play a predominant role in technology dissemination, cost-effective measures such as the efficient use of available resources; privatization of agro-services; realistic cost of recovery of agro-services; co-financing of public extension by farmers; and the initiating of a new financial system, are suggested.

(vii) Integration of extension elements: all stakeholders in the extension system such as government agencies, NGOs, farmers' organizations, farmers clubs, and private sector agencies should be involved in the planning of programmes thus ensuring an integrated extension system.

(viii) Agri-preneurship development: farmers should be trained in: developing entrepreneurship, capacity to take initiatives in new ventures, business acumen,

marketing skills and develop competence to infuse primary processing activities (grading and labelling) so that its produce earns maximum price and profitability.

(ix)   Introduction of para-professional/vocational courses: in agriculture and allied areas, self-employed graduates should be supported at grass root level in agri-business and agri-clinics, as part of a strategy for employment-oriented agricultural education.

(x)   Leadership development: leadership and team working, managerial qualities, computer literacy for the updating of technical management and commercial knowledge, national policies, and global happenings offering the latest and the most viable information on, and solutions for problems faced by farming community, should be framed at village level and district level.

Figure 3.12: Innovative approach/model for sustainable productivity in rural and tribal areas
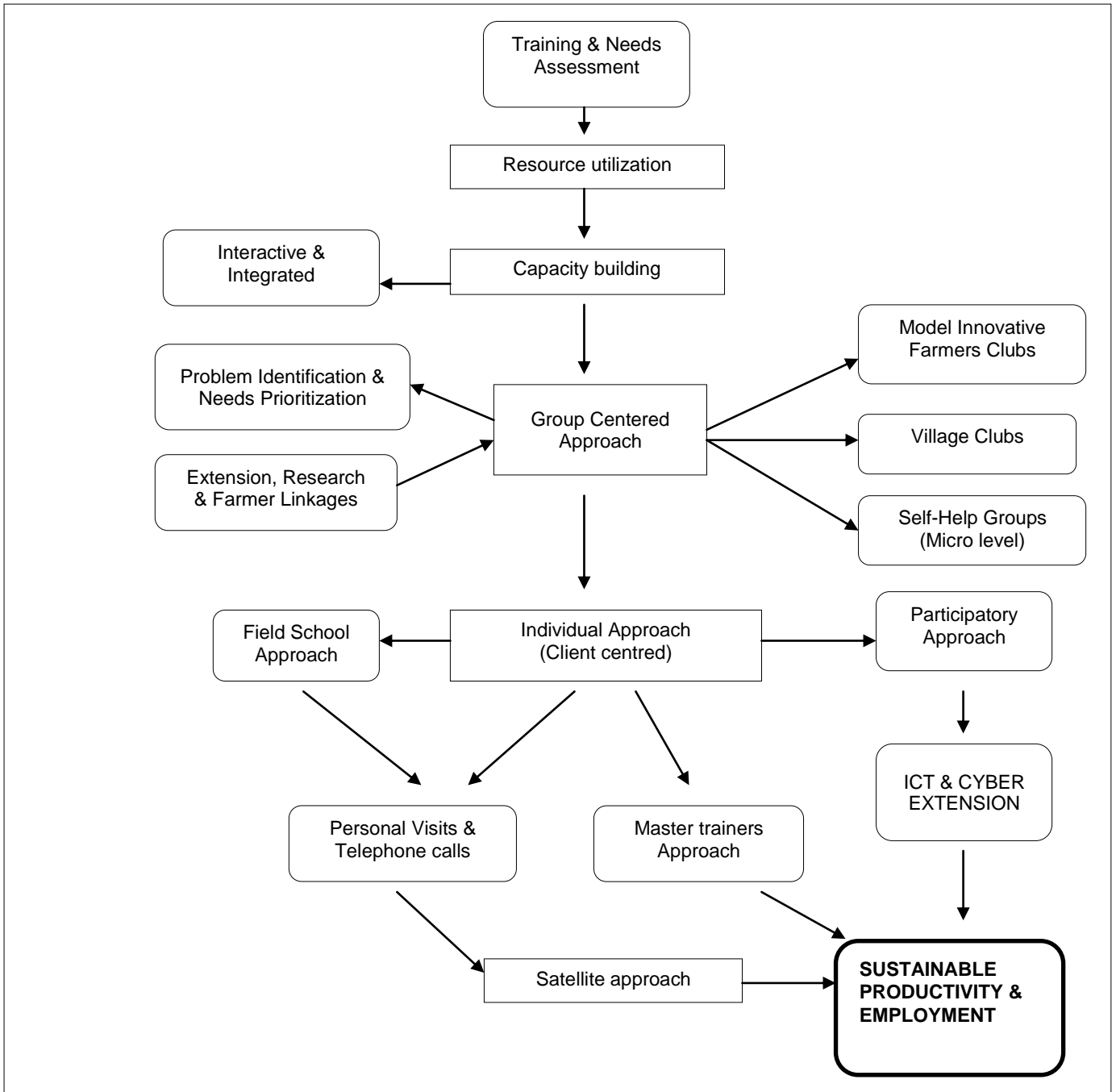
Source: Adapted from Suman *et al*. (2014:9).

Figure 3.12 depicts a step-by-step innovative approach or model for sustainable productivity in rural and tribal areas as proposed by Suman *et al*. (2014).

The main objective of the proposed model is to ascertain suitable extension approaches to achieve sustainable productivity of tribal and rural household. The focus, therefore, is on the improvement of the effectiveness and efficiency of the agricultural extension system and not the application of entrepreneurship to agricultural development *per se.*

3.3.7 An entrepreneurial framework to enhance the agricultural sector (Modiba, 2009)

Lamenting the low productivity of the agricultural sector of the Limpopo province in spite of the support that government renders, and the low entrepreneurial activity rates of South Africa in general, Modiba (2009:4-5) attempted to investigate levels of entrepreneurial activities in the agricultural sector and devised a framework that would enable the Limpopo provincial agricultural sector to measure the extent of entrepreneurship within the province; ultimately devising strategies for enhancing it.

Modiba (2009:25) highlights the following challenges facing entrepreneurs:

- Lack of education and skills: approximately 90 per cent of business failure relates strongly to a lack of managerial skills such as financial skills, planning, managing of credit and recordkeeping.

- Finance: access to finance is the greatest stumbling block for South African Small, Micro and Medium Enterprises (SMMEs) and it needs addressing if an environment promoting entrepreneurship and SMMEs development is to be encouraged.

- Government policies and programmes: though government has invested considerable resources into supporting small enterprises, most businesses hardly access these programmes. This can be attributed to ignorance.

- Physical infrastructure: infrastructure plays a critical role in both growth and poverty reduction.

- Business information services: availability of accurate and meaningful information still constitutes a problem for the entrepreneurial sector in South Africa.

- Access to markets: distant markets confine farmers to selling their farm products mainly to hawkers and within the district. Accessibility to proper marketing facilities could help towards improved production planning, expansion and better prices, lower risk and efficient utilization of resources.

In light of the above constraints to entrepreneurial activity in the Limpopo province, Modiba (2009:66-67) recommends an entrepreneurial framework for promoting entrepreneurship

in this province. This implies enhancing the environment for entrepreneurship by creating the right culture and conditions for entrepreneurship; creating the right agricultural entrepreneurial policy; investing in a high quality, integrated system of support services – integrated and coordinated business support for all; fostering entrepreneurial education at all levels to ensure capacity building for diverse enterprises; strengthening business-to-business networking opportunities; and monitoring and evaluating entrepreneurship support interventions.

Figure 3.13 diagrammatically depicts the proposed entrepreneurial framework.

The main feature of the study is the formulation of an entrepreneurial framework to enhance the agricultural sector in a district of the Limpopo Province. This is merely a theoretical framework and does not translate into a model which is empirically validated.

Figure 3.13: An entrepreneurial framework to enhance the agricultural sector
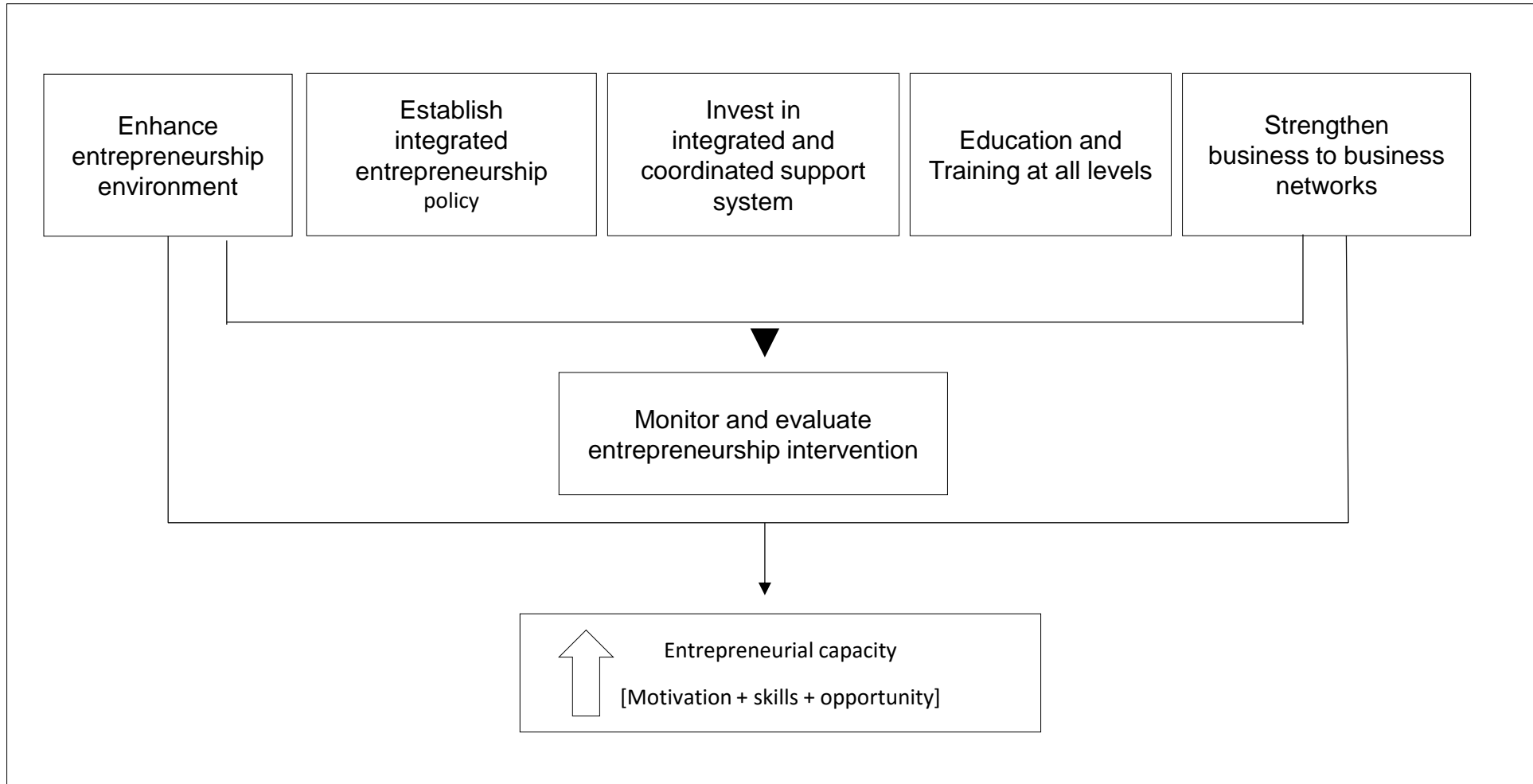
Source: Adapted from Modiba (2009:68).

The next sections (3.4 and 3.5) critically review the presented conceptual frameworks and models on entrepreneurship and agricultural development in terms of their relationship with and potential contribution to the envisaged conceptual model on agricultural-entrepreneurial development.

3.4 CRITICAL REVIEW OF ENTREPRENEURIAL CONCEPTS, FRAMEWORKS AND MODELS

As stated in chapter two, this study regards an enabling environment as consisting of factors in the external environment with a bearing on entrepreneurial performance such as: supportive and cooperative structures; entrepreneurial orientation; entrepreneurial competencies; and agricultural sustainability.

As regards supportive and cooperative structures, which may be constituted by regulatory framework, financial support, non-financial support, role models, culture, social capital, market conditions, and education and training, extant literature (Gnyawali & Fogel, 1994; Nieuwenhuizen & Nieman, 2014; O'Connor, 2013; Prescott, 1986; Zahra, 1993) presents perspectives that emphasise the importance of the external environment to entrepreneurial performance.

The frameworks and conceptual models presented by the above researchers have elements of the external environment that relate to the construct of supportive and cooperative environment. Prescott's (1986) model regards the external environment measured by market structures to be critical to entrepreneurial performance because it establishes the context in which to evaluate the relationship between strategy and performance. Gnyawali and Fogel's (1994) integrated framework contains factors that are crucial to fostering a supportive external environment for entrepreneurial performance. What is required for business creation, growth and economic development are: an environment that provides a clear and simple regulatory framework in terms of laws and rules that govern business operations; a societal culture that welcomes and encourages entrepreneurial activities; a financial system that is supportive of entrepreneurship and small business development; and good transport and communication infrastructure.. Nieuwenhuizen and Nieman (2014) also emphasise the importance of the above factors,

including some which are regarded dimensions of entrepreneurial orientation, such as risk-taking, innovation, proactiveness and competitive aggressiveness (Miller, 1983; Lumpkin & Dess, 1996). O'Connor (2013) also highlights the need for government policy that focuses entrepreneurship education on economic and market-related outcomes. These models and frameworks in the supportive and cooperative environment for enhancing entrepreneurial performance are reinforced by literature (Carlsson et al, 2013; Kiggundu, 2002; Minniti, 2008) as reported in chapter two. They have a bearing on the envisaged conceptual model in the present study because of their importance for creating an enabling environment for entrepreneurship development.

The various models and frameworks (Covin & Slevin, 1991; Lado & Vozikis, 1996; Nieuwenhuizen & Nieman, 2014; Zahra, 1993) presented above exhibit elements of the external environment with relevance to entrepreneurial orientation. Entrepreneurial orientation is measured by the dimensions of risk-taking, innovation, pro-activeness, competitive aggressiveness, as confirmed by the literature presented previously. Zahra's (1993) model, in its investigation of the importance of the external environment to corporate entrepreneurship, highlights innovation, a dimension of EO, as an important factor. Innovation is considered crucial regarding new product introduction, new business creation, and therefore entrepreneurial performance. In their models, Nieuwenhuizen and Nieman (2014), and Covin and Slevin (1991) recognise EO, encompassing risk-taking, innovation, pro-activeness, and competitive aggressiveness, to be another important factor in entrepreneurship development. Lado and Vozikis' (1996) framework on technology transfer lends support to EO as one of the external environmental factors that are purported to contribute to entrepreneurial performance (Rauch *et al.*, 2009; Nieuwenhuizen & Nieman, 2014). These models and frameworks together with extant literature on EO seem to provide useful input into the development of the conceptual model contemplated in this study.

The models by Antonites (2003), Haynie *et al.* (1994), and Obschonka *et al.* (2011) highlight the external environment as a necessary condition for entrepreneurial performance in the context of entrepreneurial skills development. Antonites' (2003) training model, as constituted by entrepreneurial skills (risk propensity, creativity and innovation, opportunity identification, role models), business skills (general management skills, marketing skills legal skills, operational skills, human resource management skills,

communication skills, business plan skills, financial management skills), and performance motivation, represents relevant reference material for the development of the conceptual model as envisaged in the present study. Some of these factors such as risk propensity, role models and innovation also form part of EO in the literature. Naffziger *et al.*'s (1994) model of entrepreneurial motivation hinges on personal environment, business environment and goal setting of the entrepreneur. This is in line with Antonites' perspective regarding motivation as a driving force for entrepreneurial performance. The models by Haynie *et al.* (2010) and Obschonka *et al.* (2011) emphasise training and entrepreneurial skills development in order to develop thinking capacity for resolving complex problems and strive for entrepreneurial success. Similarly, the importance of motivation and entrepreneurial skills development to enhance entrepreneurial performance is confirmed in the literature (Antonites, 2003; Lans *et al.*, 2014).

The above critical review shows how the various models and frameworks on entrepreneurial peformance are consonant with literature on the creation of a conducive external environment for entrepreneurship development and entrepreneurial performance, and provide insights that could be used in the development of the conceptual model of agricultural-entrepreneurial development envisaged in this study.

Table 3.3 presents the entrepreneurial concepts, frameworks and models identified and their relationship with the elements of the conceptual model.

Table 3.3: Entrepreneurial concepts, frameworks and models related to entrepreneurial performance

Elements of the conceptual model	Key relationships of the framework/model with the elements of the conceptual model	Author(s) and year
Supportive environment:		
- Regulatory framework	- Environment is critical for establishing relationships	Prescott 1986
- Financial support	- As with firm performance, similar relationships may exist between environmental factors and performance of an individual entrepreneur	Gnyawali & Fogel 1994
- Non-financial support		
- Role models	- External environment, technology, role models, education, supportive government regulations, and innovation are critical for	Nieuwenhuizen& Nieman 2014
- Culture		

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Elements of the conceptual model	Key relationships of the framework/model with the elements of the conceptual model	Author(s) and year
- Social capital (networking) - Market conditions - Education and training	entrepreneurship development and entrepreneurial performance - Government policy to promote entrepreneurship through entrepreneurship education, resulting in entrepreneurial performance, and hence, stimulating increased levels of economic activity.	O'Connor 2013
Entrepreneurial orientation: - Technology and innovation - Risk taking - Pro-activeness	- Critical importance of technology transfer considerations - Recipient country's level of economic development and recipient firm's capacity to absorb and effectively utilize imported technology - Little systematic empirical evidence exists to validate the perceived strong positive relationship between entrepreneurial posture and firm performance - External environment is important in corporate entrepreneurship	Lado & Vozikis 1996 Nieuwenhuizen & Nieman 2014 Covin & Slevin 1991 Zahra 1993
Entrepreneurial competencies: - Entrepreneurial skills - Business skills - Technical skills - Performance motivation - Mentorship	- Entrepreneurial performance (E/P) is a function of performance motivation (M), entrepreneurial skills (E/S), and business skills (B/S) - Goal-setting by the entrepreneur regarded as a key motivator for the entrepreneur continuing with the business beyond start-up, provided success prospects are prevalent - Offers insight into opportunity recognition, entrepreneurial action, new venture creation, and firm growth	Antonites 2003 Naffziger, Hornsby & Kuratko 1994 Haynie, Shepherd, Mosakowski & Early 2010

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Elements of the conceptual model	Key relationships of the framework/model with the elements of the conceptual model	Author(s) and year
	- Entrepreneurial skills, developmental periods and dispositional personality traits, role models, early entrepreneurial competence, entrepreneurial success, all have a bearing on entrepreneurial performance and consequently, developmental outcomes.	Obschonka, Silbereisen & Schmitt-Rodermund 2011

Sources: Antonites (2003); Colvin & Slevin (1991); Gnyawali & Fogel (1994); Haynie *et al.*, (2010); Lado & Vozikis (1996); Naffziger *et al.* (1994); Nieuwenhuizen& Nieman (2014); Obschonka *et al.* (2011); O'Connor (2013); Prescott (1986); Zahra (1993).

3.5 CRITICAL REVIEW OF AGRICULTURAL CONCEPTS, FRAMEWORKS AND MODELS

Agricultural sustainability is among the factors regarded as constituting the external environment and having a bearing on entrepreneurial performance, and may be manifested by climate change, extension services, ecosystem, biodiversity and soil erosion. According to extant literature (Banson *et al.*, 2015; Mmbengwa *et al.*, 2013; Nkambule & Dlamini, 2012; Pretty, 2008; Suman *et al.*, 2014) agricultural sustainability could be enhanced by adopting a holistic and integrated approach that takes into account all the factors impacting agricultural productivity.

The models and frameworks on agriculture presented in this chapter have elements on the construct of agricultural sustainability. For instance, the model by Lahiff (2007) highlights the importance of a thorough audit on community needs, including the community's capacity to implement agricultural projects which are meant to improve the livelihoods of the members of the community. It also stresses training in leadership and technical skills. This is usually part of extension services which could be an element in the envisaged conceptual model. Literature (Chang, 2009; Suman *et al.*, 2014) confirms that extension services are crucial to agricultural sustainability. One case in point is the model by Suman *et al.* (2014), which advocates innovation approaches for sustainable productivity; an

effective and efficient agricultural extension services system; the use of information technology in agricultural extension; the involvement of stakeholders in the design and implementation of extension system; the development of entrepreneurial and business skills; and other relevant skills and infrastructure that can contribute to agricultural sustainability. Studies (Ministry of Lands and Resettlement, 2010; Werner & Odendaal, 2010) conducted on land reform in Namibia attest to the lack of a support system for farmers under the resettlement programme of the government. Therefore, the abovementioned elements could be useful for the envisaged conceptual model.

The model by Zhou *et al*. (2013) emphasises developing models on agricultural entrepreneurship that would assist in transforming subsistence agriculture into commercial agriculture, particularly by smallholder farmers. This appears relevant to the objective of the envisaged conceptual, namely, the development of agricultural entrepreneurship to potentially enhance entrepreneurial performance in the agriculture sector. Models that stimulate action, attitude change and entrepreneurialism are not in existence, as Zhou *et al*. (2013) point out. Their model, in line with the models on entrepreneurial performance expounded above, recognises the importance of external environmental factors (socio-economic) as enablers of a conducive environment for entrepreneurial performance. Key elements of commercialisation that their model addresses, such as climate change, technology (new techniques in agricultural production; innovations in seeds, pesticides, fertilizers) and entrepreneurial culture, are acknowledged by extant literature (Chang, 2009; Nkambule & Dlamini, 2012; Pretty, 2008) as critical for agricultural productivity and sustainability. The conceptual model of agricultural entrepreneurial development envisaged in this study, which aims to address agricultural productivity and sustainability, will therefore also encompass elements of the commercialisation of agricultural practices.

Hirroka's (2010) model promotes the adoption of a system approach to organisation of information and identification of gaps. This is corroborated by literature (Banson *et al*., 2015) advancing a systems thinking approach to addressing complex agricultural problems by regarding them as parts of the overall system and thus avoiding a piecemeal approach. In the same vein, Castella *et al*.'s (2007) model of integrated land-use aims at ensuring improvement in land-use management in order to mitigate soil erosion and land degradation, thus lending weight to agricultural sustainability, which is a potential construct of the conceptual model envisaged in the present study. Literature (Nkambule & Dlamini,

2012; Pretty, 2008) again confirms this narrative. Jowah's (2013) model focuses on rural development in general and does not address entrepreneurship in an agricultural context, *per se.* Modiba's (2009) theoretical framework on entrepreneurship in the agriculture sector advocates the provision of the following critical factors: training in technical- business- and entrepreneurial skills; promoting the right culture for entrepreneurship development; formulation of appropriate agricultural entrepreneurial policies; and implementation of a monitoring and evaluation mechanism to assess the impact of various interventions in the agricultural sector..

It is apparent from the above analysis that the models and frameworks of agriculture reviewed contain elements suitable to the promotion of agricultural sustainability, and could provide a useful basis for the development of the conceptual model of agricultural entrepreneurship contemplated in the present study.

Table 3.4 presents the agricultural-development concepts, frameworks and models identified and their relationship with the elements of the conceptual model.

Table 3.4: Agricultural concepts, frameworks and models related to entrepreneurial performance

Elements of the conceptual model	Key relationships of the framework/model with the elements of the conceptual model	Author(s) and year
Agricultural sustainability:		
- Extension services	- Realistic assessment of community needs	Lahiff 2007
	- Capacity building within communities	
	- Development of a variety of land-use options	Suman, Murthy & Chandrasekhar 2014
	- Focus is on the improvement of the effectiveness and efficiency of the agricultural extension system and not the application of *entrepreneurship per se* to agricultural development.	Modiba 2009
	- This is merely a theoretical entrepreneurship framework and does not translate into a model	Jowah 2013

Elements of the conceptual model	Key relationships of the framework/model with the elements of the conceptual model	Author(s) and year
	which is validated - The proposed model focuses on rural development in South Africa in general without specifically linking entrepreneurship to the development of the agriculture sector	
- Ecosystem, biodiversity, soil erosion	- Modelling can complement traditional research methods - Modelling projects can stimulate multidisciplinary research - Modelling has a value as both a teaching and research tool	Hirooka 2010 Castella, Kam, Quang, Verburg & Hoanh 2007
- Climate change	- Scarcity of comprehensive models of stimulating action, attitude change, entrepreneurialism and investment by smallholder farmers give rise to the need for future research	Zhou, Minde & Mtigwe 2013

Source: Castella *et al.* (2007); Hirooka (2010); Jowah (2013); Lahiff (2007); Modiba (2009; Suman *et al.* (2014); Zhou *et al.* (2013).

3.6 ENTREPRENEURIAL PERFORMANCE AND AGRICULTURAL SUSTAINABILITY

It has been stated that entrepreneurship is important for economic development, particularly in terms of economic growth, job creation, increased productivity and technological innovation (Hall *et al.*, 2010; Wiklund *et al.,* 2011). It has also been stated that agriculture contributes to economic growth and development (Bach & Pinstrup-Andersen, 2008; SADC, 2012; World Bank, 2008). Entrepreneurship is regarded as a catalyst for agricultural growth in terms of innovation in production methods and product development (Ghiasy & Hosseini, 2012; Kelly *et al.*, 2010).

Various authors (Dale *et al.,* 2013; Nkambule & Dlamini, 2012; Suman *et al.,* 2014) highlighted the importance of conserving natural resources and the ecosystem; preserving biodiversity; and preventing soil erosion and degradation in order to enhance sustainable agriculture. Entrepreneurial performance has been found to result in profitability, increased incomes and increased market share (Antonites, 2003; Lucky 2011).

It can be postulated, therefore, that agricultural sustainability is a prerequisite for entrepreneurial performance. In the context of this study, just as other factors, such as a supportive environment; entrepreneurial orientation; and entrepreneurial competencies, are prerequisites for entrepreneurship development and entrepreneurial performance, so agricultural sustainability is even more of a criterion considering that climate change threatens global food production and security. Therefore, ensuring an enabling environment as defined by these factors is vital for increased entrepreneurial activities and entrepreneurial performance in the agriculture sector.

In the context of the present study, it has been stated that current government policies on agriculture and land reform do not induce an enabling environment that would assist farmers to farm productively and profitably. Additionally, the uncritical adoption and application of the Large-Scale Commercial Farming (LSCF) model has resulted in projects that are irrelevant to the circumstances of the rural poor owing to unworkable project design; thus leaving little room for entrepreneurial activities (Aliber & Cousins, 2013:140; Ministry of Lands and Resettlement, 2010:54; Werner & Odendaal, 2010:22). In light of the above, therefore, entrepreneurial performance may be regarded as an appropriate measure of progress in the agriculture sector.

3.7   STAKEHOLDERS AND ENTREPRENEURIAL PERFORMANCE

As is evident from various authors (Gnyawali & Fogel, 1994; Kiggundu, 2002; Minnitti, 2008; Modiba, 2009; Nieuwenhuizen & Nieman, 2014; Suman *et al.*, 2014) creating an enabling environment to foster entrepreneurship and entrepreneurial performance cannot be the responsibility of government alone. There is need for stakeholders to participate in creating such enabling environment.

According to Freeman (in Pinho & De Sá (2013:2), a stakeholder may be defined as an individual or group of individuals who can affect or is affected by the achievements of the organization's objectives. In this study, stakeholders are defined as all role players in the agriculture sector, such as government, educational institutions, civil society, farmers, farmers' clubs, farmers' organizations, non-governmental organizations, private sector agencies, agricultural experts, family and friends, and financial institutions.

Pinho and De Sá (2013:3) highlight the important role that public and sectorial institutions, research centres, universities, financial institutions, close relatives, friends and colleagues, play in entrepreneurship and entrepreneurial performance. The authors posit that national and regional governments, having realised the importance of entrepreneurship to economic development, offer a variety of programmes to foster entrepreneurship and entrepreneurial performance. Research centres, schools and universities play a role in ensuring that entrepreneurship education forms part of their research programmes and academic and school curricula, as a way of developing highly qualified human resources that can create new businesses. There is wide recognition of the role that financial institutions, be it commercial banks, venture capitalists or business angels, play in providing finance in the form of loans or other financing mechanisms to support entrepreneurship and entrepreneurial performance. In the same vein, relatives, friends and colleagues provide financial and technical assistance to foster entrepreneurial performance (Pinho & De Sá, 2013:4-7).

In the context of this study, government, educational institutions, civil society, farmers, farmers' clubs, farmers' organizations, non-governmental organizations, private sector agencies, agricultural experts, family and friends, and financial institutions, can play similar roles in fostering entrepreneurship and entrepreneurial performance.

The following section describes the general framework of agricultural-entrepreneurial development and the conceptual model of agricultural-entrepreneurial development.

3.8 CONCEPTUAL MODEL OF AGRICULTURAL-ENTREPRENEURIAL DEVELOPMENT

The extant literature contains no appropriate and suitable model that addresses the construct of agricultural-entrepreneurial development. This is re-enforced by Modiba (2009); Suman *et al.* (2014) and Zhou *et al.* (2013), who state that the scarcity of models on agricultural-entrepreneurial development presents opportunities for further research in this area to stimulate action, attitude change, entrepreneurialism and investment by smallholder farmers.

From an entrepreneurship perspective, the models by Antonites (2003); Colvin and Slevin (1991); Gnyawali and Fogel (1994); Lado and Vozikis (1996); Naffziger *et al.* (1994); and Nieuwenhuizen and Nieman (2014) have variables with elements on entrepreneurship. The model by Colvin and Slevin (1991) in its external environment contains an element of technological sophistication which is a critical element in innovation and entrepreneurial development. The model by Gnyawali and Fogel (1994) comes very close to addressing the environmental conditions which are prerequisites for developing and enhancing entrepreneurship in any setting. It considers government policies and procedures; socio-economic conditions; entrepreneurial and business skills; financial and non-financial support to business, as essential elements for entrepreneurship to take root. The model by Antonites (2003) contains elements critical to the enhancement of entrepreneurial performance, but excludes other important elements such as technical skills, mentoring and incubation. The model by Nieuwenhuizen and Nieman (2014) encapsulates similar fundamental elements to entrepreneurship development such as entrepreneurial orientation; supportive environment; and cooperative environment, which are highlighted in chapter two.

From the agricultural perspective, none of the models presented in the literature review have any clear and strong leaning towards entrepreneurship as a driver of agricultural development. The model by Lahiff (2007) contains a critical element in as far as it emphasizes the importance of current livelihoods activities. The latter are inputs to serve as the formulation of interventions in the agricultural sector subsequent to a realistic assessment of community needs including socio-economic status and skills. The model by

Zhou *et al.* (2013) points to enabling environmental factors as drivers of smallholder agricultural commercialization.

In order to inform the conceptualization of the AEDM, a conceptual framework is presented which provides a broader understanding of the factors at play with regard to entrepreneurial performance. Figure 3.14 below presents the conceptual framework.

Figure 3.14: A conceptual framework of agricultural-entrepreneurial development
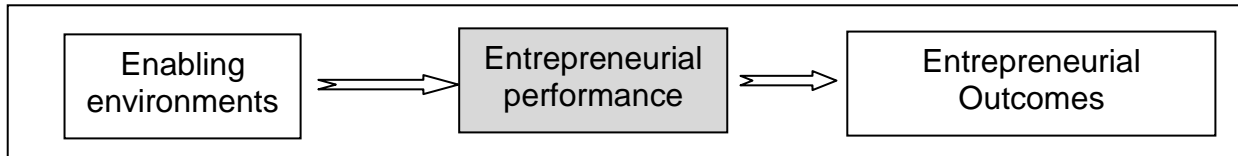
The proposed framework proceeds from the premise that an enabling environment encapsulating environmental variables contained in some of the models reviewed, should create the necessary condition for farmers' skills development. These, in turn should result in increased entrepreneurial activity and performance, and therefore increased agricultural productivity, increased incomes, and improved livelihoods of targeted farmers. Supportive environments, entrepreneurial orientation, entrepreneurial competencies and agricultural sustainability all represent enabling environments. Entrepreneurial performance is represented and evidenced by growth in agricultural business, increased competitiveness, and growth in agricultural start-ups. Entrepreneurial outcomes are agricultural productivity, increased incomes, and improved livelihoods. The framework presupposes a monitoring and evaluation component to ensure that the interventions have the desired impact. This will be demonstrated in the conceptual AEDM. Entrepreneurial performance is the unit of analysis in this model.

The above conceptual framework forms the basis for the development of the conceptual AEDM, which this study set out to accomplish. Consequently, the study is building and testing theory through the development and validation of the AEDM. It is exploratory. Whetten (1989:490) opines that for a theory to be regarded as complete, it must address the following elements: factors (variables, constructs, concepts) that explain the phenomenon of interest; how the factors are related, and whether there are causal effects; and justification for the selection of the factors and the presumed causal relationship between the factors. According to Colquitt and Zapata-Phelan (2007:2007), theory building

means the degree to which an empirical study clarifies or supplements existing theory or results in new theory through the introduction of relationships and constructs.

Figure 3.15 presents the conceptual model on agricultural-entrepreneurial development.

Figure 3.15: A conceptual model on agricultural-entrepreneurial development

Enabling Environments

Supportive Environment
-regulatory framework
-financial support
-non-financial support
-culture
-social capital (networking)
-market conditions
-role models
-education and training

Entrepreneurial Orientation
-technology and innovation
-risk taking
- pro-activeness

Entrepreneurial Competencies
-entrepreneurial skills
-business skills
-technical skills
-performance motivation
-mentorship

Agricultural Sustainability
-extension services
-climate change
-ecosystem, biodiversity, soil erosion

Entrepreneurial Performance
-growth in agricultural business
-increased competitiveness
-growth in agricultural start-ups

Monitoring and Evaluating Entrepreneurial Performance

Entrepreneurial Outcomes
-agricultural productivity
-increased incomes
-improved livelihoods

Note:
 solid arrows ⟶ signify a positive impact of the enabling constructs on entrepreneurial performance

thick solid arrow ⟹ signifies the monitoring and evaluation of entrepreneurial performance

This study considers establishing direct causal relationships between the constructs.

The following propositions are stated for the conceptual AEDM:

P1: Supportive environment has a positive direct influence on EP.

P2: Entrepreneurial orientation has a positive direct influence on EP.

P3: Entrepreneurial competencies have a positive direct influence on EP.

P4: Agricultural sustainability has a positive direct influence on EP.

P5: EP has a positive direct influence on agricultural productivity.

P6: EP has a positive direct influence on increased incomes.

P7: EP has a positive direct influence on improved livelihoods.

Monitoring and evaluation, and stakeholders have been included in the measurement instrument (questionnaire) for exploratory research purposes, and will not be part of inferential statistical testing.

The various components of the conceptual model are elaborated on in the following paragraphs.

3.8.1 Supportive environments (SE)

A supportive environment is a critical element of an environment conducive to the promotion of entrepreneurship. Various scholars (Aldrich & Kim, 2007; Carlsson *et al.*, 2013; Gnyawali & Fogel, 1994; Hindle & Meyer, 2008:3; Kiggundu, 2002; Klyver *et al*, 2008; Lim *et al.*, 2010) attest to such importance. Gnyawali and Fogel (1994:44) refer to the overall economic, socio-cultural, and political factors that influence people's willingness and ability to undertake entrepreneurial activities. The authors refer to the availability of assistance and support services that facilitate the start-up process.

Carlsson *et al.* (2013:914) state that the socio-economic environment, consisting of availability of finance, economic and social policies, the presence of industry clusters, and geographic parameters, may influence entrepreneurial activities.

Lim *et al.* (2010:509) posit that government can foster an entrepreneurially munificent institutional environment for venture creation by adopting a legal system with stronger property rights protection and less regulatory complexity. It can also provide easier access to debt financing through the banking system, considering that many aspects of a business system are determined by government policy.

Kiggundu (2002:239, 245) points to various macro-economic and socio-cultural variables in the external environment including deregulation, legal framework, property rights, social capital, services to public, and infrastructure as necessary, yet insufficient for sustaining changes in entrepreneurial competencies and firm performance.

It is stated that a culture of suspicion and hostility towards entrepreneurs is detrimental to the development of entrepreneurship in any setting. Earlier, it was mentioned, by way of example, that in the People's Republic of China, the 1982 CCP's (Chinese Communist Party) Plenum adopted policies aimed at hindering the development of private businesses to "cut the capitalist tails in all sectors of the economy". However, this situation changed when, in 2007, the People's Congress passed a landmark law recognizing private property rights (He, 2009:45).

In their study on the influence of social network on entrepreneurship participation, Klyver *et al.* (2008:332) mention information; access to finance; access to skills, knowledge and advice; and reputation and credibility, both from a supportive and cooperative perspective, as the most important resources that networks can provide.

Giving credence to the above exposition, Aldrich and Kim (2007:3) highlight that entrepreneurship scholars have embraced the optimistic message conveyed by much of the social network literature; viewing networking as the key to evading constraints on entrepreneurial action. Other scholars (Alder & Kwon, 2002:23; Bastié *et al.*, 2013:866-867; De Carolis, Litzky & Eddleston, 2009:529; Gedajlovic, Honig, Moore, Payne & Wright, 2013:455) also emphasise the importance of social capital as a source of support for venture creation and opportunity discovery, evaluation, and exploitation. Bonnafous-Boucher *et al.* (2011:2) above refer to market conditions (in the form of access to both domestic and foreign markets) as one of the determinants of entrepreneurial performance.

With regard to role models, many entrepreneurs claim that their decisions to start businesses and development of their businesses have been influenced by others who are

entrepreneurs and range from the likes of Steve Jobs, to former colleagues or family members (Bosma *et al.*, 2012:410). These are essentially role models. Antonites (2003:60) contends that, in the entrepreneurial context, potential entrepreneurs are motivated to become entrepreneurs by simply observing another person being successful in business, and that it may even drive this potential entrepreneur to perform better than the role model. Barnir *et al.* (2011:277) exemplify the above arguments by asserting that role models not only provide potential entrepreneurs with opportunities to identify and engage in entrepreneurial activities, but through formal and informal exchange of knowledge and support, actually help them in developing the necessary skills to excel and engage successfully in entrepreneurial events.

Education and training, particularly in the entrepreneurial context, is a vital instrument for instilling requisite skills and knowledge in potential entrepreneurs, including potential agricultural entrepreneurs; as it enables their operations to be productive and profitable (Duval-Couetil, 2013; Lans *et al.*, 2014; Morris *et al.*, 2013).

Government policies, laws and regulations on taxation, labour, private property, company registration and administrative practices that hinder creation of an environment for entrepreneurship development need to be addressed. Access to both domestic- and foreign markets, financial support in the form of subsidies and access to financial products of commercial- and development banks, non-financial support such as incubation, promotion of social capital as a way of networking, are all crucial for entrepreneurship development as attested to by the above-mentioned scholars and institutions. The above factors are critical to the development of the AEDM on which this study is based.

Based on the above discussion, in the context of this study, the construct of supportive environment will be constituted by regulatory framework, financial support, non-financial support, culture, social capital (networking), market conditions, role models and, education and training.

3.8.2 Entrepreneurial orientation (EO)

As Miller (2011:875) states, there have been considerable advances in research since the description by Lumpkin and Dess (1996) of entrepreneurial orientation as being processes

and decision-making activities that lead to new entry; and wherein dimensions such as risk-taking, pro-activeness and innovation were regarded as almost being the only important drivers of EO. Subsequently, there are and have been more attempts to use moderating variables and mediators to ascertain under which organizational and environmental contexts the EO-performance relationship would be the strongest (Miller, 2011:876). Other scholars and researchers (Alegre & Chiva, 2013; Kollmann & Stöckmann, 2014; Van Doorn *et al.*, 2013) are also of the view that the effect of mediating and moderating factors on the EO-performance relationship should be considered.

Other scholars and researchers (George & Marino, 2011; Wiklund & Shepherd, 2011) posit different approaches to the EO-performance relationship. George and Marino (2011:995) suggest that EO be considered a conceptual family of constructs that build on the original three-dimension of innovativeness, pro-activeness and risk-taking. The authors further suggest that EO be conceptualised as a reflective model utilising three dimensions. These could be extended by employing a classical classification scheme identifying subcategories of EO for development, operationalization, and testing by using new measurement items (George & Marino, 2011:989, 1018).

Wiklund and Shepherd (2011:925,937) characterise extant research as "EO-as-advantage", meaning that it pays to pursue an EO. As a new perspective on the EO-performance relationship, they offer "EO-as-experimentation" which reflects the notion that EO is associated with greater outcome variance that could lead to both success and failure. EO has a positive relationship with relative performance among surviving firms, but also has a positive relationship with firm failure. The authors argue that their proposed approach is more consistent with the EO dimensions of innovation, risk-taking and pro-activeness. (Wiklund & Shepherd, 2011:930).

Originally, the term 'innovation' was associated with the selection, development and commercialisation of ideas. Nowadays, however, it includes all activities in the process of technological change such as the realization of new solutions and technological options (Sarri *et al.* (2010:273). Suman *et al.* (2014:6) advocate for the increased use of information technology in agricultural extension as an important tool for enhancing and developing knowledge and skills among the farming community. Marketing of agricultural produce can also benefit greatly from the use of information technology.

In the context of the present study, the EO construct, encapsulating the above measures or indicators, can play an important role in assisting NRP and AALS farmers become agricultural entrepreneurs.

For the purposes of this study, and as informed by literature on models and frameworks on entrepreneurship development, the construct of entrepreneurial orientation will be constituted through technology and innovation, risk-taking and pro-activeness.

3.8.3 Agricultural sustainability (AS)

From a landscape ecological perspective, agricultural sustainability is defined as being concerned with practices that are environmentally sound, economically profitable, and socially just (Dale *et al.*, 2013:1112).

Hall *et al.* (2010:439) contend that sustainable development, although considered controversial for business and policy has emerged as an influential concept, on the backdrop of unsustainable business practices. Therefore, there is a growing awareness for fundamental transformation in the way in which business is conducted in order to reduce detrimental environmental and societal impacts on the ecosystem. Within this context, entrepreneurship is increasingly being recognised as a conduit for bringing about a transformation to sustainable products and processes. It is also regarded as a panacea for many social- and environmental concerns (Hall *et al.*, 2010:439). The above narrative brings to the fore the concept of sustainability-driven entrepreneurship or sustainability entrepreneurs. Parrish (2010:511) asserts, that the latter view enterprises as a means of perpetuating resources, the underlying logic being the use of human and natural resources in a way that enhances and maintains the quality of their functioning for the longest possible period.

The World Bank (2011:20) cautions that, global climate change with increased global temperatures could lead to a drop in agricultural output mostly in tropical countries. Sub-Saharan Africa's agriculture is mostly rain-fed and climate change may hold serious risk for farmers. Consequently, the need for adaptation methods to the changing climate arises. Müller's *et al.* (2011:4313) contention of a compromised agricultural production which is projected to result from climate change, especially in smallholder systems with

little adaptive capacity, and, as is currently the case in many parts of Africa, is in line with the above caution.

Pretty (2008:451) emphasizes the importance of developing technologies and practices with no adverse effects on the environment, but which, nonetheless, lead to improvements in food productivity. Researchers such as Nkambule and Dlamini (2012:4004) encourage the conservation of natural resources, prevention of land degradation and erosion, conservation of biodiversity and ecosystem, and smallholder irrigation as factors that could contribute to agricultural sustainability. With regard to entrepreneurial capacity-building in the context of agriculture sustainability, Mmbengwa *et al.* (2013:2996) posit that such capacity-building programmes should prioritise innovation, risk-taking, financial capacity, and infrastructural capacity.

The provision of agricultural extension services is critical for the sustainability of agricultural activities. Integration of extension elements means that all stakeholders in the extension system such as government agencies, NGOs, farmers' organizations, farmers clubs, private sector agencies, and workers should participate actively in the planning of programmes so as to ensure an integrated extension system (Suman *et al.*, 2014:6).

It is against this backdrop that agricultural sustainability is being increasingly recognised as a necessary condition for improved and sustainable food productivity and food security.

In the context of this study, the construct of agricultural sustainability will be represented by extension services, climate change, the ecosystem, biodiversity and soil erosion.

3.8.4 Entrepreneurial Competencies (EC)

The three components of the proposed conceptual model, forming part of the external environment, intrinsic and vital to the promotion and development of entrepreneurship, are discussed above and illustrated in Figure 3.15, and serve as a backdrop for this study. Entrepreneurial competencies considered to be critical input to entrepreneurial performance can only happen when an environment fosters entrepreneurship. As enunciated above by Antonites (2003), skills development in an entrepreneurial context entails the development of entrepreneurial skills (risk propensity, creativity and innovation,

opportunity identification, role models), performance motivation, and business skills (general management, marketing, legal, operations, human resources management, business management, financial management).

Notwithstanding the above, Morris *et al.* (2013:352; 353) contend that whilst business skills are important, they do not adequately address the unique requirements of the entrepreneurial context. Consequently, they advocate for a unique set of competencies in terms of entrepreneurial action which could be developed alongside business skills. The authors therefore regard entrepreneurship education as an important channel through which students can be moulded into potential entrepreneurs (Morris *et al.*, 2013:356). Entrepreneurial skills are important in a rural context where rural entrepreneurs interact with the institutional regulatory environment and the economic market environment, and need to understand these complex environments. In this vein, Deakins, Bensemann and Battisti (2016:234) suggest a conceptual framework that would aid the development of the skills of these entrepreneurs to manage such complex and important environments that enable entrepreneurial performance.

The critical role which entrepreneurial skills can play in enhancing entrepreneurial performance has been comprehensively expounded on in the preceding sections by various scholars and researchers, inter alia, Hamid *et al.* (2013) on risk-taking; Timmons and Spinelli (2007) on opportunity recognition; Bosma *et al.* (2012) on role models; Shane and Nicolaou (2014) on creativity; Sarri *et al.* (2010) on innovation; and Antonites (2003) on risk propensity; creativity and innovation; opportunity identification and role models.

Technical skills, crucial in the agricultural development context, form part of the proposed conceptual model. A farmer needs to be equipped with a good knowledge of agricultural techniques, commensurate with optimal land use to ensure high yields in crop and livestock production. Moreover, he or she should also possess a good knowledge of agricultural implements and equipment.

Chang (2009:489) posits that agriculture requires better technologies if productivity is to be raised, and that this calls for the improvement of the technical skills of farmers. The author emphasizes the importance of organised research that would produce improved technologies for agriculture. This in turn, will require trained farmers to apply these technologies more efficiently (Chang, 2009: 489). Improved technologies in agriculture

would ordinarily mean improvements in the quality of seed, pesticides, fertilizers, vaccines and antibiotics. It would also mean better soil management in the face of climate change (Chang, 2009:500-502). For this to be applied optimally, farmers need technical skills.

As regards performance motivation, Timmons and Spinelli (2007) and Robichaud *et al.* (2001) suggest that successful entrepreneurs derive satisfaction and self-actualisation from setting challenging goals and then competing against their own self-imposed standards, which they perceive as achievement motivation in action.

St-Jean (2011b:38) defines mentoring or mentorship in an entrepreneurial context as a support relationship between a novice entrepreneur (named mentee) and an experienced entrepreneur (named mentor), where the latter helps the former develop as a person. This happens by pairing up a novice entrepreneur with an experienced entrepreneur who provides counselling in terms of strategic thinking and decision-making in order to avoid costly mistakes by the mentee (St-Jean & Audet, 2012:122).

It is evident from the above narrative that entrepreneurial competencies play a bridging and catalytic role towards entrepreneurial performance. Therefore, in the context of agricultural-entrepreneurial development, enhancing entrepreneurial competencies through entrepreneurship education can be beneficial to NRP and AALS farmers if they are equipped with requisite skills for productive and profitable farming operations.

For the purposes of this study, the construct of entrepreneurial competencies will be constituted by entrepreneurial skills, business skills, technical skills, performance motivation, and mentorship.

3.8.5 Entrepreneurial performance (EP)

The degree and intensity of entrepreneurial performance can be considered a function of the determinants or antecedents of entrepreneurial performance, which in the proposed conceptual model, relate to the environmental factors (external and internal) outlined above. According to Bonnafous-Boucher *et al.* (2011:2) entrepreneurial performance can be measured through a set of traditional economic indicators such as firm creation rate, survival rate, the percentage of enterprises taken over, the size of the Small and Medium

Enterprise (SMEs), and the percentage of SMEs active in the export market. Other scholars and researchers (De Vries *et al.*, 2013; Lucky, 2011; Rauch *et al.*, 2009) regard sales growth, return on investment, innovativeness, growth, profit, size, liquidity, success/failure, and market share as indicators of performance in general, and entrepreneurial performance in particular. In addition, new perspectives offer social capital and financial capital as determinants of entrepreneurial performance (Bastié *et al.*, 2013:865-867).

In the context of this study, indicators of entrepreneurial performance are bound to agricultural practice; hence, the construct of entrepreneurial performance will be formed by growth in agricultural business, competitiveness, and agricultural start-ups. Growth refers to the increase and expansion of agricultural businesses, whereas success/failure refers to the rate of agricultural start-ups or lack thereof. Competitiveness in this context refers to survival ability and market share.

3.8.6 Entrepreneurial outcomes

Cumming and Fischer (2012:467) report that in the process of fostering entrepreneurial activity in their economies, governments in both developed and developing countries are increasingly distinguishing between supporting entrepreneurial activity versus supporting SMEs. Thus the challenge for public policy makers lies in securing means of support that can result in entrepreneurial outcomes such as growth and innovation rather than merely sustaining low-performing SMEs.

Consequently, publicly-funded business advisory services are geared toward fostering entrepreneurial outcomes, through the enhancement of entrepreneurial performance. Advising is a potentially cost effective means of bringing about entrepreneurial outcomes when firms with high growth and innovation intentions are the beneficiaries of such advisory services (Cumming & Fischer, 2013:467, 480).

Against the back drop of this study, entrepreneurial outcomes are understood as by-products of entrepreneurial performance and will be reflected by agricultural productivity, increased incomes, and improved livelihoods of the beneficiary farmers

3.8.7 Monitoring and evaluating entrepreneurial performance

Drawing on the model by Modiba (2009), the proposed conceptual AEDM includes an element of monitoring and evaluation, which is for exploratory research purposes only, and will not form part of inferential statistical testing. It is, however, a very significant intervention as it has been identified by some researchers (Lahiff, 2007, Ministry of Lands and Resettlement, 2010; Werner & Odendaal, 2010) as a major shortcoming of current land reform and land restitution models. In the context of this study, monitoring and evaluation would assess the level and intensity of entrepreneurial performance in order to identify bottlenecks and institute remedial interventions.

In Figure 3.15, the solid line arrows between the constructs constituting the enabling environment and the construct of entrepreneurial performance signify the direction of the causal effect in that relationship. The thick solid line arrow signifies the monitoring and evaluation of entrepreneurial performance.

Table 3.5 summarises the components of the agricultural-entrepreneurial development model.

Table 3.5: Summary of component constructs for agricultural-entrepreneurial developmental model

Construct	Measures/Indicators of the construct	Authors/Contributors to the constructs	Main features of the measures/indicators
Supportive environment	- regulatory framework - financial support - non financial support - culture - social capital (networking) - market conditions - role models - education and training	Gnyawali and Fogel, 1994; Carlsson *et al*, 2013; OECD, 2009; Klyver *et al.*, 2008; Aldrich and Kim, 2007; Alder and Kwon, 2002; De Carolis *et al.*, 2009; Lim *et al.*, 2010; Kiggundu, 2002; Bosma *et al.*, 2012; Antonites, 2003; ; Barnir *et al.*, 2011; He, 2009; Nieuwenhuizen and Nieman, 2009; Suman *et al.*, 2014; Lans *et al.*, 2014.	-Regulatory framework ✓ i.e. tax laws, property laws, -financial support ✓ i.e. subsidies, loans, -non financial support ✓ i.e. counselling, incubation, entrepreneurial networks, tax incentives, information networks, ICT -social capital

Construct	Measures/Indicators of the construct	Authors/Contributors to the constructs	Main features of the measures/indicators
			(networking) ✓ i.e. financial support, information exchange, -market conditions ✓ i.e. access to domestic and foreign markets. -role models ✓ i.e. parents, teachers, employers, friends, work colleagues, - culture ✓ i.e. society, parents, relatives, government, -education ✓ i.e. vocational agricultural education, entrepreneurship education
Entrepreneurial orientation	- technology and innovation - risk-taking - pro-activeness	Miller,2011; Dess and Lumpkin, 1996; Wicklund and Shepherd, 2011; George and Marino, 2011; Suman *et al.*, 2014; Lans *et al.*, 2011; Le Roux and Bengesi, 2014	-technology and innovation ✓ i.e. information communication technology (mobile phones, emails, telephones) -risk taking ✓ i.e. opportunity identification and exploitation, -pro-activeness ✓ i.e. introducing new products and services ahead of competitors.
Entrepreneurial competencies	- entrepreneurial skills	Morris *et al.*, 2013; Hamid *et al.*, 2013;	-entrepreneurial skills ✓ i.e. risk propensity,

Construct	Measures/Indicators of the construct	Authors/Contributors to the constructs	Main features of the measures/indicators
	- business skills -technical skills - performance motivation - mentorship	Shane and Nicolaou, 2014; Sarri *et al.*, 2010; Antonites, 2003; Timmons and Spinelli, 2007; Robichaud *et al.*, 2001; St-Jean, 2011; St-Jean and Audet, 2012.	creativity and innovation, role models, -business skills ✓ i.e. management skills, financial management skills, legal skills, human resources management skills, communication skills -technical skills ✓ i.e. agricultural and land management skills -performance motivation ✓ i.e. need for achievement, need for power, need for affiliation, -mentorship ✓ i.e. experienced entrepreneur and novice entrepreneur,
Agricultural sustainability	- extension services - climate change - ecosystem, biodiversity, soil erosion	Hall *et al.*, 2010; Parrish, 2010; World Bank, 2011; Pretty, 2008; Müller *et al.*, 2011; Nkambule and Dlamini, 2012; Mmbengwa *et al.*, 2012; Suman *et al.*, 2014	-extension services ✓ i.e. telephone infrastructure, technical skills -climate change ✓ i.e. adaptation techniques
Entrepreneurial performance	- growth in agricultural business - competitiveness - agricultural start-ups	Bonnafous-Boucher *et al.*, 2011; De Vries *et al.*, 2013; Rauch *et al.*, 2009; Lucky, 2011	-creation rate, survival rate, market share, profit, sales,
Entrepreneurial outcomes	- agricultural productivity	Cumming and Fischer, 2013	-growth and innovation resulting in increased food

Construct	Measures/Indicators of the construct	Authors/Contributors to the constructs	Main features of the measures/indicators
	- increased incomes - improved livelihoods		productivity, food security that ensures sufficient, safe and nutritious food. –increase in the level of incomes that assures a comfortable livelihood. -improvement of living standards for the recipients.

3.9 SUMMARY

This chapter presented literature on entrepreneurial performance- and agricultural-development frameworks and their respective models. It emerged that no appropriate model on agricultural-entrepreneurial development exists.

Consequently, a general framework on agricultural-entrepreneurial development was formulated to provide an overall guide to the development of the envisaged AEDM. This conceptual model follows a linear approach which presupposes the existence of external and internal environmental factors that create a platform for the enhancement of entrepreneurial performance and entrepreneurship development. According to Covin and Slevin (1991:9), a conceptual model must depict direct- or main effects between the component variables.

Chapter four will address the practical application aspects by transforming the conceptual model into a statistical model. Furthermore, it will discuss instruments which can be used to measure the components of the proposed model.

CHAPTER 4
A MEASUREMENT FRAMEWORK OF AGRICULTURAL-ENTREPRENEURIAL DEVELOPMENT

4.1   INTRODUCTION

Chapter three highlighted the need for a model that catalyses entrepreneurship and entrepreneurial performance in the agricultural sector. In some instances, the literature offers entrepreneurial frameworks for enhancing the agricultural sector, but these do not translate into empirically tested and validated models.

The conceptual model advanced in this study and illustrated in chapter three will be transformed into a statistical model for the purposes of empirical testing and validation. Therefore, the purpose of chapter four is to transform the conceptual model into a statistical model. In so doing, literature on measurement instruments, namely, for the constructs of the conceptual model as depicted in Figure 3.15, will be reviewed. Measurement instruments for a supportive environment; entrepreneurial orientation; agricultural sustainability; entrepreneurial competencies; entrepreneurial performance; and entrepreneurial outcomes, will be reviewed. This will be followed by the development of measurement instruments for each of the constructs, as informed by literature review in this regard. The structural model for empirical data analysis will also be developed.

The paragraphs that follow review literature on measurement instruments of the constructs in the conceptual model.

4.2   LITERATURE REVIEW ON MEASURING INSTRUMENTS

This chapter focuses specifically on identifying measurement instruments for each of the constructs in the conceptual AEDM. This will enable the data collection and analysis phases to take place. In order to achieve this objective, a literature search was conducted of measurement instruments measuring the constructs of the conceptual AEDM. The criteria for adoption of measurement instruments were:

- Internal consistency: internal consistency is an estimator of reliability. Reliability is defined as the ability of an instrument to measure consistently, and internal consistency describes the extent to which all the items in a test measure the same concept or construct (Tavakol & Dennick, 2011:53; Welman, Kruger & Mitchell, 2012:145-147). Conbrach's alpha developed by Lee Conbrach in 1951, is one of the most popular method used to provide a measure of the internal consistency of a scale or test. A Conbrach alpha of 0.70 is regarded as representing acceptable reliability (Santos, 1999:1; Tavakol & Dennicj, 2011:54).

- Internal validity: internal validity is an estimator of validity, and concerns the measurement instrument's ability to measure what it is purported to measure (Cooper & Schindler, 2008:289). Content validity concerns the extent to which the measurement instrument adequately covers the investigative questions which guide the study. Construct validity concerns the degree to which the operational definition of the construct is empirically grounded in theory, and that the measuring instrument produces results that mirror other measurement instruments measuring the same construct or object (Cooper & Schindler, 2008: 289-291).

This study considers only those measures or scales that have a bearing on the constructs of the conceptual AEDM.

4.2.1 Measurement instruments for supportive environment

In the context of this study, the construct of supportive environment is constituted by indicators such as: regulatory framework; financial support; non-financial support; social capital (networking); market conditions; culture, role models; and education and training.

Manovola, Eunni and Gyoshev (2008:203) sought to validate an instrument measuring a country's institutional profiles for the promotion of entrepreneurship in the three emerging economies of Bulgaria, Hungary and Latvia, empirically. The reason being that empirical research has, to date, not devised valid scales for measuring the complex effect of the institutional environment necessary for unlocking entrepreneurial phenomena within emerging economies (Manovola, *et al.*, 2008:204). On validating an instrument developed by Busenitz, Gomez and Spencer (2000) to measure a country's institutional profile for the

domain of entrepreneurship in the above-mentioned emerging economies, the authors found that it compares favourably with Busenitz *et al.*'s (2000) model in terms of factor loadings, scale reliabilities and goodness-of-fit indicators. The results showed high reliabilities, internal consistency, and construct validity. An average Conbrach alpha of 0.79 for the three dimensions was achieved. The results also suggest that Busenitz *et al.*'s (2000) instrument, although designed for profiling institutional environments in industrialised countries, is also valid for emerging economies in Eastern Europe (Manovola *et al.*, 2008:210-211).

Manovola *et al.*'s (2008) measurement instrument as constituted by the regulatory dimension, cognitive dimension, and normative dimension, contains items that capture indicators of the regulatory framework which highlight financial support, non-financial support, culture, role models, education and training, market conditions, and social capital. This measurement instrument will be drawn upon in designing a measurement instrument for the construct of supportive environment.

4.2.2 Measurement instruments for entrepreneurial orientation

In the context of this study, entrepreneurial orientation comprises the indicators or dimensions of technology and innovation; risk-taking; and pro-activeness.

The following section reviews literature on a measurement instrument for entrepreneurial orientation, which forms part of the proposed conceptual AEDM.

In studies by various authors on EO, the dimensions of innovativeness, risk-taking and pro-activeness were measured using scales developed and tested for reliability by Miller (1983) and Covin and Slevin (1989). The scales were supplemented by items which were developed to capture aspects of the constructs that were not included in the scales used previously (Lumpkin & Dess, 2001:439). The Covin and Slevin scale achieved an inter-item reliability coefficient of above 0.70 on the constructs of their study. Miller and Friesen (1982) also developed a measurement instrument for the dimensions of product innovation and risk-taking (Miller & Friesen, 1982:85-86). An average Conbrach alpha of 0.74 was realised; thereby confirming reliability of the construct (Miller & Friesen, 1982:7).

The dominance and popularity of the above measurement scales for EO are confirmed by Covin and Wales (2012:678) who state that despite the scrutiny to which these scales were subjected, little progress has been made in the development of new approaches to EO's measurement. Le Roux and Bengesi (2014:611) also used measurement scales developed by Covin and Slevin (1989) and Lumpkin and Dess (2001) to measure the dimensions of risk-taking, pro-activeness, and competitive aggressiveness, albeit with adaptations.

For the purposes of the present study, the above-mentioned measurement scales will be relied upon when designing the measurement instrument for EO.

4.2.3 Measurement instruments for entrepreneurial competencies

In the context of this study, the construct of entrepreneurial competencies will be constituted by entrepreneurial skills, business skills, technical skills, performance motivation, and mentorship. Unger, Rauch, Frese and Rosenbusch (2011) adopt a meta-analytical approach to integrate results from three decades of human capital research in entrepreneurship. Effect sizes were determined and based on Pearson product-moment correlations (r). In order to estimate the overall relationship between human capital and entrepreneurial success, a sample weighted average effect was computed across all studies. The criterion for inclusion is that the studies were required to report a correlation between an indicator of human capital and a measure of entrepreneurial success (Unger *et al.*, 2011:346, 350).

According to Unger *et al.* (2011:343), individuals can acquire human capital such as skills and knowledge, through schooling, on-the-job training, and other methods of learning. The authors posit that human capital is of utmost importance to success if it consists of current task-related knowledge and skills. In this context, it relates to the owner experience, start-up experience, industry experience, and entrepreneurial knowledge of the business owner. General education and employment experience, non-task-related human capital, do not relate to current tasks of the business owner. A further distinction is that of human capital investments such as education and work experience on the one hand, and the outcomes

of human capital investments such as knowledge and skills, on the other (Unger *et al.*, 2011:343-344).

While the results confirm the existence of a positive relationship between human capital and entrepreneurial success, the correlations were higher for outcomes of human capital (knowledge and skills) and also for human capital related to entrepreneurial tasks. Unger *et al.* (2011:354) suggest that entrepreneurial success be predicted with task-specific human capital and outcomes of human capital given the fact that it is context specific (Unger *et al.*, 2011:354).

Brush and Changati (1998) examined the influence of human and organizational resources on performance. The measurement variable or dependent variable, which in this case is performance, was measured by cash flow and log of growth in employees over three years (Brush & Changati, 1998:234).

It was found that human capital, particularly education of the owner-founder had a bearing on growth. Commitment and determination of the owner-founder was related to personal satisfaction and the continuation of the venture (Brush & Changati, 1998:237). The authors focused on two types of human resources, namely the founder-owner's human capital as comprising industry experience, business education, and the owner-founder's attitudes toward running their businesses (Brush and Changati, 1998:238).

Founder-owner's human capital was measured by business education, and the industry experience was measured in years of experience worked in the same industry. Founder-owner's business attitude was measured by agreement/disagreement with a 5-point scale using seven items (Brush & Changati, 1998:242). Validity of the variables in the study was done through factor analysis on all individual items together. Multivariate analysis of variance (MANOVA) was used to determine whether there were significant differences in resources, strategies and performance across firm size and age groups.

The results indicate that, the combination of owner resources, commitment, and organizational resources were very important to positive cash flow for very small companies in the service and retail sectors. Young service and retail businesses, however, considered the important factor affecting employment increases, as being growth in the industry (Brush & Changati, 1998:253).

Brush and Changati's (1998) study contains variables on human capital (such as business education) which may be relevant in the design of the measurement instrument for the construct of entrepreneurial competencies contemplated in the conceptual AEDM.

Robichaud *et al.* (2001) developed an instrument to measure the perceptions entrepreneurs have of their entrepreneurial goals. The authors acknowledge that the majority of the models for the study of entrepreneurial performance emphasise motivation as one of the key elements in the success of small business (Robichaud *et al.*, 2001:189). Their study found that entrepreneurs, through business ownership, strive for entrepreneurial motivation as their objective. This in turn determines the patterns of an entrepreneur's behaviour.

Robichaud *et al's.* (2001:195) measurement instrument contains four motivational factors: autonomy and independence (5 items); security and wellbeing of the family (4 items); extrinsic motivators (4 items); and intrinsic motivators (4 items). Sales, profit and funds drawn from the business are used as measurement indicators. The results indicate that the measurement instrument complies with requirements in terms of construct validity, content validity, predictive validity, and internal consistency or reliability. An average Conbrach alpha of 0.78 was achieved for the four variables or factors.

For the purposes of this study, the measurements and findings by Brush and Changati (1998), Robichaut *et al.* (2001), and Unger *et al.* (2011) are important for designing the measurement instrument for entrepreneurial competencies. Variables such as outcomes of human capital (knowledge and skills – which could include entrepreneurial skills and technical skills), business education, and performance motivation (autonomy, independence, security of the family) correspond to the indicators of entrepreneurial competencies in the conceptual AEDM. They can be relied upon for the design of the measurement instrument for this construct.

4.2.4 Measurement instruments for entrepreneurial performance

The construct of entrepreneurial performance will be represented by growth in agricultural business; increased competitiveness; and growth in agricultural start-ups in the context of the present study.

Murphy *et al.* (1996:15) emphasise the importance of accurate performance measurement in order to understand new venture and small business success and failure. The authors present a two-phase examination of performance measurement in entrepreneurship firstly by examining 51 published entrepreneurship studies that use performance as the dependent variable, and secondly by using data from a sample of small businesses to analyse some of the popular objective performance measures (Murphy *et al.*, 1996:15).

Murphy *et al.'s* (1996:17) study presents dimensions and their measures used in performance measurement: (i) efficiency as measured by, inter alia, return on investment, return on equity, return on assets, return on net worth, and internal rate of return; (ii) growth as measured by, among others, change in sales, change in employees, market share growth, change in net income margin, and change in labour expense to revenue; (iii) profit as measured by ,among others, return on sales, net profit margin, gross profit margin, and pre-tax profit as some of the popular dimensions and their measures used in performance measurement. However, their study laments the lack of construct validity for performance and the overreliance on financial measures of performance. In line with Venkatraman and Ramanujam (1986), the authors suggest the inclusion of multiple dimensions and multiple measures because performance in its totality cannot be measured by financial measures alone (Murphy *et al.*, 1996:22).

Naldi and Davidsson (2013) investigate the impact of knowledge acquisition from international markets on entrepreneurial growth. The authors stress the necessity of distinguishing between forms of growth, which to a greater or lesser extent, reflect entrepreneurial activities, and define entrepreneurial growth as growth through the launch of new products or services and/or through expansion into new geographic markets be it domestically or abroad (Naldi & Davidsson, 2013:2). In the context of this study, the notion of entrepreneurial growth may be equated with growth or expansion of agricultural activities owing to an entrepreneurial approach to agriculture. Naldi and Davidsson (2013:7) focus on sales as the measurement indicator or variable for entrepreneurial growth for the mere reason that it is the most comparable and commonly used in prior studies. The authors measured acquisition of knowledge with eight statements which reflect the market and technological know-how that the SMEs have acquired from their international activities (Naldi & Davidsson, 2013:7).

Powell and Eddleston (2013) examined how the experiences of entrepreneurs in their family domain could benefit their experiences in their business domain. According to these authors, entrepreneurial success can be measured by economic measures such as business performance and employment growth, whilst satisfaction with status and satisfaction with employee relationships, measured the construct of satisfaction within the entrepreneurial experience (Powell & Eddleston, 2013:261).

Man and Chan (2002) in their study of competitiveness of small- and medium enterprises (SMEs), which adopted the competency approach to competitiveness, built a conceptual model to link the characteristics of small- and medium-sized enterprises' owner-managers and their firms' performance . The authors regard competitiveness as being concerned with long-term performance and with factors leading to being competitive such as, the industry in which it operates, its cost advantage, and the prevalent socio-political environment. Man and Chan (2002:126) suggested the application of a threefold measure of competitiveness as consisting of competitive performance, competitive potential, and management processes. These measures are interrelated and interdependent. This implies that competitiveness is a multidimensional construct involving the potential (capability) to sustain performance, which in turn, leading to improvement of the management process, and ultimately the creation of potential (Man & Chan, 2002:127).

For the purposes of this study, the notion of growth in market share expounded by Murphy *et al.* (1996) can be equated to growth in agricultural business and agricultural start-ups. Entrepreneurial growth as presented by Naldi and Davidsson (2013) can be understood as the expansion of agricultural activities including agricultural business and agricultural start-ups growth. Competitiveness as described by Man and Chan (2002) is understood to mean increased competitiveness as in the conceptual AEDM.

4.2.5 Measurement instrument for agricultural sustainability

In the context of the present study, the construct of agricultural sustainability will be constituted by extension services, climate change, and ecosystem, biodiversity and soil erosion.

A measurement instrument for sustainable agricultural management or development was developed. It focuses on measuring the role of information systems in environmental performance in agriculture (Wijesooriya, Heales, Xu & Clutterbuck, 2014:1). Environmental management systems increasingly rely on information systems, and the proper management of the environment is considered imperative to sustainable agricultural development. Suman *et al.* (2014) recommend suitable and innovative extension services that make extensive use of information technology.

The measurement instrument development involved an item creation, namely, a list comprising 47 items measuring environmental performance; a scale development that involved creating a set of valid constructs; and measurement instrument testing. Validity of the construct was evaluated by way of inter-rater agreement where a free Kappa coefficient of 0.74 and the item placement ration of 86 per cent were achieved. These indicated a substantive agreement between the judges, and therefore high construct validity. A Conbrach alpha of 0.92 was achieved for measurement instrument reliability (Wijesooriya *et al.*, 2014: 9).

In an effort to address soil erosion, biodiversity and ecosystem degradation, Rigby, Woodhouse, Young and Burton (2001) constructed a farm-level indicator of agricultural sustainability in relation to organic and conventional farming in horticulture. The indicator considers patterns in the use of inputs such as pesticides, herbicides, and fertilizers, which are widely used owing to the increasing shift towards organic farming, especially in Europe and the USA (Rigby *et al.*, 2001:463). The indicator of sustainable agricultural practice (ISAP) relates to five aspects of horticultural production, namely, seed source; pest disease control; weed control; and maintenance of soil fertility (Rigby *et al.,* 2001:466).

In assessing the impact of farming practices on farm sustainability, Rigby *et al.* (2001:468) focused on criteria resulting in increased yields and reduced losses. The criteria encapsulate the minimization of off-farm inputs; the maximum use of natural biological processes; the curtailing of inputs from non-renewable sources; and the promotion of local biodiversity. Analysis of variance (ANOVA) confirmed significant differences in scores for organic and conventional production, with F value of 943.88, and critical value of 3.84 at the 5 per cent level.

For the purposes of this study, the above, hold lessons for sustainable agriculture in terms of an agricultural extension system, which is based on a robust information technology system, and prudent management of the soil, biodiversity and the ecosystem, and adaptation to climate change.

4.2.6 Measurement instrument for entrepreneurial outcomes

In the present study, the construct of entrepreneurial outcomes, understood to be a by-product of entrepreneurial performance, will be constituted by agricultural productivity, increased incomes, and improved livelihoods.

The study by Yusuf (2010) proposes two frameworks with the aim of understanding entrepreneurial outcomes and how the use of the appropriate outcome will greatly assist in policy decisions and implementation (Yusuf, 2010:326).

The first framework organizes the various measures along the dimensions of time and performance, and suits situations where researchers or policymakers need to select a few representative outcome measures. The second framework adopts the lifecycle approach to defining different outcomes as transition points between the stages in the lifecycle, and suits situations where researchers and policymakers are interested in the outcomes of specific phases of the entrepreneurial lifecycle (Yusuf, 2010:335).

The present study chooses the first framework because of its focus on time and performance, since entrepreneurial outcomes are understood to be a function of entrepreneurial performance. Yusuf (2010:329-330) offers the following measures of entrepreneurial outcomes which have a close resemblance to the ones depicted in the conceptual AEDM: standards of living mean the same thing as improved livelihoods; growth means the same as agricultural productivity; and income generation mirrors increased incomes.

Section 4.2 reviewed literature on current measurement instruments of constructs with similarities to the constructs of the conceptual AEDM. The finding was that there were elements and/or indicators which could be used in designing measurement instruments for the constructs of the AEDM.

The measurement instrument by Manovola *et al.* (2008) contains elements or indicators with similarities to the indicators of the construct of supportive environment in the conceptual AEDM.

The three dimensions of EO, namely, innovativeness, risk-taking, and pro-activeness are measured with items derived from the measurement scales developed by Covin and Slevin (1989), Miller (1983), Lumpkin and Dess (2001), and Miller and Friesen (1982).

The construct of entrepreneurial competencies is measured with items derived from measurement instruments developed by various authors. Unger *et al.* (2011) developed an instrument relating to human capital such as knowledge and skills; Brush and Chingati (1998) relating to human capital represented by business education; Robichaud *et al.* (2001) relating to entrepreneurial motivation such as autonomy and profit; Antonites (2003) relating to entrepreneurial skills, business skills, performance motivation; Chang (2009) relating to technical skills; and St-Jean (2011a) relating to mentorship.

Entrepreneurial performance is measured by items derived from Murphy *et al.* (1996) on growth and profit; Naldi and Davidsson (2013) relating to entrepreneurial growth which can be equated to growth or expansion of agricultural activities; Man and Chan (2002) relating to competitiveness.

Entrepreneurial outcomes is measured by items derived from Yusuf (2010) relating to standard of living (improved livelihoods); growth (agricultural productivity); and income generation (increased incomes).

The section which follows reviews literature on statistical modelling as part of transforming the conceptual AEDM into a model which can be measured and validated.

4.3   REVIEWING LITERATURE ON STATISTICAL MODELLING

Aalen, Roysland and Gran (2012:831) assert that in recent years causality has become a major issue in statistics, and whereas statisticians tended to be silent on the issue there is now a surge of interest and a feeling that statistical analysis should confront causal issues more actively. According to Hair, Black, Babin, Anderson and Tatham (2006:720),

causation, which presupposes a dependence relationship where a cause-and-effect relationship is hypothesized, should be anchored on strong theoretical support.

Causality is a key component of statistical modelling. There are a number of multivariate techniques which can be used in statistical modelling. For the purpose of this study, Structural Equation Modelling (SEM) is adopted. SEM is appropriate because it tests the robustness of a theoretical model based on empirical data. Hair *et al.* (2006:711) define SEM as a family of statistical models which seek to explain the relationships among multiple variables or constructs. Berkout, Gross and Young (2014:217) consider SEM to be a broadly applicable set of statistical techniques allowing researchers to formulate constructs of interest precisely. Furthermore, it measures the extent to which data are consistent with a proposed conceptual model, and to adjust for the influence of measurement error. Ullman and Bentler (2012:661) define SEM as a collection of statistical techniques that allow a set of relationships between one or more independent variables (IVs), either continuous or discrete, and one or more dependent variables (DVs), either continuous or discrete, to be examined. It is also referred to as causal modelling, causal analysis, simultaneous equation modelling, path analysis, and analysis of covariance structures, or confirmatory analysis (Ullman & Bentler, 2012:661).

In SEM, relationships among constructs and indicators (or variables) are demonstrated by way of path diagrams. Indicators are represented by squares or rectangles, whereas constructs (or factors) are represented by circles or ovals in path diagrams. A hypothesized direct causal relationship between the variables is indicated by a line with an arrow (Berkout *et al.*, 2014:219; Ullman & Bentler, 2012:661, 663).

SEM can be distinguished from the other multivariate techniques owing to its ability to estimate a series of separate, yet interdependent, multiple regression equations simultaneously by specifying the structural model used by the statistical programme (Hair *et al.*, 2006:711). It answers questions that involve multiple regression analyses of factors (Ullman & Bentler, 2012:661). A distinct advantage of SEM is its ability to test construct-level hypotheses at a construct level, and to test both direct and indirect effects between constructs (Ullman & Bentler, 2012:663, 673).

Constructs, unobservable or latent, exist only if it has been determined that the variables that are theoretically considered to be part of a given construct, explain a common

variance. The model domain needs to be defined at the outset, in that the endogenous constructs and exogenous constructs need to be specified first (Chathoth (2001:55).

According to Hair *et al* (2006:713), exogenous constructs are the latent, multi-item equivalent of independent variables, whereas endogenous constructs are the latent, multi-item equivalent of dependent variables. The latter are theoretically determined by variables within the model. Their dependence on other constructs mean that the path will be from an exogenous construct to an endogenous construct or from one endogenous construct to another endogenous construct (Hair *et al.*, 2006:713). Exogenous variables begin the causal sequence (Bordens & Abbott, 2011:493).

Unlike path analysis where path coefficients are derived by using multiple regression analysis, SEM uses specialised statistical techniques such as LISREL (linear structural relations) to derive coefficients (Bordens & Abbott, 2011:495). Detailed description of these techniques will be provided in chapter five under methodology.

The SEM consists of two parts, namely the measurement model and the structural model. Literature on the two parts is reviewed in the sections below.

4.3.1 Measurement Model

The measurement model specifies the causal relations between the observed variables or indicators and the underlying latent variables or theoretical constructs, presumed to determine responses to the observed measures (Anderson & Gerbing, 1982:453). The measurement model specifies the relationship between constructs and measures, and that constructs cause scores to be received on each measure because they are observed through the measures or indicators (Berkout *et al.*, 2014:219; Diamantopoulus, Riefler & Roth, 2008:1204; Ullman & Bentler, 2012:662). Anderson and Gerbing (1982:453) argue that distinguishing between measurement and structural models is necessary because the proper specification of the measurement model renders meaning to the analysis of the structural model.

Two types of measurement models can be distinguished. These are the reflective measurement model and formative measurement model (Figure 4.1), both being uni-

dimensional. The distinction between formative and reflective measures is important because proper specification of the measurement model is necessary to assign meaningful relationships in the structural model (Coltman, Devinney, Midgley & Venaik, 2008:1251).

Diamantopoulos and Siguaw (2006:263) describe reflective measurement models as a situation where indicators are seen to be functions of the latent variable or construct, whereby changes in the latent construct are reflected (manifested) in changes in the observable indicators. With reflective (or effect) measurement models, causality flows from the latent construct to the indicator (Coltman *et al.*, 2008:1250; Diamantopoulos & Winklhofer, 2001:269; MacCallum & Browne, 1993:533; MacKenzie, Podsakoff & Jarvis, 2005:711). The indicators in this type of measurement model share a common theme, are interchangeable, and should be highly correlated with high levels of internal consistency reliability (Bollen & Lennox, 1991:307; Coltman *et al.*, 2008:1253; Diamantopoulus *et al.*, 2008:1205; Diamantopoulos & Winklhofer, 2001:271; MacKenzie *et al.*, 2005:711).

Figure 4.1: Reflective and Formative Measurement Models
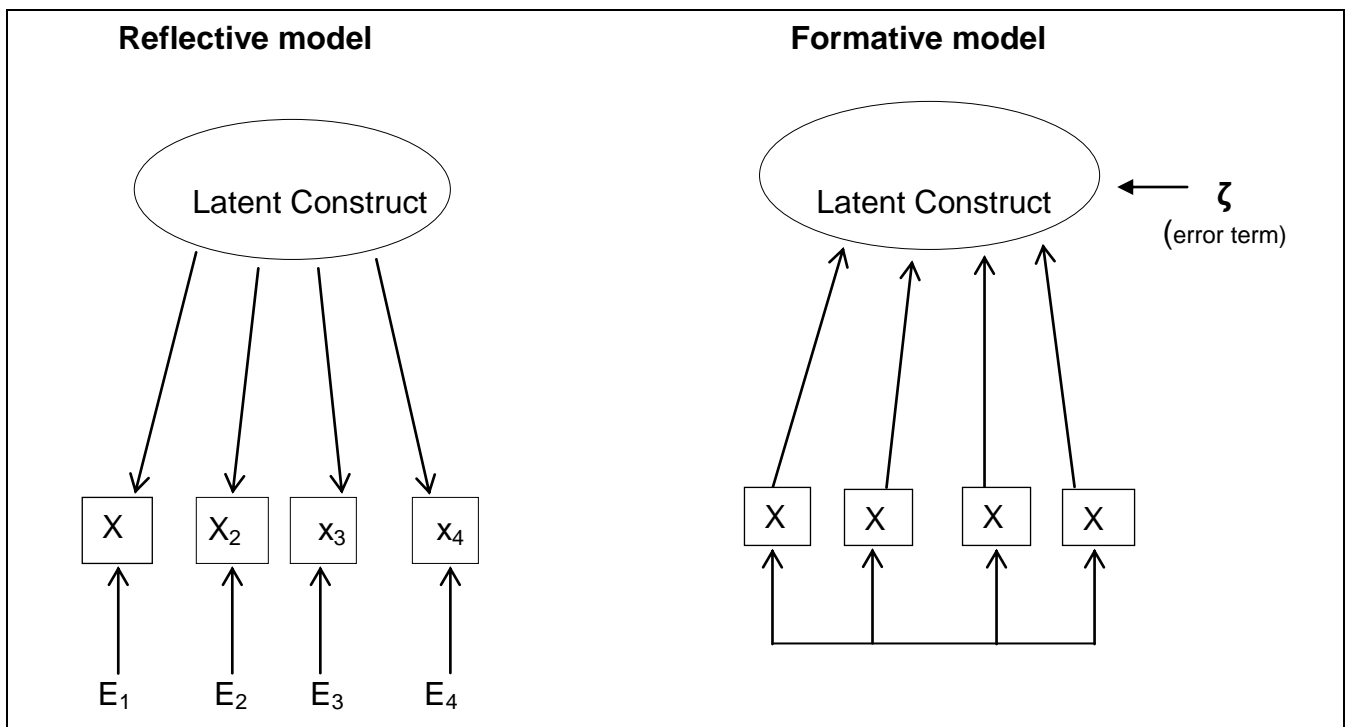
Source: Adapted from Coltman *et al.* (2008:1253) and MacKenzie, Podsakoff & Jarvis (2005:711).

Researchers can, therefore, use statistics such as factor loading and communality, Cronbach alpha and internal consistency to assess the individual and composite

reliabilities of their indicators empirically. These are inappropriate when using formative measurement models where high inter-correlation is not assumed (Coltman *et al.*, 2008:1253).

Diamantopoulus and Siguaw (2006:263) describe formative measurement models as a situation where the latent construct is a function of the indicators, and whereby changes in the indicators determine changes in the value of the latent construct rather than the other way round. This view is exemplified by Cotlman *et al.* (2008:1252) who posit that the latent construct is formed and is a combination of its indicators. Therefore, variation in the indicators causes variation in the latent construct and it follows that causality flows from the indicators to the latent construct. There is no correlation and interchangeability assumed for indicators in a formative measurement model (Bollen & Lennox, 1991:307; Coltman *et al.*, 2008:1252; Diamantopoulus *et al.*, 2008:1205; Diamantopoulos & Winklhofer, 2001:269, 271; MacCallum & Browne, 1993:533; MacKenzie *et al.*, 2005:712).

Both the reflective and formative measurement models include an error term. Unlike the reflective measurement model where the amount of error is attributable to each individual indicator or measure, in the formative measurement model, error is represented at the construct level and captures the invalidity of the set of measures caused by measurement error, interactions among the measures, and/or aspects of the construct domain not represented by the measures. It does not represent measurement error - it is a disturbance term (Berkout *et al.*, 2014:219-220; Coltman *et al.*, 2008:1254; MacKenzie *et al.*, 2005:712).

Another important aspect to note in a formative measurement model is that the consequences of dropping an indicator are more damaging in terms of altering the meaning of the latent construct than would be the case in a reflective measurement model. The reason being that the indicators in a formative measurement model capture the latent construct as a group, whereas in a reflective measurement model indicators individually tap the latent construct, as illustrated by arrows pointing towards the indicators in the formative model in Figure 4.1 (Bollen & Lennox, 1991:308; MacKenzie *et al.*, 2005:712).

As regards indicator relationships with construct antecedents and consequences, indicators in a reflective measurement model should all have the same antecedents and consequences because they all reflect the same underlying construct and are supposed to

be conceptually interchangeable and highly correlated. Indicators in a formative measurement model would not necessarily be expected to have similar antecedents and consequences since they are not interchangeable and correlated (Coltman *et al.*, 2008:1254; MacKenzie *et al.*, 2005:713).

MacKenzie *et al.* (2005:713), nonetheless, highlight the importance of recognizing that conceptual definitions of constructs are often specified at a more abstract, second-order level, with multiple first-order sub-dimensions serving as reflective indicators. It is therefore possible for a multi-dimensional construct to have one type of measurement model relating its measures or indicators to its first-order sub-dimensions and a different measurement model relating its sub-dimensions to the second-order latent construct they represent. It is also possible for a construct to have a mixture of some reflective and some formative indicators at either first-order or second-order level (MacKenzie *et al.*, 2005:713). Figure 4.2 below illustrates a multidimensional configuration of reflective and formative measurement models.

Figure 4.2: Multidimensional reflective and formative measurement models
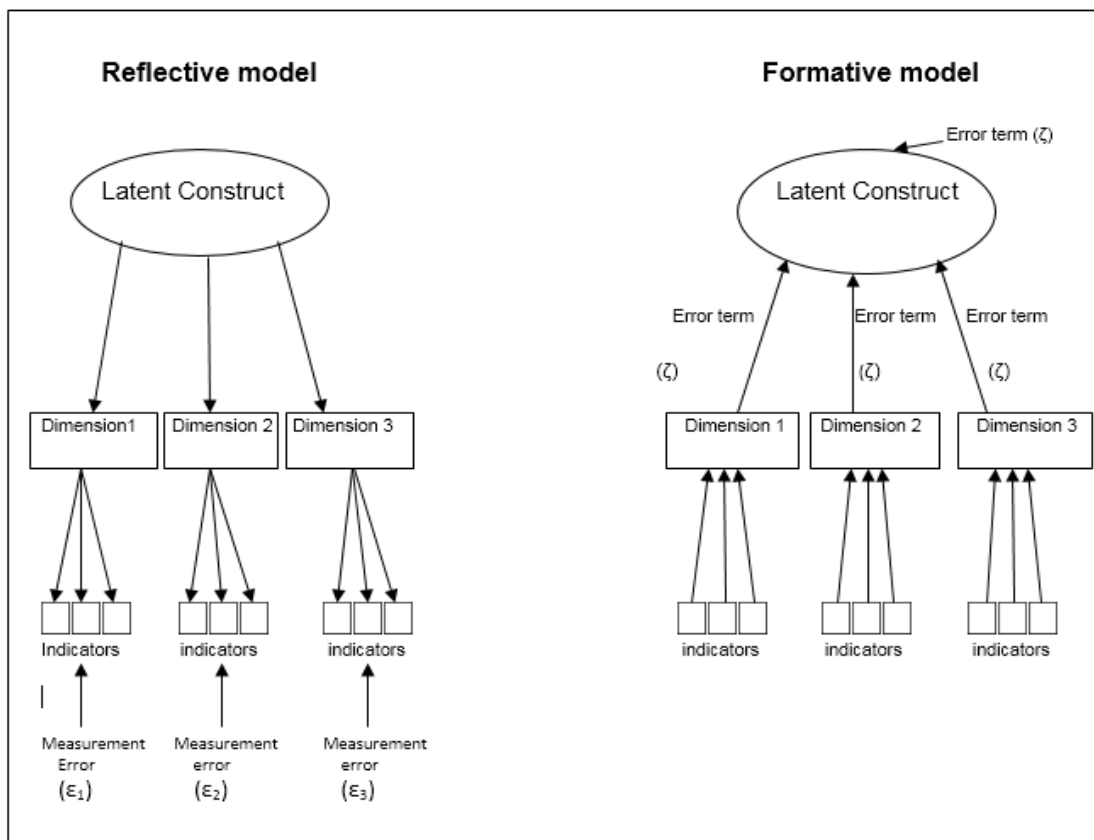
Source: Adapted from MacKenzie *et al.* (2005: 714, 715) & Wörgötter (2011:157).

As in uni-dimensional reflective measurement model, error in a multidimensional reflective measurement model is captured at indicator level, whereas in a multidimensional formative measurement model, error is captured at construct level.

The next section will review literature on assessing the validity and reliability of a measurement model.

4.3.1.1 Assessing measurement model validity

Hair *et al.* (2006:745) opine that measurement model validity depends on goodness-of-fit (GOF) for the measurement model and specific evidence of construct validity. GOF is a measure of how well the specified model reproduces the covariance matrix among the indicator or measurement items – for instance, to what extent the observed and estimated covariance matrices are similar. The closer the values of these two matrices are to each other, the better the model is said to fit (Hair *et al.*, 2006:745). The difference in the covariance matrices ($S - \Sigma_k$) is the key value in assessing the GOF of any SEM model. A chi-square (x^2) test provides a statistical test of the resulting difference (Hair *et al.*, 2006:745).

Diamantopoulos *et al.* (2008:1215) acknowledge that validity assessment is one of the most controversial issues in formative measurement literature, whilst other researchers such as Rossiter (2002:315) dismiss the notion of validity assessment for formative indicators, claiming a set of distinct components as decided by expert judgement, is all that is required.

Diamantopoulos *et al.* (2008:1215) argue that the γ-parameters, which reflect the impact of the formative indicator on the latent construct, indicate indicator validity. This basically means that because the γ-parameters capture the contribution of the individual indicator to the latent construct, those items with limited or non-significant γ-parameters should be considered for elimination as they cannot represent valid indicators of the latent construct. This is based on the assumption that multicollinearity is a non-issue (Diamantopoulos *et al.*, 2008:1215). An alternative or additional approach for assessing indicator validity would be to estimate the indicators' correlations with an external variable. In this way, indicators

showing high correlations with the external variable are retained and those with low correlations with the external variable are considered for elimination (Diamantopoulos *et al.*, 2008:1215).

Validity assessment of business constructs began to be taken seriously in the classical test theory era, making the assumption that classical test theory makes about the relationship between a construct and its indicators, namely, that the observed scores for the measures of a construct are a function of a latent true score, plus random error (Finn & Wang, 2014:2822).

As for construct validity in formative measurement models, various scholars and researchers (Diamantopoulos & Siguaw, 2006; Diamantopoulos & Winklhofer, 2001; MacKenzie *et al.*, 2005) propose various approaches to assessing the validity of construct in this context. The approaches range from nomological validity and criterion validity to using the variance of the error term as an indication of construct validity; given that it captures aspects of the construct's domain that the set of indicators neglect (Diamantopoulos *et al.*, 2008:1216).

4.3.1.2 Assessing measurement model reliability

In a formative measurement model, because the measures or indicators are not hypothesized to be caused or determined by the latent construct, the model itself does not assume or require correlation among the measures. It follows therefore, that internal consistency reliability is not an appropriate standard for evaluating the adequacy of the measures in formative models (Diamantopoulos *et al.*, 2008:1215; Finn & Wang, 2014:2822; MacKenzie *et al.*, 2005:712).

The contrary is true of reflective measurement models, given the fact that the indicators should be highly correlated as they all reflect the same underlying construct, and should, therefore, exhibit high levels of internal consistency reliability (Finn & Wang, 2014:2822; MacKenzie *et al.*, 2005:711).

4.3.1.3 *The consequences of measurement model misspecification*

MacKenzie *et al.* (2005:716) posit that the specification of the measurement model is a critical decision that needs to be made on the basis of conceptual criteria, which is well-grounded in theory. The authors cite the composite latent construct of transformational leadership as an example of a construct with formative indicators that should be modelled, given that it is conceptualised as a function of charisma, idealised influence, inspirational leadership, intellectual stimulation, and individualised consideration. These forms of leadership behaviour are conceptually distinct, and likely to have different antecedents and/or consequences, which are not interchangeable.

Factors requiring careful consideration by researchers in order to avoid misspecification of the measurement model are: (i) the relationships between constructs and their indicators. That is, researchers should ensure that these relationships are correctly modelled; and (ii) recognise that some of the procedures for developing and evaluating constructs with reflective indicators cannot be used for constructs with formative indicators (MacKenzie *et al.*, 2005:729).

The bottom line is that a misspecified measurement model bears undesirable effects on the substantive interpretation of the structural model relationships (Diamantopoulos *et al.*, 2008:1210).

As elucidated earlier, SEM consists of two parts; the measurement model and the structural model. The next section expounds the structural model.

4.3.2 **Structural model**

Whilst the measurement model involves assigning indicators to the constructs they should represent, specifying the structural model involves assigning relationships from one construct to another construct based on the proposed conceptual/theoretical model (Hair *et al.*, 2006:754). The structural model refers to the hypothesized relationships among the constructs (Ullman & Bentler, 2012:662). It also makes a distinction between exogenous and endogenous variables or constructs as stated in Hair *et al* (2006) above. Causal paths

flow from the exogenous construct to the endogenous construct and not vice-versa, but they could also flow from one endogenous construct to another (Hair *et al*, 2006:713).

Kline (2011:106) distinguishes two types of structural models, namely, recursive model and non-recursive model. The recursive model is the most straightforward and is characterised by uncorrelated disturbance terms and unidirectional causal effects whereas the non-recursive model has correlated disturbance terms and can have feedback loops. In corroborating this fact, Ullman and Bentler (2012:666) state that among recursive latent dependent variables (DVs) there are no feedback loops or correlated disturbances (errors), whilst non-recursive latent DVs have feedback loops given that they predict each other, and correlated disturbances are prevalent. A recursive model is preferred for this study because it is the most straight-forward, its disturbances are uncorrelated, and all causal effects are unidirectional – for instance, no observed variable is represented as both a cause and effect of another variable be it, direct or indirect (Kline, 2011:106).

Hair *et al*. (2006:755) state that the SEM model requires that both measurement and structural models, although initially specified separately, constitute a complete model which can be submitted for empirical testing in the final analysis.

The focus of the next section will be on formulating the measurement and structural model for agricultural-entrepreneurial development based on the conceptual model in Figure 3.15, and as was informed by literature review.

4.4   THE AEDM

The present chapter aims to transform the conceptual AEDM into a statistical model in order to facilitate the model's empirical testing and validation. The above model is being developed as a tool to help overcome the shortcomings and challenges identified in the land reform programme in the study's geographical scope, and to contribute to a theoretical model that integrates agricultural development with entrepreneurship and the necessary enabling environments successfully.

The sections that follow describe the measurement and structural models constituting the AEDM.

The development of measurement and structural models in this study draws on the approaches in the literature (e.g. Coltman *et al.*, 2008; MacKenzie *et al.*, 2005; Wörgötter, 2011). In line with Rossiter's (2002) C-OAR-SE procedure, rater identification for this study takes the form of individual rater, which in this case is the individual farmer under the NRP and AASL schemes. The component constructs of the AEDM are measured by the indicators within each construct, constituting a measurement model of each, as depicted in Figure 3.15. The structural models for this study are represented by the relationships from one construct to another construct. The propositions formulated for each construct are transformed into hypotheses for empirical testing. The hypotheses are stated in chapter five.

4.4.1 Measurement model for EP

As alluded to in chapters two and three, EP can be influenced or determined by external- and internal environmental factors, and its intensity can be measured through a set of traditional economic indicators such as firm creation rate, survival rate, the percentage of enterprises taken over, the size of the SMEs, the percentage of SMEs active in the export market, sales growth, return on investment, innovativeness, growth, profit, size, liquidity, success/failure, and market share (Bonnafous-Boucher *et al.*, 2011; De Vries *et al.*, 2013; Lucky, 2011; Man & Chan, 2002; Naldi & Davidsson, 2013; Rauch *et al.*, 2009; Powell & Eddleston, 2013). New perspectives offer social capital and financial capital as determinants of EP (Bastié *et al.*, 2013:865-867). This study focuses on external environmental factors influencing EP.

For the purposes of this study, the context of which is agricultural entrepreneurship, EP is measured by growth in agricultural business, competitiveness, and agricultural start-ups. Growth is represented by the increase and expansion of agricultural businesses, whereas success/failure is constituted by the rate of agricultural start-ups or lack thereof. Competitiveness in this context is equivalent to survival ability and market share. Items (questions 68-78) for these three indicators were formulated based on Man and Chan (2013); Murphy *et al.* (1996), and Naldi and Davidsson (2013).

EP (latent construct) is considered a reflective measurement model owing to the fact that the three indicators of growth in agricultural business, competitiveness, and agricultural start-ups are manifestations of it, and causality therefore flows from the latent construct to the indicators. EP is also considered to be a first-order abstract collective object because the item parts are valid representative constituents thereof. Items of the indicators are also considered to be eliciting attributes as they specifically manifest or represent the indicators (Berkout *et al.*, 2014; Coltman *et al.*, 2008; MacKenzie *et al.*, 2005; Rossiter, 2002).

The measurement model for EP is schematically presented in Figure 4.3.

Figure 4.3: Measurement model for EP

EP - Entrepreneurial performance
AB - Growth in agricultural business
CO - Competitiveness
ASU - Agricultural start-ups
ε - Measurement error (reflective)
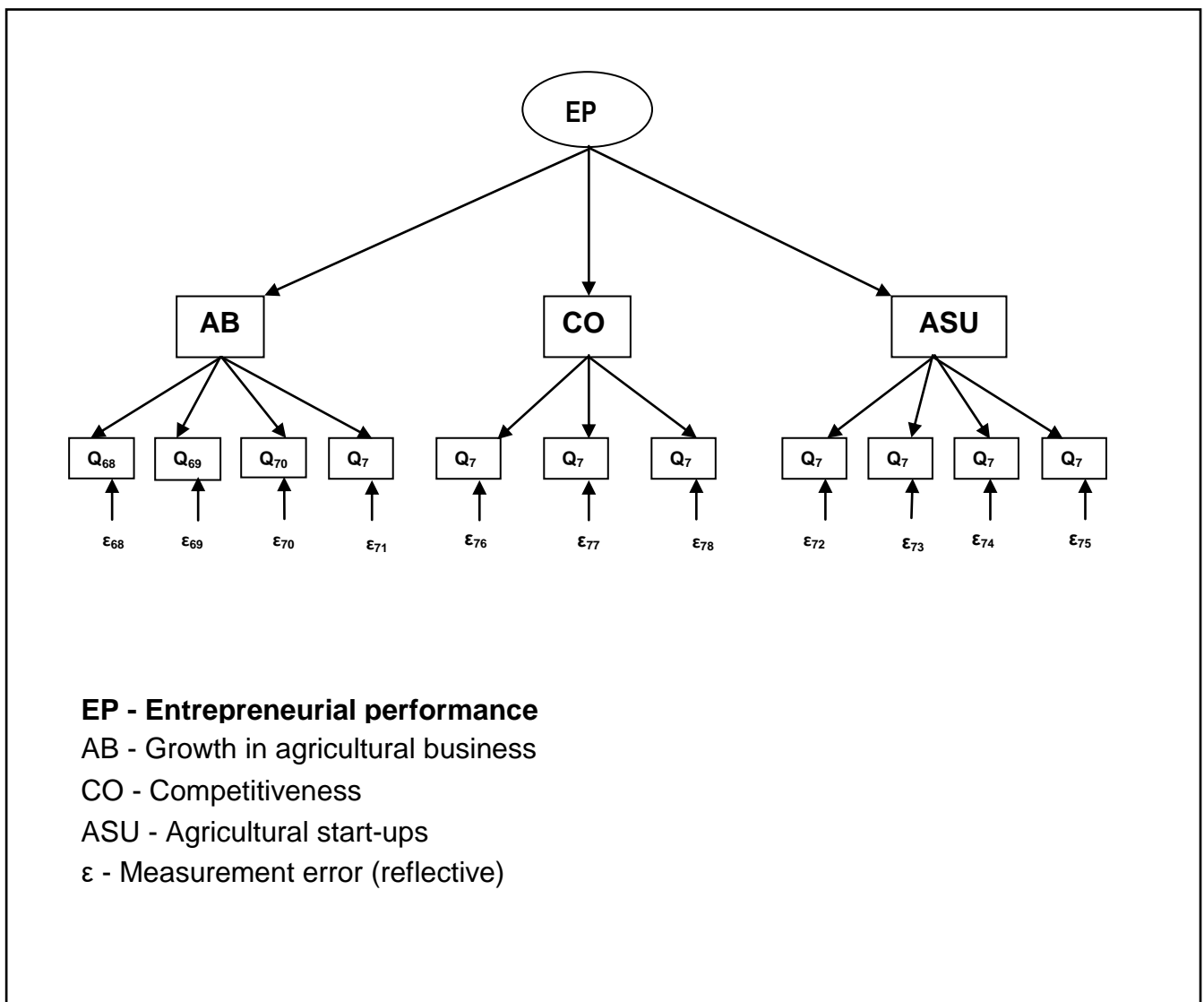
4.4.2 Measurement model for SE

Various scholars and practitioners (Aldrich & Kim, 2007; Carlsson *et al.*, 2013; Gnyawali & Fogel, 1994; Kiggundu, 2002; Klyver *et al.*, 2008:3; Lim *et al.*, 2010) attest to the importance of a supportive environment as a critical element of an environment conducive to the promotion of entrepreneurship in any setting, including the agriculture sector.

For the purposes of this study SE is measured by the: regulatory framework; financial support; non-financial support; social capital (networking); market conditions; culture; role models; education and training, as defined above. Items (questions 1-27) for these eight indicators were formulated based on findings from Antonites (2003), Bosma *et al.* (2012), Busenitz *et al.* (2000), Carlsson *et al.* (2013), Gnyawali and Fogel (1994), He (2009), Kiggundu (2002), Manovola *et al.* (2008), Nieuwenhuizen and Nieman (2014), Klyver *et al.* (2008), and Scherer *et al.* (1989).

SE is considered to be a reflective measurement model given that the eight indicators are its manifestations, and therefore causality flows from SE to the indicators. Furthermore, this latent construct is considered a first-order abstract collective object and the items of its indicators are eliciting attributes as they reflect the indicators.

The measurement model for SE is schematically presented in Figure 4.4.

Figure 4.4: Measurement model for SE

SE – Supportive environment

RM – Role models

NFS – Non-financial support

CU - Culture

SC – Social capital

MC – Market conditions

ε - Measurement error
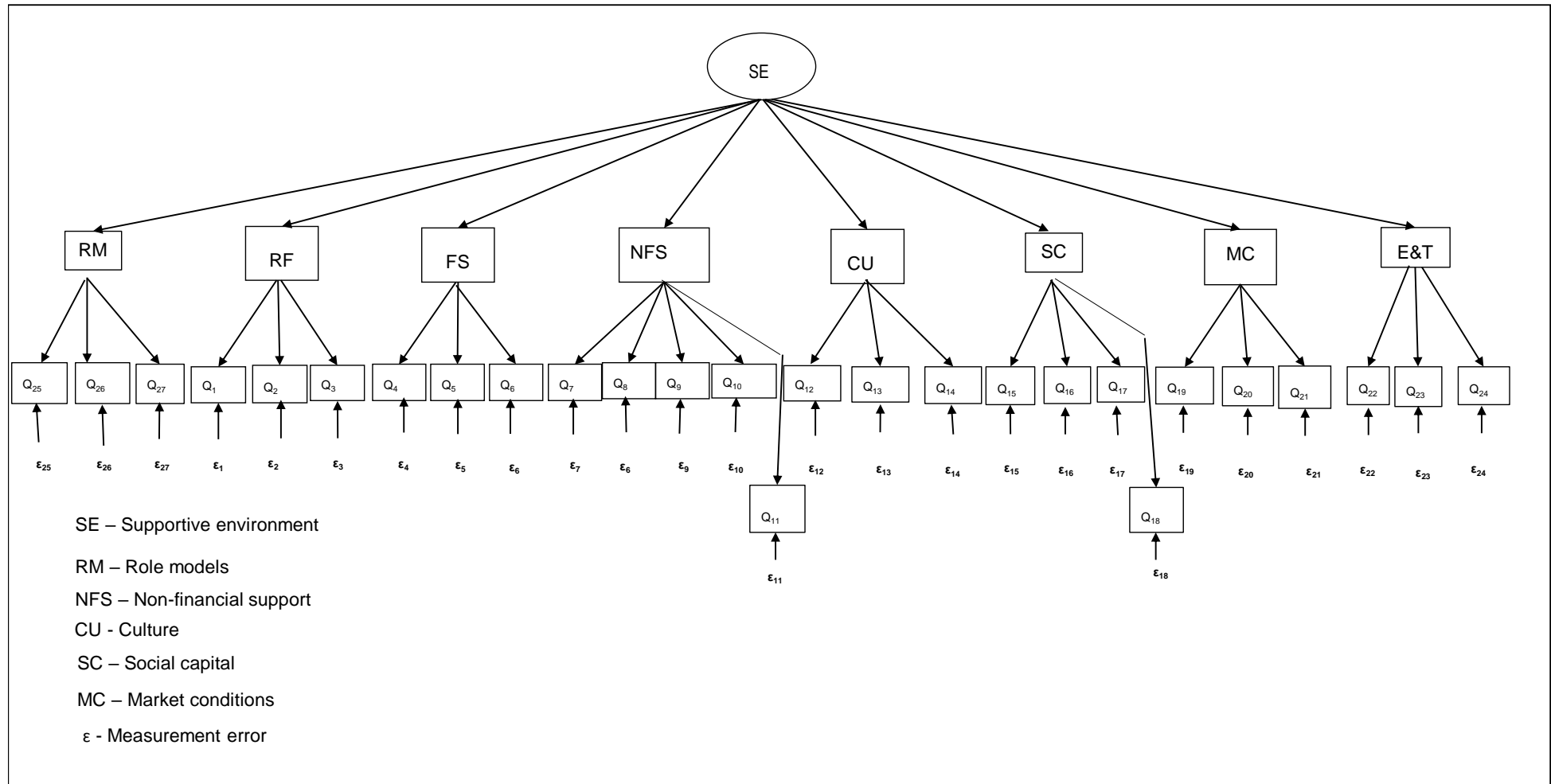
4.4.3 Measurement model for EO

In this study, EO is measured by technology and innovation, risk-taking and pro-activeness. Scholars and researchers on entrepreneurial orientation (Covin & Slevin, 1989; George & Marino, 2011; Lans *et al.*, 2014; Le Roux & Bengesi, 2014; Lumpkin & Dess, 1996; Lumpkin & Dess, 2001; Miller, 1983; Miller, 2011; Miller & Friesen, 1982; Suman *et al.*, 2014; Wiklund & Shephers, 2011) consider it central to the development of entrepreneurship, and view the above-mentioned factors as important indicators of EO. Items (questions 28-34) for these four indicators were initially formulated by the aforementioned scholars, including Klein *et al.* (2005); Lumpkin *et al.* (2009); Rauch *et al.* (2009).

EO is considered to be a reflective measurement model whose indicators are its manifestation. Causality flows from this construct to its indicators. It is a first-order abstract collective object with the items of its indicators or dimensions being eliciting attributes.

The measurement model for EO is schematically presented in Figure 4.5

Figure 4.5: Measurement model for EO

EO – Entrepreneurial orientation
T&I – Technology and innovation
P – Pro-activeness   R- Risk-taking
ε - Measurement error (reflective)
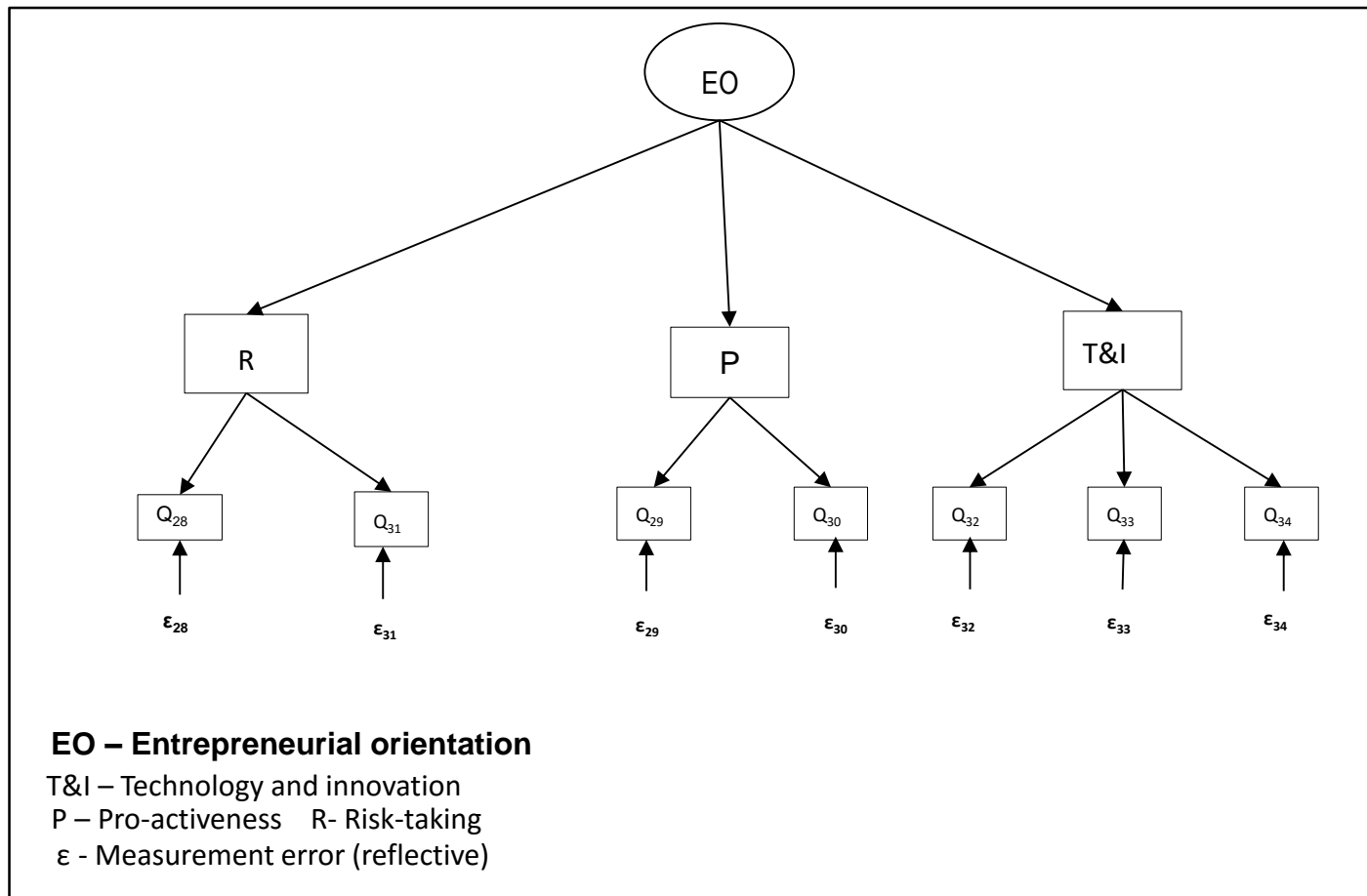
4.4.4 Measurement model for EC

For the purposes of this study, EC are measured by: entrepreneurial skills, business skills, technical skills, performance motivation, and mentorship. As elucidated in chapter three, EC have been shown to be catalyst for entrepreneurial performance by various scholars and researchers (Antonites, 2003; Brush & Changati, 1998; Morris *et al.*, 2012; Robichaud *et al.,* 2001; Sarri, 2010; Shane & Nicolaou, 2014; St-Jean, 2011b; St-Jean & Audet, 2012; Timmons & Spinelli, 2007; Unger *et al.*, 2011). Items (questions 35-56) for the five indicators were formulated based on the findings by the above-mentioned scholars and researchers.

Existing independently of its indicators, EC, are considered to be a reflective measurement model since a change in them, causes a change in their indicators (Coltman *et al.*, 2008:1252). It is a first-order abstract collective object whereby items of its indicators or dimensions are eliciting attributes.

The measurement model for EC is schematically presented in Figure 4.6.

Figure 4.6: Measurement model for EC

EC – Entrepreneurial competencies

ES – Entrepreneurial skills
MO - Mentorship
TS – Technical skills

PM – Performance motivation

BS – Business skills

ε - Measurement error (reflective)
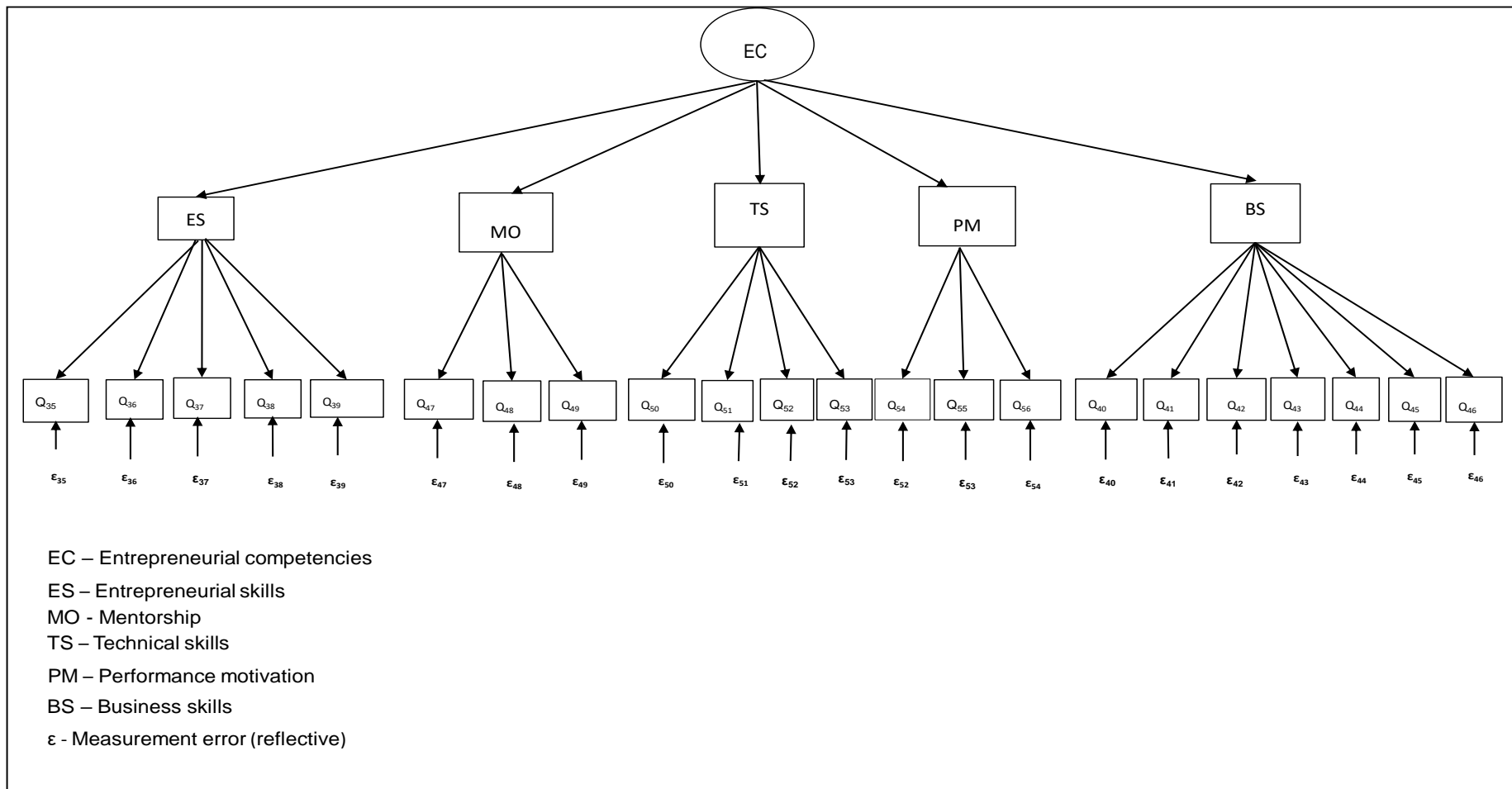
4.4.5 Measurement model for AS

In this study, AS is measured by (i) extension services (ii) climate change, and (iii) the ecosystem, biodiversity and soil erosion. Items (questions 57-67) for these indicators were formulated with ideas initiated by Müller *et al.* (2011), Nkambule and Dlamini (2012), Rigby *et al.* (2001), Pretty (2008), Suman *et al.* (2014), and Wijesooriya *et al.* (2014). Agricultural sustainability is being recognised, all the more as a necessary condition for improved and sustainable food productivity and food security. Various scholars and researchers (Dale *et al.*, 2013; Hall *et al.*, 2010; Müller *et al.*, 2011; Nkambule & Dlamini, 2012; Pretty, 2008; Suman *et al.*, 2014; World Bank, 2011) emphasized the need for the provision of agricultural extension services, climate change adaptation, and the conservation of natural resources through proper management of the ecosystem. Biodiversity and soil erosion and degradation, as a way of enhancing agricultural sustainability, were also considered important.

The latent construct of AS is considered to be a formative measurement model because its indicators make a unique contribution to the construct, and represent defining characteristics that explain the construct. In terms of literature on formative measurement models, a change or omission of one indicator will alter the meaning and substance of the construct (Coltman *et al.*, 2008; Diamantopoulus & Siguaw, 2006; MacKenzie *et al.*, 2005). Causality therefore flows from the indicators to the latent construct. It is a first-order abstract formed object.

The measurement model for AS is schematically presented in Figure 4.7.

Figure 4.7: Measurement model for AS

AS – Agricultural sustainability

XS – Extension services

CC – Climate change

EBS – Ecosystem, biodiversity, soil erosion

ε – Measurement error (reflective)

ζ – Disturbance (formative)
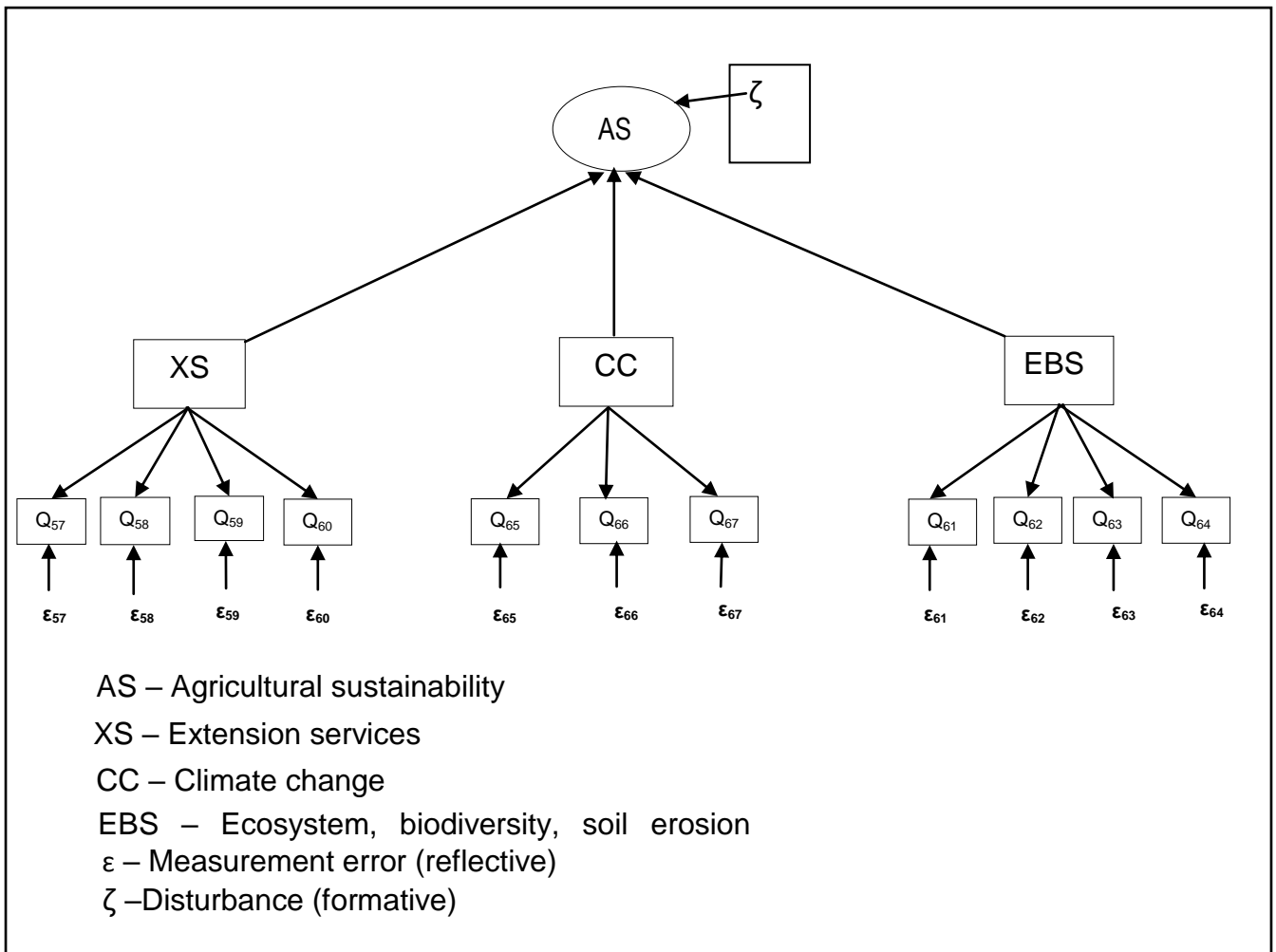
4.4.6 Measurement model for entrepreneurial outcomes

Cumming and Fischer (2013:467) assert that funding entrepreneurial activities that can result in entrepreneurial outcomes such as growth and innovation is more plausible than merely sustaining low-performing SMEs. Thus, publicly-funded business advisory services should be geared towards fostering entrepreneurial outcomes through the enhancement of entrepreneurial performance.

Agricultural productivity, increased incomes, and improved livelihoods are considered entrepreneurial outcomes resulting from entrepreneurial performance in the agricultural sector, in the context of this study. As they represent entrepreneurial outcomes in themselves, they are treated and measured independently of one another.

Agricultural productivity, increased incomes, and improved livelihoods are measured with self-constructed items (questions 79-87). They are tested as part of the structural model measurement because they are outcomes of this study.

The measurement model for entrepreneurial outcomes is schematically presented in Figure 4.8.

Figure 4.8: Measurement model of agricultural productivity, increased incomes, and improved livelihoods
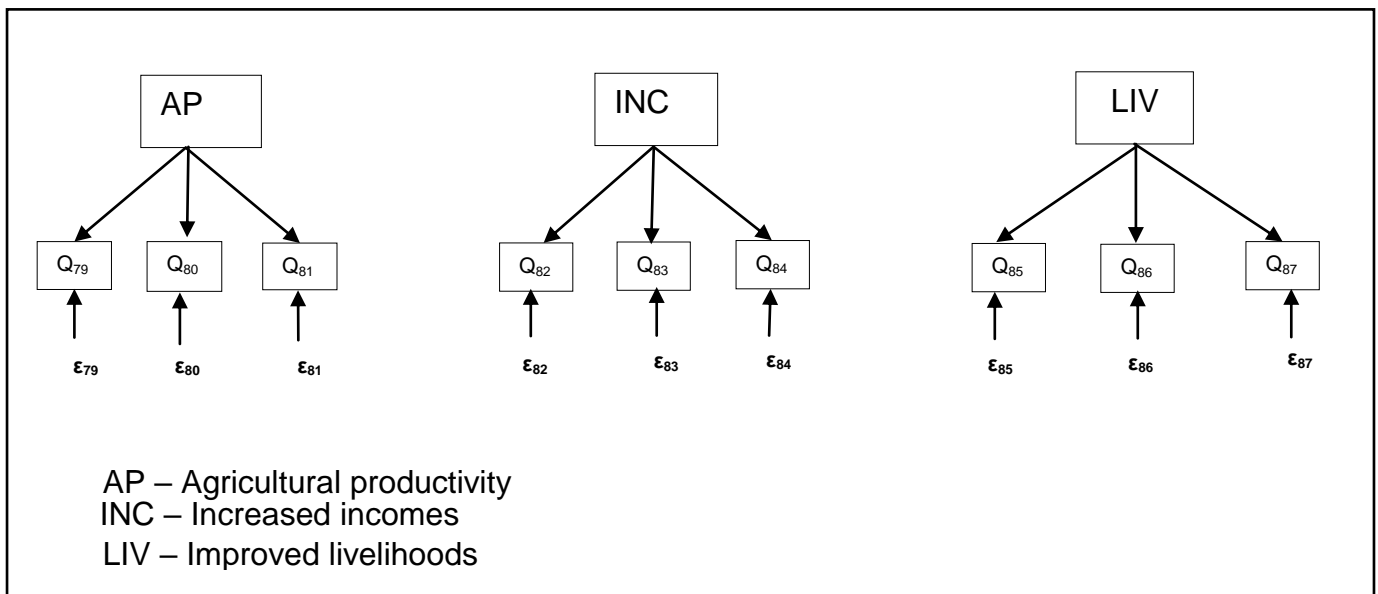
4.4.7 Structural models

There are two types of structural models, namely, the recursive model and the non-recursive model. Recursive latent dependent variables (DVs) display neither feedback loops, nor correlated disturbances (errors) among them. Moreover, their causal effects are uni-directional. Non-recursive latent DVs, however, have feedback loops given that they predict each other, and that correlated disturbances are also prevalent (Kline, 2011; Ullman & Bentler, 2012:666). A recursive model is the preferred model for this study because it is the most straight-forward, its disturbances are uncorrelated, and all causal effects are unidirectional – for instance, no observed variable is represented as both a cause and effect of another variable, be it direct or indirect (Kline, 2011:106). It is not the intention of this study to have such representation on the observed variables.

This study is concerned with direct causal relationships between the exogenous latent constructs and the endogenous latent construct. The exogenous latent constructs as

formulated in the conceptual AEDM are a supportive environment, entrepreneurial orientation, entrepreneurial competencies, and agricultural sustainability. The endogenous latent constructs comprise entrepreneurial performance, and entrepreneurial outcomes as represented by agricultural productivity, increased incomes, and improved livelihoods.

Figure 4.9 depicts the structural model with direct causal effects.

Figure 4.9: Structural model with direct causal effects
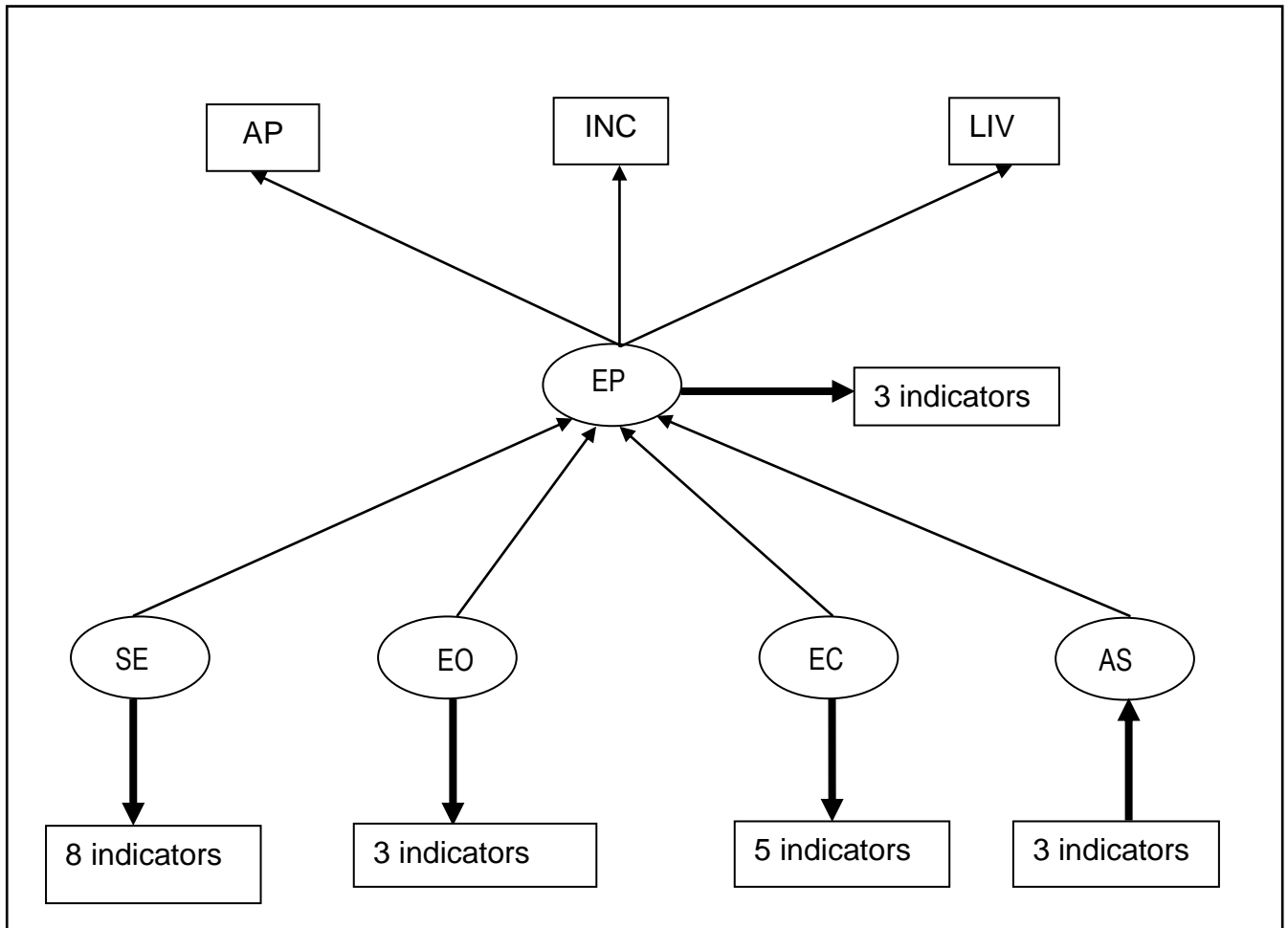
4.5   SUMMARY

This chapter addressed the transformation of the conceptual AEDM into a statistical model for the purpose of empirical testing and validation. The first part reviewed literature related to measurement and measurement instruments with a bearing on the latent constructs constituting the conceptual AEDM.

Subsequently, literature on statistical modelling was reviewed, focusing on SEM as the preferred multivariate statistical technique for the proposed model. The emphasis fell on how SEM comprises both a measurement and a structural models and how a measurement model can further be divided into a reflective- and a formative measurement model. Implications for adopting either were highlighted, particularly in terms of relationships between the latent construct and its indicators and the flow of causality. Exogenous and endogenous constructs were described and the nature of their relationships highlighted.

The two fundamental issues in measurement models, validity and reliability, were also expounded on. Literature review touched on the issue of model mis-specification and the consequences thereof were emphasized. On the structural model, a distinction was made between recursive and non-recursive structural models. This study adopts a recursive structural model.

The final part of this chapter focused on the transformation of the conceptual AEDM into a statistical model by developing measurement models for each of the latent constructs and specifying the recursive structural model with direct causal effect. The hypotheses for the study will be formulated in chapter five.

Chapter five will elaborate on the methodology of this study.

CHAPTER 5
RESEARCH METHODOLOGY

5.1 INTRODUCTION

This chapter outlines the research problem and highlights the objectives guiding it, including, the methodology followed in addressing the research problem identified for this study. Furthermore, the chapter will present the hypotheses for the study, research design, sampling methods, and data collection techniques employed. The validity and reliability of the data collection instrument, data analysis and the statistical technique used will also be discussed. It concludes with a summary of the methodology employed in this study. In order to provide the context and boundaries within which data collection techniques and analysis procedures (research approach) are selected, it is important to define the research philosophy for the study (Saunders & Tosey, 2012:58). This, however, seems to be a neglected issue. A study by Mkansi and Acheampong (2012) indicates that most researchers, and particularly PhD students, are ignorant about research philosophy and rarely comply with it. For the purposes of the present study which adopts a quantitave research approach, the research philosophy of "positivism" seems plausible. Positivism is concerned with a scientific approach to theory testing based on derived hypotheses, and using highly structured data which is usually measurable (Saunders & Tosey, 2012:58). This philosophy suits the research questions of the present study.

5.2 PROBLEM STATEMENT

The research problem for this study is the lack of developmental support models for agricultural entrepreneurship in Namibia in particular, and developing countries in general, as discussed in chapter one. The study therefore aims at developing an AEDM to address this gap. Consequently, the following questions are raised:

- Do the enabling environment dimensions of supportive environment, entrepreneurial orientation, entrepreneurial competencies, and agricultural sustainability impact positively on entrepreneurial performance in agriculture?

- Does entrepreneurial performance result in improved livelihoods, increased incomes and agricultural productivity?

- Does the agricultural-entrepreneurial model provide a useful basis for addressing the gap in theory and practice, as identified?

Moreover, this study investigates direct causal relationships between the constructs of the model.

5.3   RESEARCH OBJECTIVES

As elucidated in chapter one, the primary objective of the study was to develop a developmental model for agricultural entrepreneurship. Such a model would have as its purpose the enhancing and developing entrepreneurial performance in the agricultural sector.

The following secondary objectives are addressed in the present study. These are:

- To develop a model that outlines a targeted support programme aimed at enhancing entrepreneurship and entrepreneurial performance in agriculture, clearly.

- To assess international best practice models as their contribution to the development of the model.

- To add to the existing body of knowledge in academia with respect to mainstream entrepreneurship, with a focus on agricultural entrepreneurs.

- To enlighten policy makers about the potential critical role of entrepreneurship in agriculture; thereby ensuring the formulation of agriculture-and land reform policies for improved productivity in agriculture and enhancing livelihoods of farmers.

- To create a developmental model that can be replicated in other countries in the Southern Africa region with similar socio-economic conditions and agricultural obstacles.

5.4   HYPOTHESES

The hypotheses for this study are stated below, and are derived from the propositions in chapter three, including additional ones arising from the re-operationalisation of the supportive environment latent construct (SE) into two components, namely the supportive environment (SE) and cooperative environment (CE). The re-operationalization was necessitated by the need to ensure better item loadings on the indicators, and better indicator contribution to respective constructs (Schumacker & Lomax, 2010:205). The re-operationalisation of constructs is covered in chapter six.

Some authors (Gnyawali & Fogel, 1994:45; Nieuwenhuizen & Nieman, 2014:12-13) categorise supportive environment as comprising legal regulations and rules, counselling and mentorship, and laws on property rights and bankruptcy. Cooperative environment is constituted by factors such as universities' and high schools' curricula on entrepreneurship, entrepreneurial networks, financial services, business education, public attitude toward entrepreneurs, and government procurement programmes for small businesses. In this study, the revised indicators for SE and CE draw from this categorisation.

The following hypotheses are formulated for the structural model with direct causal effect as depicted in Figure 5.1:

$H_0 1$: SE does not influence EP directly and positively.

$H_a 1$: SE directly and positively influences EP.

$H_0 2$: CE does not directly and positively influence EP

$H_a 2$: CE directly and positively influences EP

$H_0 3$: EO does not directly and positively influence EP.

$H_a 3$: EO directly and positively influences EP.

$H_0 4$: EC do not directly and positively influence EP.

$H_a 4$: EC directly and positively influence EP.

$H_0 5$: AS does not directly and positively influence EP.

H_a5: AS directly and positively influences EP.

H_06: EP does not directly and positively influence agricultural productivity.

H_a6: EP directly and positively influences agricultural productivity.

H_07: EP does not directly and positively influence increased incomes.

H_a7: EP directly and positively influences increased incomes.

H_08: EP does not directly and positively influence improved livelihoods.

H_a8: EP directly and positively influences improved livelihoods.

Figure 5.1: Revised structural model with direct effects
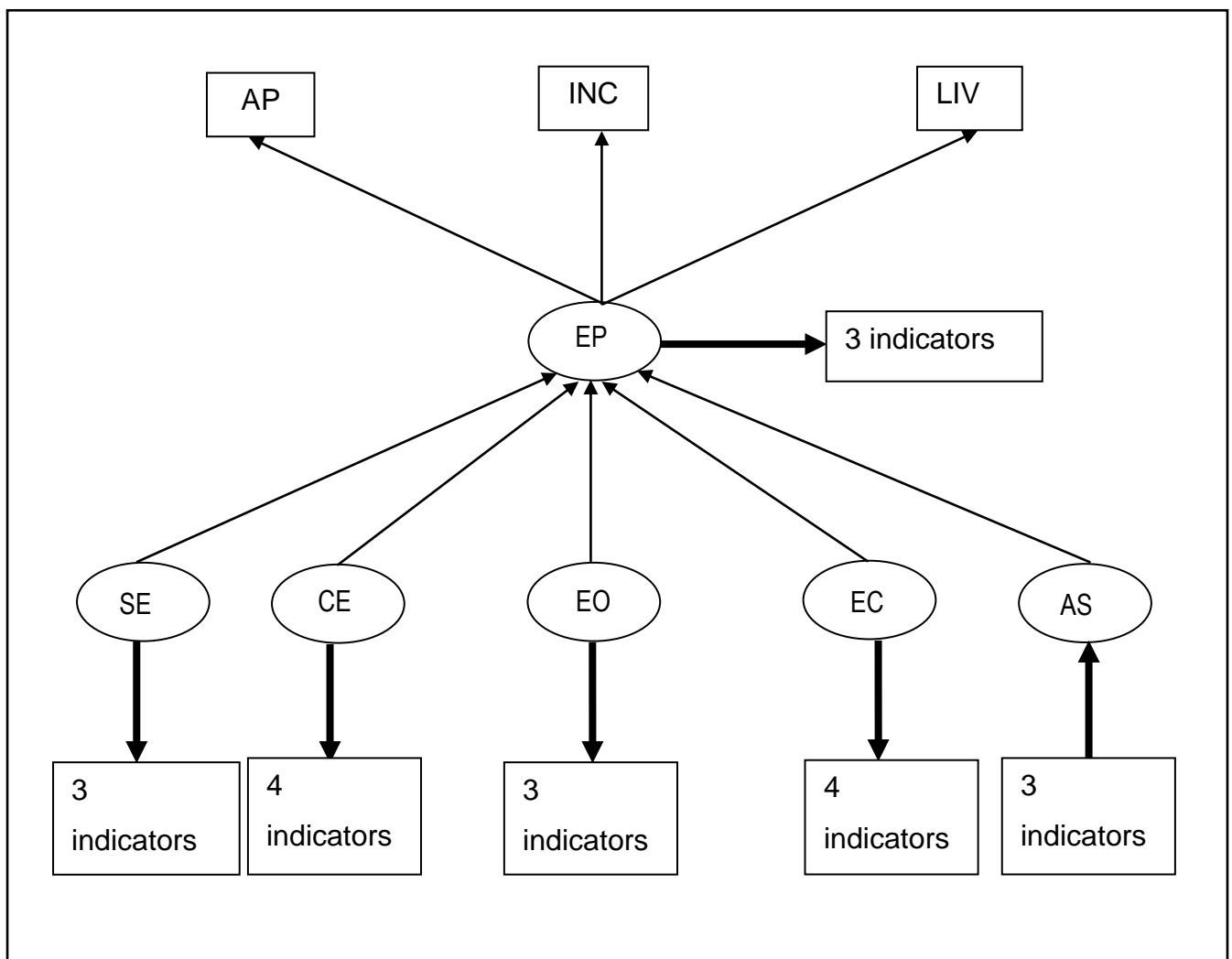
5.5 RESEARCH DESIGN AND METHODOLOGY

5.5.1 Research design

This is a formal study grounded in quantitative research, employing a survey strategy to gather quantitative data. A formal study begins with a hypothesis or research question, and its goal is to test the hypothesis or answer the research question as posed (Cooper & Schindler, 2008:143).

The study adopted SEM as the statistical technique for data analysis. SEM is distinguishable from the other multivariate techniques in that it can estimate interdependent multiple regression equations simultaneously, by specifying the structural model used by the statistical programme (Hair *et al.*, 2006:711). A distinct advantage is its ability to test construct-level hypotheses at a construct level. Furthermore, it tests both direct and indirect effects between constructs (Ullman & Bentler, 2012:663, 673). As stated in chapter four, the current study tested merely direct effects.

Considering that constructs cannot be observed directly, a distinction needs to be made in advance between exogenous and endogenous constructs (Chathoth, 2001:55). A definitional distinction was drawn in chapter four, but here it is worth mentioning that the path is conventionally from an exogenous construct to an endogenous construct or from one endogenous construct to another endogenous construct (Bordens & Abbott, 2011:493; Hair *et al.*, 2006:713).

Unlike a path analysis where path coefficients are derived by using multiple regression analysis, SEM uses specialised statistical techniques such as LISREL (linear structural relations) to derive coefficients (Bordens & Abbott, 2011:495). The SEM consists of two parts, namely the measurement model and the structural model. The measurement model specifies the relationship between constructs and indicators (Diamantopoulus, Riefler & Roth, 2008:1204), whereas the structural model refers to the hypothesized relationships among the constructs (Ullman & Bentler, 2012:662).

The present study is cross-sectional, in that, unlike longitudinal studies which are repeated over an extended period, it was carried out once and represents a snapshot of a point in time. Although a longitudinal study has the advantage of tracking changes over time, its feasibility is contingent on availability of funds and time (Cooper & Schindler, 2008:144). In

the context of the present study, the above-mentioned two factors played a major role in the choice of a cross-sectional study as opposed to a longitudinal one. The study's timeline for finalisation and submission and the funds that would be required to conduct the survey over a longer period weighed heavily in favour of a cross-sectional study. The empirical part of the study was carried out between May 2015 and June 2015 in Namibia. The study was carried out under actual environmental (field) conditions and not under laboratory conditions.

In this study, PLS, specifically PLS-SEM, was employed as it is ideal for exploratory analysis (a prerequisite for theory building), theory building, and theory testing. Moreover, it covers models with both formative and reflective latent constructs (Anderson & Gerbing, 1988:412; Fornell, 1983:445; Hair *et al.*, 2012:312; Lowry & Gaskin, 2014:130-133,141).

5.5.2 Sampling

A population may be defined as the total collection of elements from which statistical inferences can be made (Cooper & Schindler, 2008:374). A sample frame is the list from which a sample is drawn, the latter being defined as a subset of a population. The sample should be chosen carefully so that it represents all characteristics of the population, as if the population itself were examined (Cooper & Schindler, 2008:374,383; Leedy & Ormord, 2005:199; Tustin *et al.*, 2005:337). Sampling is necessitated by some constraining factors such as cost, time and accessibility of population elements (Cooper & Schindler, 2008:375). It may be very costly and time-consuming to survey the whole population of interest, depending on the geographical vastness of the area in which the population of interest resides.

In this study, the target population from which a sample frame and ultimately a sample were drawn are farmers benefiting from both the AALS and NRP programmes. A sample frame for this target population was drawn from the records of the Ministry of Lands and Resettlement for NRP farmers, and from the records of Agribank for AALS farmers. As stated earlier, these two categories of farmers are the focus of this study because they are targeted by the land reform programme. The qualifying criteria used for inclusion in both the NRP and AALS programmes include the following: an applicant must: (i) be a Namibian citizen, (ii) be at least eighteen (18) years of age, (iii) have no more than 150

large stock or 800 small stock, and (iv) not own any land, other than for residential purposes. Additionally, preference is given to applicants with background in agriculture (farming or education), women applicants, applicants who are generational farm workers (those who and whose parents have worked on farms for years), applicants from communal farming areas, and applicants with basic reading and writing skills (Ministry of Lands and Resettlement, 1998).

The government of Namibia, through its Land Policy (1998), embarked on land re-distribution in order to ensure that citizens have access to land for agricultural productivity. Studies (Ministry of Lands and Resettlement, 2010; Werner & Odendaal, 2010) conducted on land re-distribution found gross underutilisation of the allocated land, mostly among the NRP and AALS farmers, for various reasons such as the lack of infrastructure, financial resources and human skills. The present study's aim is the development of a model that would help address this problem.

In studies where SEM is used, a sample size of 200 is regarded as appropriate (Kline, 2011:12). Leedy and Ormord (2005:207) are of the view that for a population size of around 1,500 units, 20 per cent (i.e. 300) should be sampled, and for a population size of about 5,000 units or more, a sample size of 400 should be adequate. In this study, a total of 847 farmers were identified from the lists provided by the Ministry of Lands and Resettlement, and Agribank, out of which 477 responses were received.

Population sampling comes in two categories, namely, probability sampling and non-probability sampling. In probability sampling, the researcher has the opportunity to determine the representation of each segment of the population in the sample in advance. Each population element will have an equal chance of being selected. In non-probability sampling each member of the population does not have a known chance of being included in the sample (Cooper & Schindler, 2008:379-380; Leedy & Ormord, 2005:199).

This study used non-probability sampling, specifically purposive sampling. Two types of purposive sampling exist. They are judgement sampling and quota sampling. Judgement sampling, which was used in this study, requires that the respondent conforms to some criterion – for instance, that the person concerned should be a NRP/AALS farmer. Judgement sampling is suitable also in exploratory studies (Cooper & Schindler, 2008:397-398). NRP/AALS farmers constitute the sampling frame of the present study, which is exploratory. Random sampling was not feasible in this study owing to the fact that these

farmers are spread all over Namibia and it would have been a strain on the limited human and financial resources available for the study. Therefore, judgement sampling was adopted whereby the researcher evaluates whether or not the set of respondents represents the entire population. Considering that most cattle farming, which is the focus of this study, happens in the Khomas, Hardap and Omaheke regions, with the latter generally considered the "cattle country" of Namibia, the sampling frame chosen was considered representative of the population. The land reform programme in the study's geographical scope targets those farmers who have no access to commercial farmland in order to fulfil the objective of equitable land redistribution for agricultural productivity, livelihoods improvement and economic development. Farmers meeting the above qualifying criteria are beneficiaries of the NRP and AALS, and are classified as such.

In the context of this study, the sample frame for the target population (NRP and AALS farmers) was made accessible to the researcher by the Ministry of Lands and Resettlement, and Agribank from their respective records, therefore minimising the possibilities for bias. In order to ensure a sizeable sample, an effort was made to access as many farmers as was practically possible from the lists provided. This entailed using the lists provided by both the Ministry of Lands and Resettlement, and Agribank to contact potential respondents telephonically. In some instances, they were personally visited at their homes and places of work.

Given the vast geographical scope of the area in which the target population resides, the density of the population across the regions, and the cost- and time implications, the study focused mainly on three geographical areas or regions (Omaheke, Hardap and Khomas) because of their proximity to the administrative centre of the survey, Windhoek, the capital city of Namibia. Other, however, regions were represented to a lesser extent because some of the farmers from such regions live and work in Windhoek, and it was therefore easy to administer the questionnaire to them.

The selection of respondents was based on the lists provided by the Ministry of Lands and Resettlement for NRP farmers, and Agribank for AALS farmers. With regard to NRP farmers, the criterion used for selecting respondents was the population density of a particular farm. The most populated farms were targeted for reasons of cost effectiveness and time considerations. The office of the Ministry of Lands and Resettlement in that particular region where those farms are situated provided guidance on how to reach the

farms. Farmers were informed about the survey and asked to cooperate with the completion of the questionnaire.

Respondents benefiting from the AALS scheme were contacted mostly by telephone based on the list provided by Agribank. Those who indicated a willingness to participate in the survey were visited in person, either at their respective farms, or at their offices and homes in their respective places of residence. Questionnaires were delivered for immediate completion or for collection at a later date. Many farmers in this category who agreed to participate in the survey live and work in Windhoek, and were therefore easy to access.

5.5.3 Data collection

The following paragraphs describe the instrument used in collecting data for this study, and the procedure for scale development.

5.5.3.1 Data collection instrument and its measurement

DeVellis (2003:8) defines a measurement scale as a collection of items which are combined into a composite score, and used to measure the levels of latent or unobservable variables. A questionnaire was the research instrument used to gather empirical data. A questionnaire can either be structured or unstructured. A structured questionnaire contains closed questions whereas an unstructured questionnaire has open-ended questions (Cooper & Schindler, 2008:336). For the purposes of this study a structured questionnaire was used as data gathering instrument. The questionnaire is based on the research problem for this study, and is derived from the proposed AEDM. The latter, and specifically its constructs and their attendant indicators, are outlined in chapter four (Figure 4.9). In this study, construct operationalization was informed by the primary research objective which aims at developing a developmental model of agricultural entrepreneurship that would enhance entrepreneurial performance in the agriculture sector. Consequently, measurement was aimed at the exogenous and endogenous latent constructs constituting the AEDM. Therefore, the items or questions were formulated to

capture the views of respondents (farmers) about the potential usefulness of the AEDM. DeVellis (2003:16) provides a typical example of questions formulated to capture the views of parents' aspirations for their children's achievement in the same vein as questions in the present study do for farmers.

Due protocol was followed to obtain the necessary authorisation for data collection. In this respect, permission was obtained to access databases of the Ministry of Lands and Resettlement in the case of NRP farmers, and Agribank for AALS farmers. This facilitated the granting of ethical clearance by the University of Pretoria for data collection. The questionnaire was administered on the selected sample by physical distribution between May 2015 and June 2015 in Namibia. In the case of NRP farmers, who may not be able to complete a questionnaire on their own given their illiteracy, a trained enumerator assisted them.

The chosen data collection instrument should measure the latent constructs of the AEDM. Measurement involves the assignment of numbers to empirical events, objects or properties, or activities in terms of a set of fixed rules (Cooper & Schindler, 2008:279; Welman *et al.*, 2012:136). The questionnaire included items measuring the constructs of the model on a Likert scale. Kislenko and Grevholm (2014:[2]) report that a Likert scale (Likert, 1932) is popular when measuring people's attitudes, perceptions, images, opinions and conceptions. In the context of this study, it is used to measure the latent constructs (the underlying constructs) through their respective indicators as conceptualised in the proposed AEDM.

Clason and Dormody (1994:31) highlight that Likert (1932) proposed a summated scale (which represents the summing of individual item scores) for the assessment of survey respondents' attitudes. The authors, however, inform that the use of individual, and not summated, Likert-type items or questions as measurement tools, are common in agricultural education research.

The traditional Likert scale contains five options ranging from "strongly disagree" to "strongly agree", with a mid-point "neither agree nor disagree", from which participants choose one. This is essentially a Likert item. Likert scales also use seven and nine scale points, technically known as a Likert-type scale since its construction is less rigorous. Among the advantages of a Likert scale, the five scale point in particular, is its ease of use and speed of construction. Moreover, it can be employed with the use of IBM SPSS

programmes (Cooper & Schindler, 2008:309; Dawis, 1987:484; Preston & Colman, 2000: 10, 13).

Preston and Colman (2000:13) caution that the choice of a rating scale (five-point scale, seven-point scale, two-point scale) may be subject to circumstances such as time pressure which would require respondents to opt for quick and easy-to-use rating scales. Therefore, the need for a trade-off between validity, reliability, discriminating power, and respondent preferences arises.

A five-point Likert scale was employed to measure the constructs in the proposed model. This was done by asking respondents to score items on a scale of 1 to 5 in each indicator, with 1 denoting a very negative perception or opinion, and 5 denoting a very positive perception or opinion. The items represented questions posed to establish whether indicators capture the essence of the construct to which they are attached.

Richards and Bulkley (2007:3) argue that there has been relatively minimal scholarly research on agricultural entrepreneurs, given that entrepreneurial research and education has traditionally been a product of graduate business schools, with most of the practising entrepreneurs interviewed, hailing from the non-agricultural business community. As a result, not much literature pertaining to measurement scales in an agricultural entrepreneurial context exists. Notwithstanding the afore-mentioned, and based on literature search, measurement instruments with a bearing on the constructs of the AEDM were identified. These served as the basis for formulating the items constituting the questionnaire for the present study.

The entrepreneurial performance construct was measured by 11 self-constructed questions covering growth in the agricultural business concerned, agricultural start-ups, and competitiveness. Murphy *et al.*'s (1996) items measuring performance in entrepreneurship cover the aspect of growth, which in the context of this study translates into growth in one's own agricultural business and agricultural start-ups. Man and Chan (2002) view competitiveness from the perspective of long-term survivability, taking into account efficiency (market share) and profitability.

A total of nine self-constructed questions measured the construct of entrepreneurial outcomes, which focuses on indicators such as agricultural productivity, increased incomes, and improved livelihoods. Items measuring this construct derive from Yusuf's

(2010) measures of entrepreneurial outcomes such as growth, standard of living and income generation. In this view, and in the context of this study, growth may be equated to agricultural productivity, standards of living to improved livelihoods, and income generation to increased incomes.

For the construct of supportive environment, 27 self-constructed questions covered the indicators measuring this construct. The indicators include, inter alia, regulatory framework, financial support, non-financial support, social capital, market conditions, culture, role models, and education and training. Upon reflection, this construct was re-operationalised into two components, namely, supportive environment (SE) and cooperative environment (CE) to ensure both improved item loadings on the indicators, and indicator contribution to their respective constructs (Schumacker & Lomax, 2010:205). Manolova *et al.*'s (2008) measurement instrument designed to measure a country's institutional profiles for the promotion of entrepreneurship was relied upon in the construction of items for the construct of supportive environment. Their instrument captures dimensions of a regulatory, cognitive and normative nature which have items relevant to these constructs in this study.

A total of seven self-constructed questions measured the construct of entrepreneurial orientation using the indicators of technology and innovation, risk-taking, and pro-activeness. Covin and Slevin's (1989) and Miller and Friesen's (1982) measurement instruments contained items that measured pro-activeness, risk-taking and innovativeness or product innovation. In the context of this study, the focus of which is agricultural entrepreneurial development, items from these scales were not replicated directly. However, general underlying principles were used to construct items that correlate with the context of this study.

The construct of entrepreneurial competencies was measured by 22 self-constructed questions covering the indicators of entrepreneurial skills, business skills, technical skills, performance motivation, and mentorship. Mentorship happens when a novice entrepreneur is paired up with an experienced entrepreneur who provides counselling in terms of strategic thinking and decision-making to avoid the mentee making costly mistakes (St-Jean & Audet, 2012:122). Robichaud *et al.*'s (2001) measurement instrument on entrepreneurs' perceptions of their entrepreneurial goals provided a basis for the formulation of the items pertaining to the performance motivation indicator. Items

pertaining to entrepreneurial skills, business skills, technical skills and mentorship were formulated based on the findings presented by Antonites (2003), Brush and Changati (1998), Chang (2009), St-Jean (2011a), St-Jean and Audet (2012), and Unger *et al.* (2011).

Eleven self-constructed questions covered the construct of agricultural sustainability, and measured extension services, climate change that is change in weather patterns which causes floods and droughts, and ecosystem, biodiversity and soil erosion such as the preservation of natural resources including plants and animals, and the proper management of the land in order to ensure sustainable agriculture. Rigby *et al.* (2001) and Wijesooriya *et al.* (2014) developed measurement instruments for sustainable agricultural management. In the context of this study, items were formulated, derived or adapted from some of the measures and ideas in these measurement instruments, particularly Rigby *et al.*'s (2001:468).

The constructs of stakeholders (item 88) and, monitoring and evaluation (item 89-90), were included for exploratory research purposes and did not form part of inferential statistical testing.

Demographic data relating to gender, academic qualification, previous experience prior to farming, region of farming, government schemes, main farming activity, farming legal business form, and turnover/annual sales, were collected by items measured on nominal scales. Demographic data about age and number of permanent employees in the farming operation, however, were measured by open-ended questions yielding ratio data.

The questionnaire developed for this study comprised 100 items, and is reported on in Appendix A.

5.5.3.2 *Validity of the data collection instrument*

The data collection instrument (questionnaire) should be valid. It should be able to measure what it is purported to measure for validity (internal validity) to hold and for the questionnaire to be useful. Various forms of internal validity can be distinguished. These include content validity, construct validity, and criterion-related validity (Bordens & Abbott, 2011:276-277; Cooper & Schindler, 2008:290-291). This study considered content validity

and construct validity because they are regarded as being more relevant when validating the measurement instrument for this study.

5.5.3.2.1 Content validity

Content validity, in simple terms, means that the data collection instrument should be composed of items that collect information accurately and comprehensively, enabling the users to address the research question or problem statement appropriately. According to Cooper and Schindler (2008:290) content validity is about the extent to which the measurement instrument covers the research questions adequately.

In the context of this study, content validity is realised when the items in the questionnaire cover the constructs in the AEDM comprehensively. The constructs are supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies, agricultural sustainability, entrepreneurial performance, and entrepreneurial outcomes. The questionnaire was pre-tested on four NRP/AALS farmers. The choice of the pilot sample size was based on feasibility reasons, including the limited time for data collection and the cost that would have resulted from a much bigger pilot sample. The chosen pilot respondents were considered to have the necessary capacity to deliver an objective view on the reliability and validity of the questionnaire. The pilot respondents were observed for the time taken to complete the questionnaire, their understanding and the relevance of the content to the constructs of the model. They perceived that the questionnaire items covered the study's research questions. It is not uncommon to use a small pilot sample to pre-test the reliability and validity of a questionnaire. For instance, Kantur (2016:32) used a pilot sample of three interviewees to comment on a proposed scale to measure strategic entrepreneurship.

5.5.3.2.2 Construct validity

According to Bordens and Abbott (2011:276) the construct validity of the questionnaire can be verified when the results of the questionnaire confirm the theory or advanced

hypotheses. The empirical results obtained through the questionnaire should agree with the operational definition of the construct under investigation.

Consequently, great care should be taken when formulating a clear operational definition of the construct or unit of analysis. The research questions should relate to the construct, whereas the objectives of the study should relate to the research questions. These will serve as guidelines for formulating a questionnaire that collects information relevant to answering the research questions. As regards this study, the questionnaire's construct validity was verified by way of pre-testing in the same way as was done for content validity. The pilot respondents perceived that the questionnaire measured the constructs covered by the study.

5.5.3.3 Reliability of the data collection instrument

Reliability is concerned with estimates of the degree to which a measurement is free of random or unstable error. It also provides consistent results on repeated administrations. Whilst it is a necessary contributor to validity, reliability is by no means a sufficient condition for it. For instance, a measurement instrument that yields consistent results and is free of random error, but does not measure what it is purported to measure; it is therefore not robust (Cooper & Schindler, 2008:292-293).

5.5.3.3.1 Internal consistency

A measurement scale is a collection of items that form a composite score to measure phenomena that theory purports to exist but that cannot be assessed directly. These phenomena are called latent variables or constructs. Internal consistency reliability is about the homogeneity of the items forming the scale. Internal consistency comes about when the scale's items are highly intercorrelated (DeVellis, 2010:9, 27). There are a number of tests that can be used to measure internal consistency, and Cronbach's alpha coefficient of reliability is one of them. However, the choice of the test used to measure internal consistency depends on the SEM technique which is chosen. In the present study,

the choice of the SEM technique and the attendant reliability and validity tests are addressed in section 5.5.4.3.

5.5.3.4 Practicality of the data collection instrument

The design of the questionnaire should consider the challenges posed by the environment in which it is to be administered. It has to be as practical as possible. Cooper and Schindler (2008:295) define practicality from the perspective of economy, convenience and interpretability.

From an economic perspective, the questionnaire should not be too elaborate thereby avoiding a vast capital outlay for printing and transportation. DeVellis (2003:12), nevertheless, cautions against constructing one that is too brief to be reliable. This also holds good for the method of its administration. Face-to-face interviews are more costly to conduct than telephonic interviews. It would, therefore, be advisable to choose the most cost-effective way of data collection, unless the situation requires a personal interaction between enumerator or data collector and respondents.

The data collection phase of this study entailed the administration of questionnaires to sample respondents, with the collaboration of enumerators. Owing to the high illiteracy rate among the farmers, particularly the NRP farmers, enumerators proved necessary to assist respondents should they have required assistance understanding the content of the questionnaire.

The convenience of the measurement instrument has to do with the simplicity and ease of its application. A questionnaire with clear instructions and examples on how to complete it is easier to administer (Cooper & Schindler, 2008:295). Against this background, the questionnaire for the current study was formulated in clear and simple language, avoiding jargon for the greater part. A deliberate attempt was made to clarify concepts and constructs as much as practically possible. Much attention was devoted to recruiting an experienced enumerator who familiarized himself with the questionnaire prior to engaging with the respondents.

5.5.4   Data analysis

The primary purpose of statistical techniques is to estimate the probability emerging from the pattern of data collected, as it could have occurred by chance rather than by the causes proposed by the theory being tested (Lowry & Gaskin, 2014:123). As stated in chapter four, SEM is the statistical technique adopted for modelling in this study.

It was asserted that SEM offers distinct advantages over first-generation statistical analysis techniques. The latter statistical procedures, for instance, conduct exploratory research by performing analyses such as correlations, regressions, and difference of means tests. SEM is able to estimate a series of separate, yet interdependent, multiple regression equations simultaneously (Hair *et al.*, 2006:711). Another prime advantage of SEM is its ability to include latent constructs in causal models (Lowry & Gaskin, 2014:125).

The following paragraphs discuss the approaches used in SEM. These approaches will be contrasted in terms of advantages and disadvantages, and the rationale for choosing one over the other(s) will be elaborated upon for purposes of this study.

There are basically two forms of SEM, namely covariance-based SEM (CB-SEM) and the partial least square (PLS-SEM) SEM (Lowry & Gaskin, 2014:130). A third approach, generalized structured component analysis (GSCA), however, has emerged. It will be discussed and contrasted with CB-SEM and PLS-SEM below. CB-SEM is implemented through a computer programme known as LISREL, which stands for "linear structural relationships" (Diamantopoulos, 1994:105). PLS-SEM may be implemented through a computer programme known as SmartPLS (Lowry & Gaskin, 2014:132).

Table 5.1 presents a summary of comparisons between CB-SEM and PLS-SEM techniques.

Table 5.1: Summary of contrasts of the CB-SEM and PLS-SEM techniques

CB-SEM	PLS-SEM
• Good for model validation, theory testing and theory building. • Allows for the comparison between observed and proposed covariance matrices which enables assessment of overall model fit. • Unreliable in the exploratory analysis required for theory building.	• Good for preliminary theory building and causal-predictive analysis • Does not have the capability for comparison of the observed and proposed covariance matrices. • Reliable for exploratory analysis which is required for theory building. • Can be used for both confirmatory and

CB-SEM	PLS-SEM
• Good for confirmatory analysis. • Ends with factor indeterminacy; meaning it produces more than one mathematically-sound solution despite having no means to link it to the hypothesis being tested. • It assumes the use of reflective indicators rather than formative indicators in a model. • Assumes data normality.	exploratory analysis. • Avoids factor indeterminacy by composing constructs from factor scores and using these in subsequent calculations, yielding explicit factor scores. • It can be used in models with formative (or a mix of reflective and formative) indicators. • It is robust to violations of multivariate normal distributions.

Source: Adapted from Anderson and Gerbing (1988:412); Diamantopoulos (2006:106); Lowry and Gaskin (2014:130-132).

The objective of CB-SEM is to reproduce the theoretical covariance matrix without focusing on explained variance. PLS-SEM, is on the contrary, a causal modelling approach with the objective of maximising the explained variance of the dependent latent constructs (Hair *et al.*, 2011:139).

Table 5.2 provides recommendations on when to use CB-SEM or PLS-SEM. In order to assist decision-making in terms of choosing CB-SEM or PLS-SEM, it is imperative to determine the nature of the research – for instance, whether it is exploratory (building or testing a new theory; causal-predictive analysis) or confirmatory (testing a well-established theory for theory development). As was stated in chapter three, this study builds and tests theory by way of developing and validating the AEDM, and represents exploratory research.

Table 5.2: Recommendations on when to use PLS-SEM versus CB-SEM

Model Requirement	CB-SEM	PLS-SEM
Includes interaction effects	Difficult with small models, nearly impossible with large ones	Preferable, as it is designed for easy interactions
Includes formative factors	Difficult	Easier
Testing alternative models	Preferable, as it provides model fit statistics for comparison	Can be used
Includes more than 40-50 variables	Sometimes unreliable if it does converge; sometimes will not converge	Preferable
No-normal distributions	Should not be used, results in unreliable findings	Preferable (although it will still affect results, just to a lesser extent)

Model Requirement	CB-SEM	PLS-SEM
Non-homogeneity of variance	Should not be used, results in unreliable findings	Preferable (although it will still affect results, just to a lesser extent)
Includes multi-group moderators	Preferable	Can be used, but difficult
Small sample size	Unreliable if it does not converge, often will not converge	It will run (although it will still affect results negatively)

Source: Adapted from Lowry and Gaskin (2014:133).

For exploratory work and causal-predictive analysis, PLS-SEM is preferable, whereas for confirmatory work and theory building either CB-SEM or PLS-SEM may be used (Anderson & Gerbing, 1988:412; Lowry & Gaskin, 2014:132).

5.5.4.1 Contrasting GSCA with CB-SEM and PLS-SEM

GSCA represents a component-based approach to SEM. It thus defines latent variables or constructs as components or weighted composites of observed variables or indicators (Hwang, Malhotra, Kim, Tomiuk & Hong, 2010:700). In contrast to the CB-SEM, which defines latent constructs as being equivalent to common factors, the GSCA defines latent constructs as components or weighted sums of observed indicators, similar to PLS-SEM. This means that latent constructs in the CB-SEM are random whereas they are fixed in both the PLS-SEM and GSCA.

All three approaches specify the measurement- and structural model. However, the CB-SEM and GSCA combine the two sub-models into a unified algebraic formulation or single equation, whilst the PLS-SEM addresses them separately. Under conditions of correct model specification, CB-SEM and GSCA seem to outperform PLS-SEM (Hwang, *et al.*, 2010:701, 708). For the purposes of this study, PLS-SEM is preferable owing to its suitability for exploratory research, theory building, theory testing, and causal-predictive purposes.

However, whichever approach of SEM is applied, the issue of multicollinearity (highly correlated constructs or variables) is very important and needs addressing. Niemelä-

Nyrhinen and Leskinen (2014:3-4) point out that overlooking multicollinearity may lead to fallacious path coefficient estimates or even bring about statistical non-significance of the parameter estimates. The authors propose ridge estimation as one possible means of mitigating the effects of multicollinearity in SEM using the LISREL programme.

In this study, multicollinearity was addressed by obtaining outer variance inflation factor (VIF) and inner VIF values for the formative latent construct AS, as presented in Tables 6.17 and 6.18 in chapter six. Accordingly, all outer VIF values for indicators of the formative construct AS and inner VIF values for all exogenous constructs are lower than 5, which is the norm set for avoiding multicollinearity (Hair *et al.* 2011:145). Therefore, multicollinearity is not a problem in this study.

The problem of non-normality in data, which gives rise to difficulty of knowing the shape of the sampling distribution, may be overcome by applying the concept of bootstrapping. Basically, this means estimating the properties of the sampling distribution from the sampling data (Field, 2012:199).

It was elucidated in chapter four that it is important to distinguish between reflective measures and formative measures in order to ensure proper specification of the measurement model which, in turn, would facilitate the assignment of meaningful relationships in the structural model (Anderson & Gerbing, 1988:411).

CB-SEM assumes the use of reflective indicators in a model. Therefore, exhibits have difficulties with models which include formative indicators or a mix of reflective and formative indicators. The proposed AEDM in this study is conceptualized to include both reflective and formative constructs.

The latent construct of agricultural sustainability has been conceptualized as being formative, whereas the latent constructs of supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies, and entrepreneurial performance are conceptualized as being reflective. Additionally, whilst CB-SEM is appropriate for model validation, theory testing, theory building and confirmatory analysis, it is unreliable in exploratory analysis and causal-predictive analysis.

It was stated by Richards and Bulkley (2007) that there has been relatively minimal scholarly research on agricultural entrepreneurs. Consequently, the field of entrepreneurship's novel approach of focusing on the agriculture sector, results in

insufficient literature on agricultural entrepreneurship. This demonstrates that theory building in agricultural entrepreneurship and entrepreneurial performance is still in its infancy stage. It follows therefore that an appropriate SEM approach should address aspects of theory building, theory testing, exploratory analysis and causal-predictive analysis. PLS-SEM seems well-placed to address these aspects.

For the purposes of this study, the PLS-SEM is the most appropriate approach as it is good for exploratory analysis (a prerequisite for theory building), theory building and theory testing. Furthermore, it allows for causal-predictive analysis (Anderson & Gerbing, 1988:412; Fornell, 1983:445; Hair *et al.*, 2012:312; Lowry & Gaskin, 2014:130-132). PLS-SEM is suitable for models with both formative and reflective latent constructs (Lowry & Gaskin, 2014:133,141,142). The AEDM was formulated utilising agricultural sustainability, one of the formative latent constructs. The remaining latent constructs were reflective. This study used SmartPLS (Ringle, Wende & Becker, 2015) software for the conducting of data analysis.

Based on this study's grounding in exploratory research, its inclusion of causal-predictive relationships, its use of both reflective and formative measures in its model, and its theory-building objective, PLS-SEM was deemed the more appropriate SEM technique.

5.5.4.2 Model specification in PLS-SEM

When specifying models in PLS-SEM, there is a need to ascertain exactly which indicators are reflective and which are formative in order to prevent Type I and Type II errors from occurring. It is importantly so, because the tests used to establish factorial validity for reflective indicators are quite different to the approach used to validate formative indicators (Lowry & Gaskin, 2014:135). In PLS-SEM context, the structural model of SEM is referred to as the inner model, and the measurement models of SEM are called outer models (Hair *et al.*, 2011:141).

Wörgötter (2011:220-222) describes the procedure for model specification in PLS-SEM. Firstly, the measurement model which relates the observed indicators to their latent constructs is estimated. Case values for each latent construct are estimated as a weighted sum of its indicators. The weights are obtained by first determining the measurement model for each latent construct, calculating simple regression models where the

measurement model is reflective, and coefficients where the measurement model is formative. In the case of a formative measurement model, the coefficients link the observed indicators to the latent construct. As for a reflective measurement model, the loadings of the observed indicators in the simple regression model determine the impact on the latent construct.

In terms of the structural part of the PLS-SEM model, estimation takes place through ordinary least squares regressions among latent constructs, and the relationships are used mostly for prediction, rather than for structural explanation as is the case in CB-SEM (Wörgötter, 2011:220).

5.5.4.3 Model fit assessment in PLS-SEM

Wörgötter (2011:222) notes that the PLS-SEM path modelling, unlike CB-SEM path modelling, has no overall fitting function to assess model goodness-of-fit. Each part of the SEM, therefore, needs to be evaluated or assessed separately.

Reflective measurement models or reflective outer models should be assessed with regard to their reliability and validity. In PLS-SEM, construct reliability assessment routinely focuses on composite reliability as an estimate of a construct's internal consistency. Composite reliability is preferred to Cronbach's alpha in PLS-SEM because, in contrast to the latter, it does not assume that all indicators are equally reliable (Hair, Sarstedt, Ringle & Mena, 2012:424; Hair, Sarstedt, Pieper & Ringle, 2012:328). Composite reliability values of 0.60 to 0.70 in exploratory research are considered satisfactory. Each indicator's absolute standardised loading should be higher than 0.70 (Hair *et al.*, 2011:145). However, as theory building in agricultural-entrepreneurial development is in the early stages, this study adopted a minimum of 0.60 as suggested by Wong (2013:21).

Hair *et al.* (2011:146) posit that in terms of validity in PLS-SEM, the focus is on convergent validity and discriminant validity. For convergent validity, the emphasis should be on examining the average variance extracted (AVE), with an AVE value of 0.50 and higher indicating a sufficient degree of convergent validity. This means that the latent construct explains more than half of its indicator's variance.

For discriminant validity, two measures have been put forth – the Fornell-Larcker criterion and cross loadings. According to the Fornell-Larcker criterion, the AVE of each latent construct should be greater than the latent construct's highest squared correlation when compared with any other latent construct (Hair *et al.*, 2011:146). However, whilst AVE is a more conservative measure than composite reliability, the researcher may conclude on the basis of the latter that the convergent validity of the latent construct is sufficient, even though more than 50 per cent of the variance is attributable to error (Fornell & Larcker, 1981:46). In this view, this study may adopt this approach given the infancy of research in agricultural entrepreneurship.

With regard to the cross-loadings criterion, an indicator's loading with its associated latent construct should be higher than its loadings with all the remaining constructs, that is, the cross loadings. The construct should share more variance with its measures or indicators than it does with other constructs in the same model (Hair *et al.*, 2011:146; Hulland, 1999:199). The current study reports the Fornell-Larcker criterion.

Table 5.3 presents the criterion for checking reliability and validity for reflective constructs in PLS-SEM, which serves as a guide for the present study. The results are presented in chapter six.

Table 5.3: Summary of reliability and validity measures for reflective constructs

Reliability	
Indicator reliability (outer loadings[2])	• Outer loadings higher than 0.70, but in cases of exploratory research or early stages of scale development, 0.40 or higher is acceptable.
Internal consistency	• Composite reliability should be 0.7 or higher. It can be 0.6 or higher if it is an exploratory research or in early stages of scale development.
Validity	
Convergent validity	• AVE should be 0.5 or higher • Researcher may conclude on the basis of composite reliability that convergent validity is adequate.
Discriminant validity	• Fornell-Larcker criterion determines that the square root of AVE of each latent construct should be greater than the correlations among the other latent constructs.

Source: Adapted from Fornell and Larcker (1981:46); Hair *et al.* (2011:146); Hulland (1999:199); Wong (2013:21).

In formative measurement models or formative outer models, formative indicators are assumed to be error-free, and therefore the concepts of internal consistency reliability and convergent validity do not apply.

Another important aspect to consider in formative outer models is multicollinearity as its prevalence presents problems in determining the contribution of each indicator to its construct. It is recommended that each indicator's VIF value should be less than 5 (Hair *et al.*, 2011:145; Hair, Sarstedt, Pieper, *et al.*, 2012:329). VIF values greater than 10 are commonly regarded as signifying high multicollinearity (Diamantopoulos *et al.*, 2008:1212). This study adopted the cut-off point of VIF less than 5. The results are presented in chapter six.

Table 5.4 presents the validity measures for formative constructs.

Table 5.4: Validity measures for formative constructs

Construct	Measure
Validity measures	• Multicollinearity: VIF should be less than 5. • Outer weights of the indicators: bootstrapping used to assess significance of the weights.

Source: Hair *et al.* (2011: 145), Hair, Sarstedt, Pieper, *et al.* (2012:329).

The structural model or inner model has as its primary evaluation criteria the coefficient-of-determination (R^2) measures, and the level of significance of the path coefficients. R^2 indicates the amount of explained variance for each endogenous construct (Hair *et al.*, 2011:147; Hair, Sarstedt, Ringle, *et al.*, 2012:426). As PLS-SEM aims to explain the endogenous latent construct's variance, R^2 values should be high, the extent to which depends on the research topic or discipline. Pallant (2011:134) suggest the following ranges: 0.10−0.29; 0.30−0.49; and 0.50−1.00, as small, medium, and large, respectively, for social sciences. This study adopts 0.30−0.49 as the minimum, in view of the infancy of research in agricultural entrepreneurship.

Path coefficient values range between -1 and +1. A value of +1 signifies a positive correlation, meaning that a variation of an independent construct leads to the same variation in the dependent construct. In contrast, a value of -1 means that a positive variation of the exogenous construct results in an identical negative variation of the

respective endogenous construct (Lehner & Haas, 2010:82). The authors consider values higher than 0.40 to be very strong.

Henseler and Chin (2010:83) assert that interaction effects, also called moderating effects, are evoked by variables or constructs, whose variation influences the strength or the direction of a relationship between an independent and dependent variable. Of the four available approaches (product indicator approach, two-stage approach, hybrid approach and orthogonalizing approach) used for assessing interaction effects between latent constructs, the authors recommend the orthogonalizing approach.

This approach delivers the best point accurate estimates for interaction- and single effects. It also has a high prediction accuracy, which correlates with studies using the PLS-SEM path models mainly for prediction purposes (Henseler & Chin, 2010:106). The authors present Cohen's (1988) f^2 effect size measure for hierarchical multiple regression as the most appropriate for assessing the strength of the interaction or moderating effect between the latent constructs of the structural model – for instance, the impact of the exogenous latent construct on the endogenous latent construct. It is represented by the following formula:

$$f^2 = \frac{R^2_{incl} - R^2_{excl}}{1 - R^2_{incl}}$$

where: R^2_{excl} represents the variance accounted for by the independent and the moderator variable, and R^2_{incl} the combined variance accounted for by the independent and the moderator variable and their interaction. Conventionally, f^2 effect sizes of 0.02, 0.15, and 0.35 are regarded as small (weak), medium (moderate), and large (strong), respectively (Hair, Ringle & Sarstedt, 2013:7; Henseler & Chin, 2010:105). This study adopts the above categorisation of f^2.

5.6   SUMMARY

The chapter presented the research methodology for this study. In the first step, the problem statement, research questions and the research objectives were outlined. These

were followed by an elaboration on the hypotheses, derived from the propositions stated for the AEDM in chapter three, and to be tested using path modelling. The research design and sampling method for the study were discussed in detail.

In terms of data collection, this study adopts a survey technique using a structured questionnaire. A five-point Likert response format and Likert-type scales were used in the questionnaire. The questionnaire was pre-tested with pilot respondents in terms of reliability, validity and practicality. This chapter also compared and contrasted the various SEM approaches used in data analysis, specifically the CB-SEM, PLS-SEM and GSCA. The PLS-SEM was the preferred and most appropriate approach for the purposes of this study.

Chapter six will present the empirical results through a detailed and in-depth analysis of the data. It will narrate the findings and their implications for the problem statement, research questions, research objectives, and hypotheses.

CHAPTER 6
DATA ANALYSIS

6.1 INTRODUCTION

This chapter focuses on the analysis and interpretation of the results of the statistical estimation of the model. Firstly, the characteristics of the sample are presented by making use of descriptive statistics, in order to facilitate the interpretation of the findings.

Secondly, the results and outcomes of all the measurement models are discussed. The structural model is then estimated and discussed in relation to the hypotheses stated for this study.

6.2 DESCRIPTIVE STATISTICAL ANALYSIS

Descriptive statistical analysis was performed in order to obtain a profile of the demographical information which was captured on the questionnaire with regard to age, gender, academic qualification, work experience immediately before farming, area/region of farming, type of government support scheme, type of farming activity, legal business form of farming, turnover of farming, and number of employees.

Table 6.1 presents the age range of respondents. The majority (77.5 per cent) of those involved in farming were in their middle to senior age group (40 to 60 age range). The age range 18 to 28 was quite negligible at 0.8 per cent. Similarly, the age group 29 to 39 was a mere 4.4 per cent. These results support the general characteristic of the Namibian farming sector with the youth typically being less active in the agricultural sector, and with the majority of farmers being older than 40 years. Kew, Namatovu, Aderinto and Chigunta (2015:42) report that less than 10 per cent of young people in Namibia are involved in agriculture. This may be attributable to the lack of policies that would encourage young people to get involved in agriculture, and also policies that would enhance global competitiveness of the agriculture sector (Kew *et al.*, 2015:43).

Table 6.1: Age range of respondents

Age	Frequency (n)	Percentage (%)
18 – 28	4	0.8
29 – 39	22	4.4
40 – 50	149	31.3
51 – 60	218	46.2
61 – 70	65	13.5
71 – 82	19	3.8
Total	**477**	**100.0**

With regard to gender, male respondents made up most of the sample. As Table 6.2 demonstrates, 75.8 per cent of respondents were male and 24.2% were female. These frequencies reflect the overall composition of the farmer population in Namibia, as in 2014 the majority of subsistence farmers were male at 62.7 per cent compared to female farmers at 37.3 per cent (Namibia Statistics Agency, 2014:57).

Table 6.2: Gender of respondents

Gender	Frequency (n)	Percentage (%)
Male	360	75.8
Female	115	24.2
Missing	2	0.0
Total	**477**	**100.0**

Table 6.3 presents the highest formal qualification of respondents. The majority of respondents (51.3 per cent) had no qualification. This was followed (20.0 per cent) by those who had tertiary education at the level of certificate and diploma. Only 11.1 per cent of respondents had tertiary qualification at degree level, and 8.0 per cent and 9.0 per cent had completed primary and high school, respectively.

Table 6.3: Qualifications of respondents

Qualifications	Frequency (n)	Percentage (%)
No qualification	244	51.3
Primary school completed	38	8.0
High school completed	43	9.0
Tertiary qualification (certificate, diploma)	95	20.0
Tertiary qualification (degree)	53	11.1
Other	3	0.6

Qualifications	Frequency (n)	Percentage (%)
Missing	1	0.0
Total	**477**	**100.0**

According to Table 6.4, the majority of respondents (56.3 per cent) had experience working as clerks, secretaries, drivers and domestic workers, immediately before engaging in farming; followed by 21.4 per cent who had experience as supervisors (first-line management) immediately before becoming farmers. Only 0.6 per cent of the respondents served in top management positions immediately before engaging in farming.

Table 6.4: Respondents' past experience immediately before farming

Experience	Frequency (n)	Percentage (%)
Unemployed	17	3.6
Worker (clerk, secretary, driver, domestic worker)	268	56.3
Self-employed (owned a business)	23	4.8
Supervisor (first-line management)	102	21.4
Middle management	60	12.6
Top management (executive)	3	0.6
Other	3	0.6
Missing	1	0.1
Total	**477**	**100.0**

Table 6.5 presents the respondents' area or region of farming. The majority of respondents (49.9 per cent) reside in the Omaheke region, followed by the Khomas region (18.3 per cent), and the Hardap region (12.4 per cent). In line with the purposive sampling method used in this study, as stated in chapter five, the Omaheke, Khomas and Hardap regions were prioritised for data collection for reasons of cost, time and availability of the population, given their proximity to the administrative centre of the survey, Windhoek. The Omaheke region is generally regarded as being dominant in livestock farming, particularly cattle farming. This represents a further justification for the sample to be representative of the population of this study, since livestock, particularly cattle farming, is the main agricultural production sector in Namibia (Hangara, Teweldemedhin & Groenewald, 2011:141).

Table 6.5: Respondents' area (region) of farming

Region	Frequency (n)	Percentage (%)
Omaheke	237	49.9
Khomas	87	18.3
!Karas	17	3.6
Hardap	59	12.4
Erongo	15	3.2
Otjozondjupa	53	11.2
Kunene	7	1.5
Missing	2	-0.1
Total	**477**	**100.0**

As for the government support scheme of respondents (Table 6.6), most of the respondents (58.2 per cent) have benefited from the NRP scheme by acquiring agricultural land. This is supported by the fact that government, in terms of its land redistribution policy, buys commercial farms and charges resettled farmers a negligible rental fee annually for the land. Respondents under the AALS represent 41.8 per cent of the total.

Table 6.6: Government support scheme for farming

Government support scheme	Frequency (n)	Percentage (%)
National Resettlement Programme (NRP)	276	58.2
Affirmative Action Loan Scheme (AALS)	198	41.8
Missing	3	0.0
Total	**477**	**100.0**

In terms of respondents' main farming activity (Table 6.7), the majority of respondents (75.5 per cent) are engaged in livestock farming, followed by horticulture at 18.2 per cent. Grains are at a negligible 0.2 per cent.

Table 6.7: Respondents' main farming activity

Main farming activity	Frequency (n)	Percentage (%)
Livestock	360	75.5
Grains	1	0.2
Horticulture	87	18.2
Mixed farming system	29	6.1
Other	0	0
Total	**477**	**100.0**

These statistics are representative of the population of this study, since the majority of Namibian farmers practise livestock farming, as previously stated.

Table 6.8 presents the respondents' form of business ownership. Most of the respondents (59.1 per cent) indicated that their farming operations were not registered; the reason being that the majority of those under the NRP scheme are resettled in loose groups, and they are not in cooperatives either. Farmers in sole proprietorship (15.7 per cent), who ordinarily are the beneficiaries of the AALS, followed unregistered farmers. Sole proprietors usually buy commercial farmland as individuals (family) and register it as such at the Deeds Office. The third most common legal business form (13.6 per cent) was represented by those who buy commercial farmland and register it as a close corporation.

Table 6.8: Respondents' legal business form (form of business ownership)

Legal business form	Frequency (n)	Percentage (%)
Sole proprietorship	74	15.7
Cooperative	8	1.7
Partnership	25	5.3
Close corporation	64	13.6
Not registered	278	59.1
Other	21	4.5
Missing	7	0.1
Total	**477**	**100.0**

In terms of annual turnover of farming operations (Table 6.9), the majority of respondents (53.5 per cent) earned less than N$50,000.00 annually from their farming operations. This was followed at 28.0 per cent, by those who earned between N$101,000.00 and N$500,000.00 annually from their farming operations. Only 0.2 per cent earned above N$1 million.

Table 6.9: Turnover (annual sales) of farming operation (N$)

Turnover (annual sales)	Frequency (n)	Percentage (%)
50 000 and less	254	53.5
51 000 – 100 000	70	14.7
101 000 – 500 000	133	28.0
501 000 – 1 million	16	3.4
Above 1 million	1	0.2

Turnover (annual sales)	Frequency (n)	Percentage (%)
Other	1	0.2
Missing	2	0.0
Total	**477**	**100.0**

What the descriptive statistical analysis demonstrates is that the average respondent is male, between 40 and 60 years of age, not well educated, inexperienced at upper management levels, farms with livestock mainly in the Omaheke region, and earning an average of N$50,000.00, if not less, annually.

The issue of whether the variables in the data collection instrument (questionnaire) were normally distributed is not addressed as PLS-SEM does not make assumptions about normal distribution (Hair *et al.*, 2012:321).

6.3   INFERENTIAL STATISTICAL ANALYSIS

As stated in chapters four and five, PLS-SEM is the statistical technique adopted for data analysis is this study. It consists of the measurement model and structural model. Upon reflection, the construct of supportive environment was re-operationalised into two components, namely, the supportive environment (SE) and the cooperative environment (CE). This ensured better item loadings on the indicators, and better indicator contribution to respective constructs (Schumacker & Lomax, 2010:205).

Various authors (Kiggundu, 2002:245; Gnyawali & Fogel, 1994:45; Nieuwenhuizen & Nieman, 2014:12-13) categorised the supportive environment, with legal regulations and rules, counselling and mentorship, and laws on property rights and bankruptcy, making up the construct. The cooperative environment is constituted by factors such as universities' and high schools' curricula on entrepreneurship, entrepreneurial networks, financial services, business education, public attitude toward entrepreneurs, and government procurement programmes for small businesses. In this study, the revised indicators for SE and CE draw from this categorisation.

Two indicators, namely, role model (RM) and mentorship (MO) were removed owing to their non-significant loading to SE and EC, respectively.

6.3.1 Measurement models

The statistical results of the various measurement models for each construct of the AEDM are presented in the following paragraphs. The results cover outer loadings of the items on the respective indicator, individual indicator reliability, and the contribution of each indicator to its construct as measured by average extracted variance (AVE). Composite reliability and discriminant validity are also reported. The software for partial least square known as SmartPLS (Ringle *et al.*, 2015) was used to analyse the measurement models. SmartPLS is used in PLS-SEM, which is the chosen approach for this study, as it is suitable for exploratory analysis, theory building, theory testing and causal-predictive analysis (Lowry & Gaskin, 2014:130-132). The results of the measurement models are reported in table format.

Table 6.10 contains the abbreviations of the constructs and concepts used in the analysis.

Table 6.10: Abbreviations for PLS-SEM analysis

Abbreviation	Description
AB	Agricultural business
AP	Agricultural productivity
AS	Agricultural sustainability
ASU	Agricultural start-ups
AVE	Average extracted variance
BS	Business skills
CC	Climate change
CE	Cooperative environment
CO	Competitiveness
CU	Culture
EBS	Ecosystem, biodiversity, soil erosion
EC	Entrepreneurial competencies
EP	Entrepreneurial performance
E&T	Education and Training
ES	Entrepreneurial skills
FS	Financial support
INC	Increased incomes

Abbreviation	Description
LIV	Improved livelihoods
MC	Market conditions
MO	Mentorship
NFS	Non-financial support
R	Risk-taking
RF	Regulatory framework
P	Pro-activeness
RM	Role models
PM	Performance motivation
SC	Social capital
SE	Supportive environment
T&I	Technology & Innovation
TS	Technical skills
VIF	Variance inflation factor
XS	Extension services

6.3.1.1 Measurement model for EP

EP, a reflective latent construct, was measured by the following indicators: growth in agricultural business (AB), agricultural start-ups (ASU), and competitiveness (CO).

Table 6.11 reports the results for outer loadings, indicator reliability, composite reliability and AVE for the reflective construct of EP.

Table 6.11: Statistical analysis for EP

Indicator	Outer loadings	Indicator Reliability (loadings^2)	Composite Reliability	AVE
AB	0.737	0.543		
ASU	0.852	0.726	0.844	0.644
CO	0.813	0.661		

All three indicators AB (0.543), ASU (0.726) and CO (0.661) yield individual indicator reliability values that are higher than the recommended minimum of 0.4 for exploratory research. The preferred level is 0.7. The composite reliability value of 0.844 is higher than the recommended level of 0.7, and the acceptable level of 0.6 in the case of an exploratory research (Wong, 2013:21). This contributes towards supporting internal consistency reliability for EP.

As stated in chapter five (refer to Table 5.3 for a summary of reliability and validity measures followed for reflective constructs), convergent and discriminant validity determine validity in reflective outer models. As for convergent validity, the AVE value of 0.644 is greater than the recommended minimum of 0.5 (Hair *et al.*, 2011:146; Wong, 2013:21). Consequently, convergent validity is supported.

According to the Fornell-Lacker criterion, the AVE of each latent construct should be greater than the latent construct's highest squared correlation when compared with any other latent construct (Hair *et al.*, 2011:146). However, as AVE is a more conservative measure than composite reliability, the researcher may conclude, on the basis of composite reliability, that the convergent validity of the latent construct is acceptable, even though more than 50 per cent of the variance is attributable to error (Fornell & Larcker, 1981:46).

In Table 6.12, discriminant validity for EP (0.802) is larger than all the correlation values in its row (0.466, 0.509, 0.712 and 0.694), and all the correlation values in its column (0.723, 0.000, 0.759 and -0.542). This provides supporting evidence for confirming discriminant validity.

Table 6.12: Fornell-Larcker criterion analysis for checking discriminant validity

	AP	AS	EC	EO	EP	INC	LIV	SE	CE
AP	1.000								
AS	0.527								
EC	0.766	**0.414**	**0.730**						
EO	0.675	0.294	0.622	**0.584**					
EP	0.694	0.712	0.509	0.466	**0.802**				
INC	0.881	0.505	0.773	0.671	0.723	**1.000**			
LIV	0.200	0.054	0.040	-	0.000	0.116	**1.000**		

	AP	AS	EC	EO	EP	INC	LIV	SE	CE
				0.031					
SE	0.788	0.652	0.659	0.511	0.759	0.764	-0.038	**0.733**	
CE	-0.501	-0.497	-0.488	-0.522	-0.542	-0.519	0.141	-0.558	**0.542**

6.3.1.2 Measurement model for SE

SE, a reflective latent construct, was measured using the indicators regulatory framework (RF), non-financial support (NFS), and social capital (SC). As indicated above, SE was re-operationalised into two components, namely, SE and CE. Role model (RM) was removed as an indicator, owing to its non-significant loading on SE. Excluding of RM also yielded improved item loadings on the remaining indicators, and better indicator contribution to the respective constructs.

Table 6.13 reports the results for outer loadings, indicator reliability, composite reliability and AVE for SE.

Table 6.13: Statistical analysis for SE

Indicator	Outer loadings	Indicator Reliability (loadings^2)	Composite Reliability	AVE
NFS	0.352	0.124		
RF	0.911	0.830	0.756	0.538
SC	0.813	0.661		

According to Table 6.13, RF and SC reported individual indicator reliability values of 0.830 and 0.661, respectively. Whilst NFS had a loading of 0.124, which is less than the recommended value of 0.4, the structural contribution was deemed relevant given the composite reliability and AVE values. Composite reliability and AVE values were higher than the recommended 0.6 and 0.5, respectively. As reported in Table 6.12, discriminant validity for SE (0.733) is higher than the correlation value in its column (-0.558), and larger than the correlation values in its row (-0.038, 0.511, 0.659 and 0.652). INC (0.764), EP (0.759) and AP (0.788) show values only marginally higher than 0.733. These are therefore considered to contribute towards supporting internal consistency reliability and convergent validity. Discriminant validity for SE is also supported.

6.3.1.3 Measurement model for CE

The indicators of culture (CU), education and training (E&T), financial support (FS) and market conditions (MC) measured CE, a reflective latent construct.

Table 6.14 reports the results for outer loadings, indicator reliability, composite reliability and AVE for the reflective construct of CE.

Table 6.14: Statistical analysis for CE

Indicator	Outer loadings	Indicator Reliability (loadings^2)	Composite Reliability	AVE
CU	0.640	0.409	0.614	0.294
ET	0.456	0.208		
FS	0.644	0.415		
MC	0.378	0.143		

Table 6.14 indicates that only CU (0.409) and FS (0.415) have individual indicator reliability values above the recommended 0.4, with both ET (0.208) and MC (0.143) falling below the minimum level. However, composite reliability (0.614) is higher than the recommended 0.6, signifying that the reflective latent construct is reliable as a whole. Even though AVE falls below the recommended 0.5, composite reliability is adequate to confirm convergent validity for this construct (Fornell and Larcker, 1981:46). Regarding the discriminant validity reported in Table 6.12, the CE (0.542) is higher than the correlation values in its row. Consequently, the results provide support for discriminant validity.

6.3.1.4 Measurement model for EO

The indicators Risk-taking (R), pro-activeness (P), and technology and innovation (T&I) measured, EO, a reflective latent construct.

Table 6.15 reports the results for outer loadings, indicator reliability, composite reliability and AVE for the reflective construct of EO.

Table 6.15: Statistical analysis for EO

Indicator	Outer loadings	Indicator Reliability (loadings^2)	Composite Reliability	AVE
P	0.584	0.341		
R	0.555	0.308	0.608	0.341
T&I	0.613	0.376		

According to Table 6.15, P (0.341), R (0.308) and T&I (0.376) all have individual indicator values lower than the recommended 0.4 and the preferred value of 0.7. Composite reliability (0.608) is higher than the recommended 0.6, while the AVE value is lower than the recommended 0.5. Therefore, convergent validity is supported on the basis of composite reliability (Fornell & Larcker, 1981:46). Table 6.12 indicates that discriminant validity for EO (0.584) is higher than the correlation values in its column with regard to EP (0.466), LIV (-0.031), SE (0.511) and CE (-0.522). Only INC (0.671) reported a higher value. Apart from AS (0.294) the value for EO is also lower than the correlation values (0.622 and 0.675) in its row. The results provide support for discriminant validity for EO.

6.3.1.5 Measurement model for EC

Entrepreneurial skills (ES), business skills (BS), technical skills (TS), and performance motivation (PM) were indicators used to measure EC, a reflective latent construct. Mentorship (MO) was removed as an indicator owing to its non-significant loading on EC.

Table 6.16 reports the results for outer loadings, indicator reliability, composite reliability and AVE for the reflective construct of EC.

Table 6.16: Statistical analysis for EC

Indicator	Outer loadings	Indicator Reliability (loadings^2)	Composite Reliability	AVE
ES	0.377	0.142		
BS	0.919	0.845	0.809	0.533
TS	0.719	0.517		
PM	0.794	0.630		

Apart from ES (0.142), individual indicator reliability values are higher than the recommended minimum of 0.4. Composite reliability and AVE values are above the

recommended minimum of 0.6 and 0.5, respectively. This provides support for internal consistency reliability and convergent validity for EC. According to Table 6.12, discriminant validity for EC (0.730) is higher than the correlation values in its row (0.414), but lower than AP (0.766). It is higher than EO (0.622), EP (0.509), LIV (0.040), SE (0.659) and CE (-0.488), and only lower than INC (0.773) in its column. Discriminant validity for EC is supported.

6.3.1.6 Measurement model for AS

The formative latent construct, AS, was measured by the indicators agricultural extension services (XS); ecosystem, biodiversity, soil erosion (EBS); and climate change (CC).

Table 6.17 presents the statistical results for AS in terms of outer weights, outer VIF values, and T-statistics.

As indicated in chapter five, weight is the primary statistic for assessing formative indicators' relative contribution to the latent construct. In formative constructs, indicators might correlate positively or negatively, or may lack any correlation. In other words, indicators could have either a positive or negative relationship with the latent construct, but they have the same effect on the latent construct (Diamantopoulos *et al.,* 2008:1205). Therefore, in Table 6.17, CC, XS and EBS all contribute to AS. The T-statistics indicate that all path coefficients between indicators and AS are significant as they are more than 1.96 at 5% confidence level using a two-tailed t-test.

Table 6.17: Statistical analysis for AS

Indicator	Outer weights	T Statistic	Outer VIF values
XS	0.724	13.648	1.150
EBS	0.597	11.159	1.171
CC	-0.588	8.392	1.174

According to Hair *et al.* (2011:145), a VIF value of 5 or lower should be obtained in order to avoid collinearity. All outer VIF values for indicators of the formative construct AS are less than 5 as indicated in Table 6.17. Similarly, inner VIF values for all exogenous constructs

are lower than 5 as reported in Table 6.18. This is confirmation that multicollinearity does not affect this study.

Table 6.18: Inner VIF values for the exogenous constructs

	AP	AS	EC	EO	EP	INC	LIV	SE	CE
AP									
AS					1.857				
EC					2.203				
EO	1.000				1.853	1.000	1.000		
EP									
INC									
LIV									
SE					2.689				
CE					1.742				

In conclusion, even though not all reliability and validity measures met the recommended criteria, on the basis of the interplay of different reliability and validity indicators, it was concluded that the data fit the measurement models. This constitutes sufficient ground to proceed to structural model analysis.

The following paragraphs present the results of the structural model, and their implications for the hypotheses stated for this study. As outlined in chapter four, the structural model refers to the hypothesized relationships among the constructs (Ullman & Bentler, 2012:662).

6.3.2 Structural model

The coefficient of determination (R^2) and the level of significance of the path coefficients are the primary evaluation criteria of the structural model or inner model. The amount of explained variance for each endogenous construct is indicated by the R^2, coefficient of determination. Paths that show signs contrary to the hypothesised relationship or direction are non-significant and do not support the proposed causal relationship, whereas those showing signs in line with the hypothesised relationship are significant and support the proposed causal relationship (Hair *et al.*, 2011:147; Hair, Sarstedt, Ringle, *et al.*, 2012:426;).

Since PLS-SEM aims to explain the endogenous latent construct's variance, R^2 values should be high, the extent to which, depends on the research topic or discipline. As mentioned in chapter five, this study adopts 0.30–0.49 R^2 values as the minimum, in view of the infancy of research in agricultural entrepreneurship. The study uses tables and a diagram to report the results of the structural model. The revised structural model is represented in Figure 6.1, and shows the path coefficients for the exogenous constructs on EP, the path coefficients for entrepreneurial outcomes, namely, agricultural productivity (AP), increased incomes (INC), and improved livelihoods (LIV). Coefficients of determination are shown for EP, AP, INC and LIV. This study also reports the T-statistics of path coefficients.

Figure 6.1: Structural model with direct effects
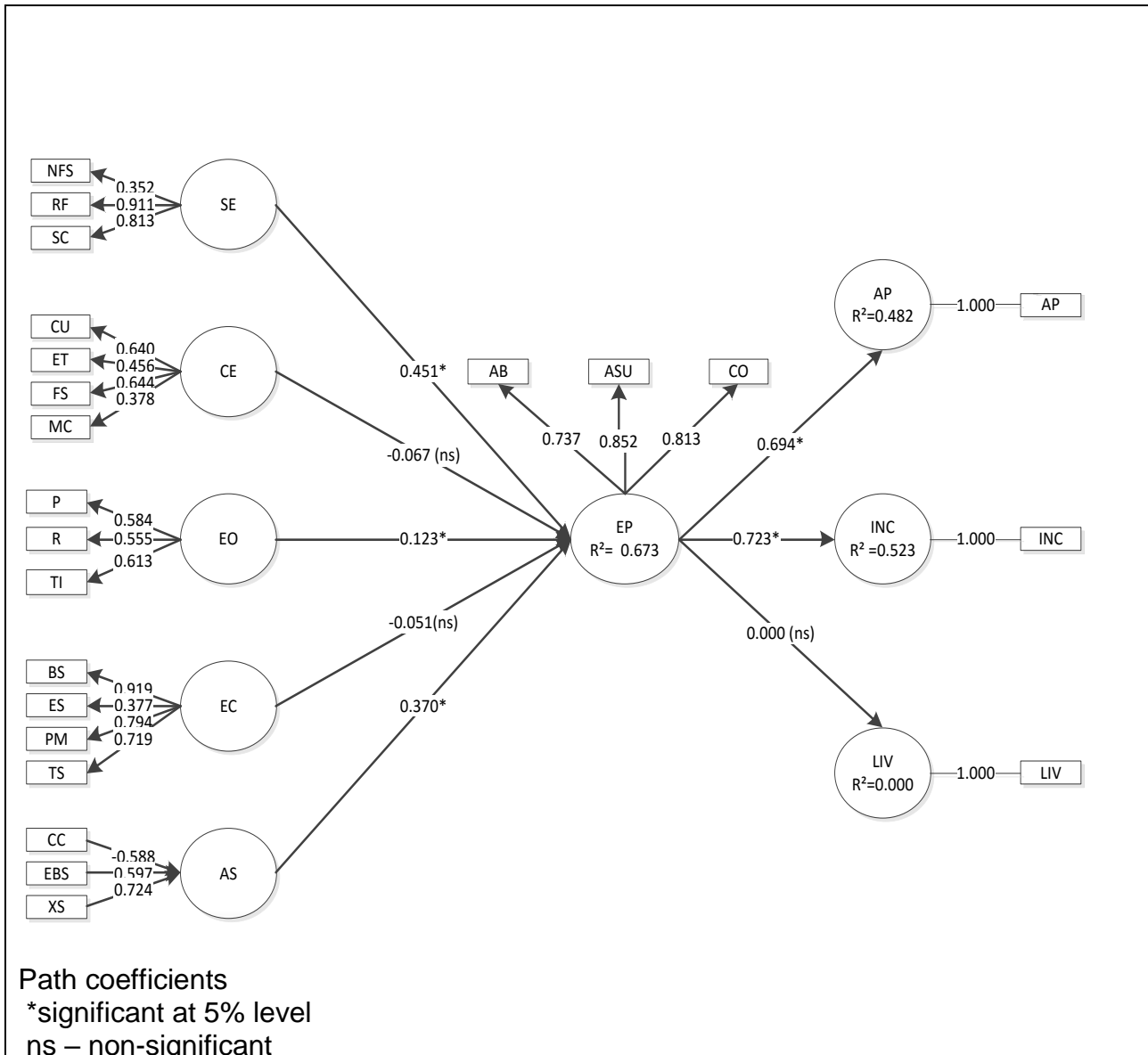
In this structural model, R^2 for the EP endogenous latent construct is 0.673, which means that the five exogenous latent constructs (SE, CE, EO, EC and AS) substantially explain 67.3 per cent of the variance in EP. This is lower than the 0.75 recommended as the norm for "substantial" by Hair *et al.* (2011:147), but higher than the minimum of 0.25 recommended by Wong (2013:5). Given the exploratory nature of this study and the infancy of the field of agricultural entrepreneurship, an R^2 value of 67.3 was deemed acceptable. The coefficient of determination for the endogenous constructs of AP, INC and LIV, are 0.482, 0.523 and 0.000, respectively. This is neither substantial nor weak, but it means that EP moderately explains the variance in AP and INC, and it is higher than the recommended minimum of 0.25. There is no relationship between EP and LIV.

For the exogenous constructs (SE, CE, EO, EC and AS) and the endogenous construct of EP, the hypothesised path relationships are positive and statistically very significant between SE/EP (0.451), followed by AS/EP (0.370), and EO/EP (0.123). Being more than 0.4, the SE/EP signifies a very strong relationship (Lehner & Haas, 2010:82).

The impact of the exogenous latent construct on the endogenous latent construct is measured by f^2, and effect sizes of 0.02, 0.15, and 0.35 are considered small (weak), medium (moderate), and large (strong), respectively (Hair *et al.*, 2013:7; Henseler & Chin, 2010:105). As demonstrated by the values of the path coefficients above, the effect size for SE is the strongest on EP, followed by AS, whilst EP reflects the largest effect size on the endogenous outcome constructs AP (0.694) and INC (0.723). EC and CE exhibit non-significant hypothesised path relationships with EP.

Wong (2013:24) asserts that the path coefficient will be significant if the T-statistic is larger than 1.96, using a two-tailed t-test at a 5% level of significance. In the context of this study, this is reported in Table 6.19.

Table 6.19: T-statistic of path coefficients (Inner Model)

	T Statistic
AS -> EP	6.863*
EC -> EP	1.105
EO -> EP	2.253*
EP -> AP	25.350*
EP -> INC	31.359*
EP -> LIV	0.012
SE -> EP	7.637*
CE -> EP	1.466

*significant at the 5% level

6.3.3 Hypothesis testing

Re-visiting the hypotheses stated for this study in chapter five, the following deductions can be made:

H_01: SE does not influence EP directly and positively.

H_a1: SE influences EP directly and positively.

The hypothesised path relationship between supportive environment and entrepreneurial performance is statistically significant, and has strong path coefficients. **Hypothesis $H_0 1$ is rejected.**

$H_0 2$: CE does not influence EP directly and positively.

$H_a 2$: CE influences EP directly and positively.

The hypothesised path relationship between cooperative environment and entrepreneurial performance is statistically non-significant, and has weak path coefficients. **Hypothesis $H_0 2$ cannot be rejected.**

$H_0 3$: EO does not influence EP directly and positively.

$H_a 3$: EO influences EP directly and positively.

The hypothesised path relationship between entrepreneurial orientation and entrepreneurial performance is statistically significant, and has moderate path coefficients. **Hypothesis $H_0 3$ is rejected.**

$H_0 4$: EC do not influence EP directly and positively.

$H_a 4$: EC influence EP directly and positively.

The hypothesised path relationship between entrepreneurial competencies and entrepreneurial performance is statistically non-significant, and has weak path coefficients. **Hypothesis $H_0 4$ cannot be rejected.**

$H_0 5$: AS does not influence EP directly and positively.

$H_a 5$: AS influences EP directly and positively.

The hypothesised path relationship between agricultural sustainability and entrepreneurial performance is statistically significant, and has moderate path coefficients. **Hypothesis $H_0 5$ is rejected.**

$H_0$6: EP does not influence agricultural productivity directly and positively.

H_a6: EP influences agricultural productivity directly and positively.

The hypothesised path relationship between entrepreneurial performance and agricultural productivity is statistically significant, and has very strong path coefficients. **Hypothesis $H_0$6 is rejected.**

$H_0$7: EP does not influence increased incomes directly and positively.

H_a7: EP influences increased incomes directly and positively.

The hypothesised path relationship between entrepreneurial performance and increased incomes is statistically significant, and has very strong path coefficients**. Hypothesis $H_0$7 is rejected.**

$H_0$8: EP does not influence improved livelihoods directly and positively.

H_a8: EP influences improved livelihoods directly and positively.

The hypothesised path relationship between entrepreneurial performance and improved livelihoods is statistically non-significant. **Hypothesis $H_0$8 cannot be rejected**.

The following section discusses the findings, how they address the problem statement, research questions, research objectives, and their relation to the literature.

6.4   DISCUSSION OF FINDINGS

Supportive Environment (SE) – the results (Hypothesis $H_0$1) confirmed a positive and very significant relationship between SE and EP. This means that SE, as represented by regulatory framework, non-financial support and social capital (networking), is an important component in enhancing EP in agriculture, in the context of this study. This is in line with literature on SE (Carlsson *et al.*, 2013; Gnyawali & Fogel, 1994; Kiggundu, 2002; Klyver *et*

al., 2008) which purports that the above factors are necessary for creating an enabling environment for EP.

Cooperative Environment (CE) – The results (Hypothesis $H_0 2$) confirmed a non-significant relationship between CE and EP, meaning that CE, as represented by culture, financial support, education and training, and market conditions, has no influence on EP. This outcome contradicts the literature on CE (He, 2009; Lans *et al.*, 2014; Morris *et al.*, 2013; Nieuwenhuizen & Nieman, 2014) which advocates for the presence of a positive attitude (culture), access to financial resources, and the provision of education and training with a bias in entrepreneurship as important elements for promoting EP in any setting, including agriculture. Based on what literature expounds regarding CE, there is therefore a need to explore this relationship further.

Entrepreneurial Orientation (EO) – The results of this construct (Hypothesis $H_0 3$) confirmed a positive and significant relationship with EP. This means that EO, as represented by risk-taking, pro-activeness, and technology and innovation, plays a pivotal role in promoting EP. This outcome corroborates literature on EO (Colvin & Slevin, 1989; Le Roux & Bengesi, 2014; Lumpkin & Dess, 1996; Miller, 1983; Sarri *et al.*, 2010; Suman *et al.*, 2014) which reasserts that EO is crucial for enhancing EP in agriculture.

Entrepreneurial Competencies (EC) – The results (Hypothesis $H_0 4$) confirmed a non-significant relationship between EC and EP, which means that EC, as encapsulated by entrepreneurial skills, business skills, performance motivation and technical skills, has no relationship with EP, and does not influence it. On the contrary, literature (Antonites, 2003; Chang, 2009; Morris *et al.*, 2013; Timmons & Spinelli, 2007) supporting the notion that the above factors constituting EC, are necessary for the enhancement of EP, exists. Consequently, a further investigation of the relationship between EC and EP may be warranted.

Agricultural Sustainability (AS) – The results for this construct (Hypothesis $H_0 5$) confirmed a positive and significant relationship with EP, implying that AS, as represented by extension services (the provision of technical support and infrastructure to farmers), climate change (change in weather patterns that results in drought and floods), and ecosystem, biodiversity and soil erosion (preservation of natural resources such as plants and animals, and the proper management of land), plays a catalytic role in promoting EP in the agriculture sector. This is in line with literature on AS (Dale *et al.,* 2013; Hall *et al.*,

2010; Müller *et al.*, 2011; Nkambule & Dlamini, 2012; Pretty, 2008; World Bank, 2011) which asserts that for EP to be enhanced, the issue of agricultural sustainability needs to be taken seriously by addressing the above factors constituting AS.

Agricultural Productivity (AP) – The results (Hypothesis $H_0 6$) confirmed a positive and very significant relationship between EP and AP, where EP resulted in increased agricultural productivity. This is in agreement with literature (Cumming & Fischer, 2013), which advocates for governments to support entrepreneurial activity and entrepreneurial performance that can result in entrepreneurial outcomes such as growth or agricultural productivity in the context of this study.

Increased Incomes (INC) – Results (Hypothesis $H_0 7$) confirmed a positive and very significant relationship between EP and INC with EP resulting in increased incomes. This outcome supports literature (Cumming & Fischer, 2013; Yusuf, 2010) whereby growth in agricultural productivity as a result of enhanced entrepreneurial performance, can lead to income generation or increased incomes in the context of this study.

Improved Livelihood (LIV) – In the case of this construct, the results (Hypothesis $H_0 8$) yielded a non-significant relationship between EP and LIV, meaning that EP does not result in LIV. This is in contrast to literature (Cumming & Fischer, 2013; Yusuf, 2010) which purports that EP gives rise to entrepreneurial outcomes, namely, growth (agricultural productivity), income generation (increased incomes), and increased standard of living (improved livelihoods). The empirical finding that EP in agricultural activities leads to INC but not to LIV appear counter-intuitive at first sight, and needs further investigation in order to be explained and confirmed.

Overall, the results demonstrated that the data fit the model, and address the problem statement, the research questions, research objectives, and the hypotheses. Exceptions were encountered with CE and EC, where the null hypothesis could not be rejected as no relationship between these exogenous constructs and the endogenous construct EP could be established.

6.5   SUMMARY

The chapter presented the data analysis for this study. Initially, descriptive statistics pertaining to biographical information of respondents were presented.

Secondly, inferential statistics were reported. Results of the measurement models for the respective constructs (supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies, agricultural sustainability and entrepreneurial performance) of the AEDM were summarised in table format and discussed in detail.

Inferential statistics also included results of the structural model of entrepreneurial performance. Exogenous constructs (supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies and agricultural sustainability) yielded a substantial explanatory power (R^2 = 0.673), which means that they explained 67.3 per cent of the variance in entrepreneurial performance. All but two exogenous constructs showed positive and significant path coefficients for their relationship with entrepreneurial performance. The exogenous latent constructs of cooperative environment and entrepreneurial competencies showed non-significant hypothesised path relationships and weak path coefficients with entrepreneurial performance. This resulted in two null hypotheses ($H_0 2$ and $H_0 4$) not being rejected. Further investigation of these statistically non-significant relationships is warranted as theory purports that these concepts are crucial for entrepreneurship development and entrepreneurial performance. Results were also presented on entrepreneurial outcomes as manifested by AP, INC and LIV. EP moderately explained the variance in AP and INC, but no relationship was found between EP and LIV. The chapter concluded with a discussion of the findings.

The next chapter will present a summary of the findings in relation to research questions, research objectives and hypotheses. It will draw conclusions and make recommendations for future research. Contributions and limitations of the study will also be highlighted.

CHAPTER 7
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

The primary objective of this study was to build a developmental model for agricultural entrepreneurship; the purpose being the enhancing and developing of entrepreneurial performance in the agricultural sector. As stated in chapter three, the extant literature contains no appropriate and suitable model that addresses the construct of agricultural-entrepreneurial development. Consequently, a model was derived from existing scientific evidence in the field of entrepreneurship and encapsulated in an agricultural environmental context. The following constructs of supportive environment, cooperative environment, entrepreneurial orientation, agricultural sustainability, entrepreneurial competencies, entrepreneurial performance, and entrepreneurial outcomes constituted the model, and formed the basis for empirical testing.

This chapter presents the summary, conclusions and recommendations of the study. It summarises the theoretical background and the findings with regard to the hypothesised relationships underlying the AEDM and draws conclusion on the implications of the findings regarding agricultural-entrepreneurship and economic development. The implications and recommendations stemming from this study are discussed for both theory and practice.

7.2 SUMMARY OF THE FINDINGS

7.2.1 Findings from theory

Literature review revealed that agriculture is important to economic development. It also highlighted the fact that agriculture can greatly contribute to economic development if it is undertaken in a sustainable manner taking into account the phenomenon of climate change and the importance of ecosystem and biodiversity preservation, conservation of natural resources, and avoidance of land degradation and soil erosion (Dale *et al.*, 2013; Meijerink & Roza, 2007; Nkambule & Dlamini, 2012; Pretty, 2008; World Bank, 2008).

Literature also highlighted that entrepreneurship is recognised as a vehicle for transformation to sustainable products and processes, and as a possible solution to many social and environmental concerns. Entrepreneurs are regarded as drivers and shapers of innovation, and can help bring about greater efficiency to the agriculture and other extraction industries (Hall *et al.*, 2010; Kelley *et al.*, 2010).

The concepts of entrepreneurial orientation, entrepreneurial competencies, supportive environment, cooperative environment and agricultural sustainability have been associated with the creation of an enabling environment for entrepreneurial performance (Antonites, 2003; Duval-Couetil, 2013; Gnyawali & Fogel, 1994; Kollmann & Stöckmann, 2014; Lumpkin & Dess, 1996; Morris *et al.*, 2013; Nieuwenhuizen & Nieman, 2014). Entrepreneurial outcomes, which Cumming and Fischer (2013:467,480) refer to as growth and innovation, may be fostered through the enhancement of entrepreneurial performance. In the context of this study, entrepreneurial outcomes were articulated as by-products of entrepreneurial performance and represented by agricultural productivity, increased incomes, and improved livelihoods of the beneficiary farmers.

7.2.2 Findings from empirical research

The empirical part of the study validated the AEDM as exhibiting the exogenous latent constructs of supportive environment, entrepreneurial orientation and agricultural sustainability. The results substantiated the hypothesised relationships between the above exogenous constructs and the endogenous construct of entrepreneurial performance. It was confirmed that they directly and positively influence entrepreneurial performance, and are therefore critical elements in the development of agricultural entrepreneurship and enhancement of entrepreneurial performance.

Empirical testing, however, did not validate cooperative environment and entrepreneurial competencies as important drivers of entrepreneurial performance, although (Antonites, 2003; Bonnafous-Boucher *et al.*, 2011; Chang, 2009; Duval-Couetil, 2013; Gnyawali & Fogel, 1994; Lans *et al.*, 2014; Morris *et al.*, 2013; Nieuwenhuizen & Nieman, 2014; Robichaud *et al.*, 2001) argues to the contrary. In view of these study's findings, which appear to be in dissonance with the literature, the two constructs' relationship with

entrepreneurial performance, in the context of agricultural entrepreneurship, could be investigated further.

The study confirmed the theoretical assertion that entrepreneurial performance results in entrepreneurial outcomes as reflected by agricultural productivity and increased incomes. It did not, however, confirm improved livelihoods for beneficiary farmers as an entrepreneurial outcome dependent on entrepreneurial performance. Further investigation of the relationship between entrepreneurial performance and improved livelihoods may be warranted because the empirical finding that EP in agricultural activities leads to INC, but not to LIV, appears counter-intuitive at first.

7.3   CONTRIBUTION OF THE STUDY

As pointed out by Richards and Bulkley (2007:3) there has been minimal scholarly or empirical research on the role of entrepreneurship and entrepreneurial performance in the agriculture sector. Kshetri (2011:11) opines that in Sub-Saharan Africa, the biggest barrier to entrepreneurial performance has been the lack of entrepreneurial skills and poor or non-existent support structures. The extant literature (Modiba, 2009; Suman *et al.*, 2014; Zhou *et al.*, 2013) confirms the scarcity and or inappropriateness of models on agricultural entrepreneurial development. The problem statement for this study, accordingly, is the lack of developmental support models for agricultural entrepreneurial performance.

The study fills this gap by deriving a model, which promotes an entrepreneurial approach to agricultural development. In so doing, it develops a conceptual model from theory about how entrepreneurial performance in agriculture can be fostered. The study depicts agricultural productivity, increased incomes and improved livelihoods as the entrepreneurial outcomes, which should derive from entrepreneurially oriented agricultural practices.

The specific contributions of this study to theory and practice are outlined in the following sections.

7.3.1 Contribution to the scientific body of knowledge

From a literature perspective, the study adds to the existing scholarly body of knowledge on entrepreneurship, and specifically agricultural entrepreneurship, by:

- Identifying factors in the external environment that act as enablers of entrepreneurial performance in the agriculture sector. There is literature consensus (Antonites, 2003; Kiggundu, 2002; Morris *et al.*, 2013; Nieuwenhuizen & Nieman, 2014; Nkambule & Dlamini, 2012; Le Roux & Bengesi, 2014; Lumpkin & Dess, 1996; Suman *et al.*, 2014) that SE, CE, EO, EC and AS are external environmental factors that stimulate entrepreneurial performance in agriculture. However, for the constructs of CE and EC, empirical testing did not confirm that they influence entrepreneurial performance positively;

- Developing a framework for measuring entrepreneurial performance in the agriculture sector. In order to inform the conceptualization of the AEDM, the study develops a conceptual framework which rests on the premise that an enabling environment encapsulating environmental variables contained in some of the models reviewed (Antonites, 2003; Covin & Slevin, 1991; Gnyawali & Fogel, 1994; Lahiff, 2007; Modiba, 2009; Nieuwenhuizen & Nieman, 2014; Zahra, 1993; Suman *et al.*, 2014; Zhou *et al.*, 2013), creates the necessary condition for fostering entrepreneurial performance. This in turn, leads to entrepreneurial outcomes of agricultural productivity, increased incomes, and improved livelihoods. The AEDM can serve as a starting point so that future research on development models for agricultural entrepreneurship, can take place.

From an empirical perspective the study contributes to theory, by testing the conceptual AEDM empirically, and more specifically by:

- Empirically testing the model, culminating in a final version of the AEDM as depicted in Figure 7.1. The study thus contributes to theory and empirically validated AEDM. The final AEDM reflects the results of empirical testing and illustrates statistically significant directional relationships, which have been verified. Accordingly, it does not depict CE and EC, and their relationship with EP, as they were found to have no positive influence on the latter;

- Empirically testing the impact the enabling environment dimensions have on entrepreneurial performance in agriculture, and the influence of entrepreneurial performance on the development of entrepreneurial outcomes in agriculture. The findings, already outlined above, are reflected in Figure 7.1;

- Confirming that SE, EO and AS have a positive and significant impact on entrepreneurial performance. This finding justifies their inclusion in the enabling environment part of the AEDM;

- Revealing that cooperative environment and entrepreneurial competencies have a negative impact on entrepreneurial performance. This finding is in contrast with previous research, and opens up areas of investigation on agricultural entrepreneurship and enabling environment dimensions;

- Demonstrating that entrepreneurial performance influences the entrepreneurial outcomes of agricultural productivity and increased incomes positively and significantly. This finding supports previous research and justifies the inclusion of agricultural productivity and increased incomes as outcomes of this study.

Figure 7.1: Final AEDM after empirical testing
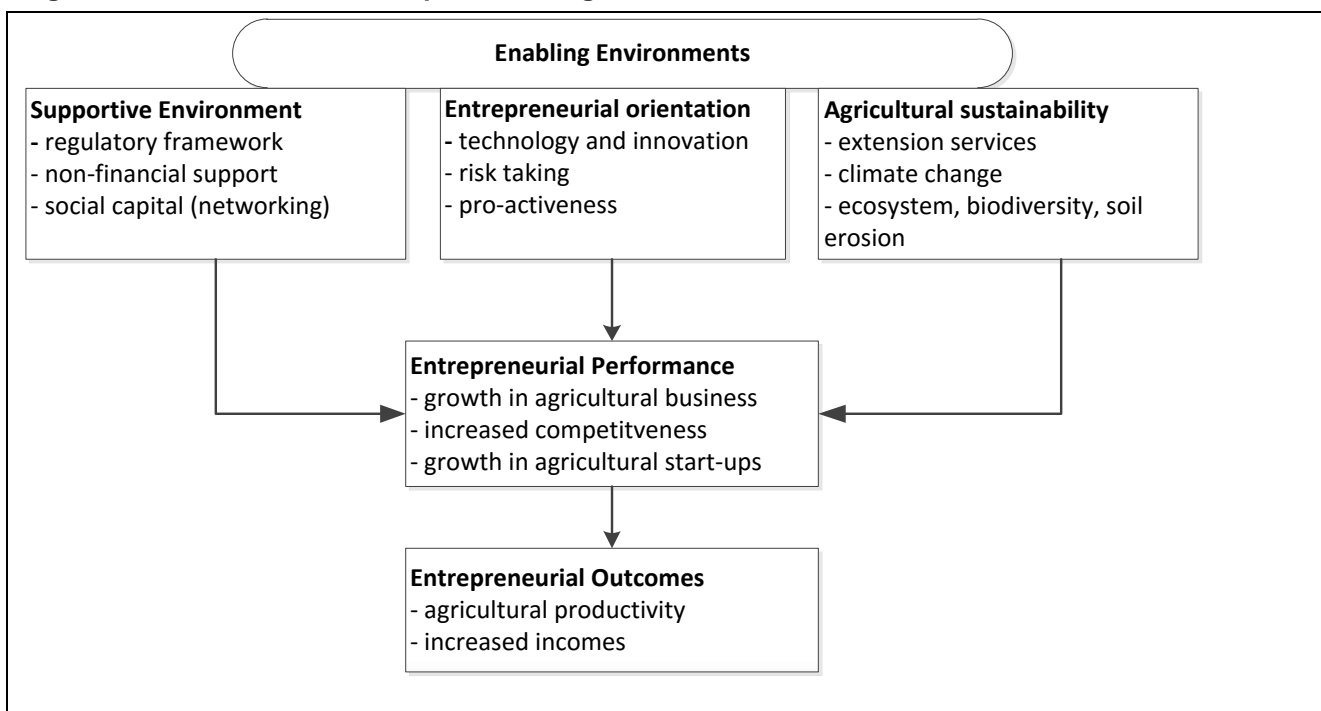
7.3.2 Contribution to policymaking and practice

For the purposes of policy making, the study:

- Provides a tool for the formulation of agriculture- and land reform policies that can lead to improved productivity in the agriculture sector, and increased incomes for farmers. Such a tool is critical in helping avoid what Mboweni (2015:17) refers to as misalignment between land reform and agricultural performance, where the amount of land acquired for resettlement purposes becomes the key performance indicator for achievement with little or no regard for how that land can be utilised productively.

- Confirms that the supportive environment, made up of non-financial support, regulatory framework and social capital (networking), contributes positively to entrepreneurial performance. This implies that policy interventions that creating a supportive environment for enhancing entrepreneurial performance by focusing on improving the regulatory framework, promoting social capital (networking) through platforms for exchange of information and ideas, and encouraging non-financial support by, for instance, creating facilities for incubation and mentoring are implemented. Similarly, Carlsson *et al.* (2013), Gnyawali and Fogel (1994) and Kiggundu (2002) recommend the above factors as being important ingredients of a supportive environment for the enhancement of entrepreneurial performance.

- Establishes that entrepreneurial orientation, as represented by the dimensions of risk-taking, pro-activeness, and technology and innovation, influences entrepreneurial performance positively. Policy interventions that create space for advancement in technology and innovation could go a long way to promoting entrepreneurial performance in the agriculture sector. This could be achieved by setting up technology and innovation hubs where farmers can get exposure to modern farming methods. More resources, both financial and human, should be harnessed towards research and development. In the same vein, a culture of risk-taking and pro-activeness could be encouraged by offering incentives to farmers who venture into new production processes as a way of improving their product offerings, and hence increasing their market share.

- Confirms that agricultural sustainability contributes positively to entrepreneurial performance. In order to ensure that agricultural activities are pursued in a

sustainable manner, policy interventions need to focus on the preservation of the ecosystem and of biodiversity, combating the effects of climate change, and emphasising prevention of soil erosion. This could be achieved through the provision of adequate extension services by equipping agricultural extension officers with requisite skills that enable them to impart farming skills to farmers.

With regard to practitioners, the study:

- Offers a framework for promoting and inculcating a culture of entrepreneurship (entrepreneurially oriented agricultural practices) in beneficiary farmers; thereby enhancing entrepreneurial activities in the agriculture sector in particular, and the economy in general. The AEDM articulates a systematic and holistic approach to creating an enabling environment for entrepreneurial performance in the agriculture sector, by pointing to specific enabling-environment dimensions, and respective sub-dimensions that impact entrepreneurial performance positively.

7.4   LIMITATIONS OF THE STUDY

The following are identified as the limitations of this study:

- The study is cross-sectional, meaning that it is a snapshot assessment of entrepreneurial performance, of its enabling environment, and of entrepreneurial outcomes. Future research could adopt a longitudinal research design to investigate: (i) the positive effect of increased levels of supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies and agricultural sustainability on farmer's entrepreneurial performance; and (ii) the impact of improved levels of entrepreneurial performance on agricultural productivity, increased incomes, and improved livelihoods of the target farmers.

- The study adopted non-probability sampling, specifically purposive sampling. Even though the sampling of respondents was performed by the careful selection of famers to ensure that they represented the population of NRP and AALS farmers as a whole, the generalisation of the study's findings vis-à-vis the entire population, needs to be

taken with caution. The study, for instance, concentrated on merely three out of fourteen regions.

- The study's population was represented by NRP and AALS farmers in the geographical context of Namibia. This sample frame may not be representative of all farmers in developing contexts. Replication of this study among farmers in other developing contexts is recommended, before one can justify the generalisation of such results.

- The selection of the constructs in the conceptual AEDM were based on a systematic review of the literature on agricultural-entrepreneurial development frameworks. However, the use of certain keywords in the literature search may have excluded studies that would have influenced the development of the conceptual framework.

- The study applied PLS-SEM which, besides the advantages that warranted its use over other SEM techniques, is constrained in terms of assessing goodness-of-fit and determination of correlational relationships between latent constructs.

7.5 RECOMMENDATIONS

7.5.1 Recommendations for future research

It is recommended that the following be considered for possible future research:

- As stated above, in order to test the impact of the exogenous constructs (supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies and agricultural sustainability) on entrepreneurial performance, and the influence of entrepreneurial performance on the development of entrepreneurial outcomes (agricultural productivity, increased incomes, and improved livelihoods), at different points in time, future research could adopt a longitudinal approach.

- Future studies could validate the conceptual AEDM in other developing contexts, thus contributing to development of a more universal model.

- Research could consider constructs other than supportive environment, cooperative environment, entrepreneurial orientation, entrepreneurial competencies and

agricultural sustainability that may emerge from further research of frameworks of agricultural-entrepreneurial development.

- In order to enhance the AEDM, further research could be conducted on the relationship between entrepreneurial competencies and entrepreneurial performance, and also between cooperative environment and entrepreneurial performance, as the two constructs are theoretically purported to be crucial for the development of entrepreneurship (Kshetri, 2011; Lans *et al.*, 2014; Morris *et al.*, 2013; Nieuwenhuizen & Nieman, 2014).

7.5.2 Recommendations for future practice

It is recommended that the following be considered for possible future practice in Namibia:

- Government, as the driver of the land reform programme, should adopt this study's final AEDM as a useful guide in the planning and implementation of this programme. The final AEDM lays out the enabling environment for fostering entrepreneurial performance in the agriculture sector.

- It is crucial that the constructs which exhibited positive relationships with entrepreneurial performance, namely, supportive environment, entrepreneurial orientation and agricultural sustainability be incorporated in any pre- and post-settlement support programme that aims at ensuring productive utilisation of the land allocated to beneficiary farmers.

- Secondary schools and tertiary institutions could ensure that their curricula incorporate elements of the final AEDM as a way of equipping potential farmers with the skills required for enhancing entrepreneurial performance in the agriculture sector.

- Government and other stakeholders such as NGOs, farmers unions, the private sector, civil society, famers and financial institutions could contribute towards a fund that can be utilised to implement the final AEDM in the targeted farming community (NRP and AALS) in particular and farmers in general.

7.6   SUMMARY AND CONCLUSIONS

The theoretical part of the study reviewed literature on entrepreneurship and agriculture, including sustainable agriculture, which resulted in the formulation of a theoretical framework for the study, and ultimately conceptual AEDM. The empirical part of the study involved the transformation of the conceptual model into a statistical model and the empirical testing thereof. The findings of the empirical testing of the model as presented indicate that the final AEDM is a useful tool for enhancing entrepreneurial performance in the agriculture sector. However, the relationship between entrepreneurial performance and the exogenous constructs cooperative environment and entrepreneurial competencies, which was statistically non-significant in this study, should be explored further, as these enabling-environment dimensions are commonly recognised as being crucial for entrepreneurship development.

The findings of the study provide a basis for further research in agricultural entrepreneurship. Future research should explore various directional relationships, including those investigated in this study, in order to strengthen and cement the role that entrepreneurial performance can play in agricultural growth, and the resultant socio-economic development.

As regards practice, government, beneficiary farmers, farmers unions, NGOs, financial institutions and civil society in Namibia, should embrace and vigorously implement the final AEDM as a tool for the promotion of entrepreneurial performance in the agriculture sector. The final AEDM should become reference material for successful and productive entrepreneurial oriented agricultural practices in the Namibian context. It is recommended that future research corroborate the results of this study in other development contexts, before making practical use of the final AEDM in those contexts.

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APPENDIX A
RESEARCH QUESTIONNAIRE

MODELLING AN AGRICULTURAL-ENTREPRENEURIAL DEVELOPMENT RESOLUTION

PLEASE NOTE

This questionnaire must only be completed by the following category of persons: farmers benefiting under the National Resettlement Programme (NRP) and Affirmative Action Loan Scheme (AALS).

All information will be treated as **STRICTLY CONFIDENTIAL** and will only be used for academic purposes.

INSTRUCTIONS TO COMPLETE THE QUESTIONNAIRE:

1. Please mark with an X in the block(s) provided after each question which reflect your answer the most accurately.

2. Use a pen of any colour to mark the X in the appropriate block, or type an X next to the appropriate number when completing the questionnaire electronically.

3. Please make sure that all the questions are answered in order to provide comprehensive information that would enable the researcher to make an accurate analysis and interpretation of the data.

SECTION A: ASSESSING THE ENABLING ENVIRONMENT FOR ENTREPRENEURIAL PERFORMANCE

Mark with an X in the block provided after each question to indicate your answer

(please select only one option per question)

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate the extent in which you agree with the following statements which pertain to **supportive environment**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
On **regulatory framework:**					
1. Taxation laws are not a hindrance to farming.					
2. Property laws are easy to understand.					
3. Procedures for registration of business are simple.					
With regard to **access to financial resources**:					
4. Loans for agricultural activities are easy to access.					
5. Government subsidies on loans are helpful.					
6. Credit facilities at commercial banks are available.					
Access to non-financial resources:					
7. The network of roads is good.					
8. There are adequate telephone lines.					
9. Infrastructure for mobile phones is available.					
10. Water is available.					
11. Electricity is available.					
Regarding **culture:**					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
12. Government is actively supportive of entrepreneurial activities in the country.					
13. Society's attitude towards, and perception of entrepreneurs is positive.					
14. Entrepreneurs are recognised and celebrated.					
With respect to **social capital (networking):**					
15. There is regular exchange of information among farmers.					
16. Farming events are organised to showcase products.					
17. Farming events are organised to facilitate skills transfer through sharing experiences.					
18. Interaction among farmers provides a platform to access resources (knowledge and finance).					
Regarding **market conditions:**					
19. Access to foreign markets to sell and buy products is easy.					
20. Access to domestic market to sell and buy products is easy.					
21. Information on domestic and foreign markets opportunities is easy to access.					
With respect to **education and training:**					
22. Lack of general education negatively affects farming operations.					
23. Training with emphasis on entrepreneurship is important to profitable farming.					
24. Vocational agricultural education with a focus on entrepreneurship is useful for future agricultural entrepreneurs.					
On **role models:**					
25. Family members influenced your choice to farm.					
26. Entrepreneurs influence potential entrepreneurs to engage in entrepreneurship.					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
27. Role models through exchange of information support potential entrepreneurs to succeed.					

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate in what way you agree with the following statements which pertain to **entrepreneurial orientation**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
With regard to **risk-taking and pro-activeness:**					
28. Taking risk by venturing into the unknown helps to uncover opportunities in the market.					
29. Pro-active business owners beat competitors by being the first to introduce new products in the market.					
30. Pro-activeness (being the first to act) is encouraged among beginner/emerging farmers.					
31. Risk-taking is encouraged among beginner/emerging farmers.					
On the importance of **technology and innovation:**					
32. Increased use of information technology can improve the knowledge and skills of farmers.					
33. Increased use of information technology can benefit the marketing of agricultural produce.					
34. More emphasis on innovation (new methods) can improve the quality of agricultural products.					

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate the extent in which you agree with the following statements in relation to **entrepreneurial competencies**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
On **entrepreneurial skills**:					
35. Successful farmers are not afraid to take risk to penetrate new markets.					
36. The ability to identify opportunities ahead of competitors is important.					
37. Farming requires a creative mind to resolve problems.					
38. Innovation can play a critical role in improving the quality of farm produce.					
39. Farmers are adequately equipped with entrepreneurial skills.					
With regard to **business skills**:					
40. Financial management is crucial to farming.					
41. Keeping your personnel satisfied can boost their moral and performance.					
42. Good skills in marketing are vital for growth in sales.					
43. Maintaining effective communication with stakeholders (government, educational institutions, agriculture industry experts, suppliers of agricultural inputs, farmers) is important for success.					
44. Access to legal services ensures adherence to laws governing business or farming operations.					
45. A sound business plan facilitates access to financial resources such as loans.					
46. A structure that ensures clear lines of reporting enhances the operations of the business or farm.					
On **mentorship:**					
47. Beginner/emerging farmers learn from experienced farmers through mentorship (understudy).					
48. Mentorship exposes the beginner/emerging farmer to the business community and markets.					
49. Mentorship serves as a source of inspiration and role model.					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
With respect to **technical skills:**					
50. Good knowledge of agriculture and farming techniques is necessary for success (i.e. production of good quality livestock that attract good prices).					
51. Good knowledge of agriculture equipment is important for their maintenance and long-term use.					
52. Good knowledge of agriculture techniques is required for better soil management to avoid the soil losing quality.					
53. Application of appropriate technology leads to improvement in seed, pesticides, fertilizers and vaccines quality.					
Regarding **performance motivation:**					
54. The mere fact that one is striving to achieve set goals is in itself motivating.					
55. Running a successful farming operation is very satisfying.					
56. Organising regular price-giving events to reward good performers in agriculture can motivate farmers to be productive.					

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate in what way you agree with the following statements which pertain to **agricultural sustainability**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
On **agricultural extension services**:					
57. Technical advice on new techniques in farming is provided to famers.					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
58. Regular training in land management is provided to farmers and other stakeholders.					
59. There is timely dissemination of information on animal diseases.					
60. There are well equipped agricultural extension offices in all the regions to provide assistance.					

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
With regard to **ecosystem, biodiversity, soil erosion** (the environment in which we live and farm)**:**					
61. Prevention of land degradation and erosion is vital for agricultural sustainability.					
62. Environmentally sound practices are important.					
63. Preservation of the ecosystem is a prerequisite for sustainable agriculture.					
64. Effective use of people's collective capacities to resolve agricultural problems is the way to go.					
On the implications of **climate change** (for instance – change in weather conditions which affects rain patterns):					
65. Climate change threatens food security because it results in too much rain or too little rain which affects agricultural production.					
66. Lack of knowledge on how to adapt to climate change lead to low food productivity because of poor soil management.					
67. Governments are doing enough to address climate change.					

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On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate in what way you agree with the following statements which pertain to **entrepreneurial performance**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
With respect to **growth in your agricultural business**:					
68. Expansion of agricultural business can be due to application of entrepreneurship in farming.					
69. Entrepreneurial performance is necessary for growth of existing agricultural businesses.					
70. An increase in the number of agricultural businesses is an indication of an expansion of the agricultural business sector.					
71. An increase in sales of agricultural products leads to growth and expansion of agricultural businesses.					
With regard to **agricultural start-ups**:					
72. Entrepreneurial performance encourages agricultural start-ups.					
73. New agricultural businesses will emerge when farmers practice entrepreneurship.					
74. A good environment for entrepreneurship will encourage agricultural start-ups.					
75. Agricultural start-ups are important for growth in agricultural productivity.					
On **competitiveness:**					
76. Entrepreneurial performance lays the ground for competitiveness.					
77. Competitiveness will improve the quality of agricultural products.					
78. Good quality agricultural products will attract good prices on the market.					

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate in what way you agree with the following statements which pertain to **entrepreneurial outcomes**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	**2**	**3**	**4**	**5**
Concerning **agricultural productivity**:					
79. Growth in agricultural businesses leads to agricultural productivity.					
80. Entrepreneurial performance enhances agricultural productivity.					
81. Agricultural productivity ensures food security.					
With regard to **increased incomes**:					
82. Increased productivity leads to increased profits.					
83. Increased quality of agricultural products leads to growth in sales.					
84. Increased incomes result in improved standards of living.					
On **improved livelihoods:**					
85. Entrepreneurial performance impacts livelihoods in a positive way through increased incomes.					
86. Innovation is critical for improved livelihoods through increased productivity and incomes.					
87. Improved livelihoods help alleviate poverty.					

On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree, please indicate in what way you agree with the following statement which pertains to the **role of stakeholders in entrepreneurial performance in agriculture (moderating effect)**:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	1	2	3	4	5
88. Stakeholders (government, farmers, educational institutions, agricultural experts and suppliers) play an active role in encouraging agricultural entrepreneurship.					

Mark with an X in the block provided after each question to indicate your answer (please select only one option per question)		
With regard to **monitoring and evaluation:**		
89. Has there ever been monitoring and evaluation by the relevant authorities with regard to the performance of your farming activities?	Yes (1)	No (2)
90. Did monitoring and evaluation make a difference in entrepreneurial performance?	Yes (1)	No (2)

SECTION B: DEMOGRAPHIC INFORMATION

91. **What is your age?**	…………years

Mark with an X in the block provided after each question to indicate your answer (please select only one option per question)

	Male (1)	Female (2)
92. What gender are you?		

93. What is your highest academic qualification?	
No qualification	(1)
Primary school completed	(2)
High school completed	(3)
Tertiary qualification (certificate, diploma)	(4)
Tertiary qualification (degree)	(5)
Other (please specify)	(6)

94. Indicate your past work experience immediately before farming.	
Unemployed	(1)
Worker (clerk, secretary, driver, domestic worker)	(2)
Self-employed (owned a business)	(3)
Supervisor (first-line management)	(4)
Middle management	(5)
Top management (executive)	(6)
Other (please specify):	(7)

SECTION C: FARMING OPERATIONS INFORMATION

Mark with an X in the block provided after each question to indicate your answer

(please select only one option per question)

95. In which area (region) are you farming?	
Omaheke	(1)
Khomas	(2)
!Karas	(3)
Hardap	(4)
Erongo	(5)
Otjozondjupa	(6)
Kunene	(7)
Kavango East	(8)
Kavango West	(9)
Zambezi	(10)
Oshikoto	(11)
Oshana	(12)
Omusati	(13)
Ohangwena	(14)

96. Under which government support scheme have you been assisted to acquire or access farming land?	
National Resettlement Programme (NRP)	(1)
Affirmative Action Loan Scheme (AALS)	(2)
Self-supported	(3)

Other: (please specify)	(4)

97. What is your main farming activity?	
Livestock	(1)
Grains	(2)
Horticulture	(3)
Mixed farming system	(4)
Other: (please specify)	(5)

98. What is the legal business form of your farming activity (form of business ownership)?	
Sole proprietorship	(1)
Cooperative	(2)
Partnership	(3)
Close corporation	(4)
Private company	(5)
Business trust	(6)
Not registered	(7)
Other: (please specify)	(8)

99. What is the turnover (annual sales) of your farming operation?	
N$50 000 and less	(1)
N$51 000 – N$100 000	(2)
N$101 000 – N$500 000	(3)
N$501 000 – N$1 million	(4)
Above N$1 million	(5)

100. The total number of permanent employees on your farming operation is? (Permanent employees are defined as those working continuously on the farm for one year and more).	

Other comments:

Thank you very much for your valuable time in completing this questionnaire.