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## Article

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## Article

# Agri-Preneurial Resilience and Success: The Correlation and Demographic Characteristics of Smallholders in South Africa

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**Abstract:** The incentives and subsidies needed to stimulate growth, resilience, and success in agri-preneurial businesses will only be realized through numerous interventions as agri-preneurship contributes significantly to sustainable agricultural development in South Africa. This study provided a novel insight into agri-preneurial resilience and success and evidenced the hypothesis that there is no significant positive correlation between agri-preneurial resilience, farm success, and selected demographic characteristics of smallholders. We surveyed a total of 200 agri-preneurs who were willing and able to participate in this study. This study used a structured questionnaire that was divided into the following sections: (i) demographic information; (ii) agri-preneurial resilience; and (iii) agri-preneurial success. Descriptive statistics and a regression analysis were employed to articulate responses. Four distinct models were employed to ascertain the goodness of fitness and the hypothesis, and assess the relationship between success, resilience, and selected demographic characteristics of agri-preneurs. To determine resilience, the Connor–Davidson Resilience Scale (CD-RISC) with 10 items was used because the CD-RISC justifies the best psychometric characteristics that portrays the levels of resilience amongst agri-preneurs. In measuring success, the scale items were graduated and ranked on a 5-point scale from 1 to 5. The reliability of the scale was also tested, and  $\alpha = 0.93$  was obtained. This study obtained a Cronbach alpha value of 0.96, indicating optimum reliability. Additionally, we ran a factor analysis to certify the reliability of the variable, which gave one factor from the four items. Significant positive correlations were found between gender, age, education, income, household size, diversification, and agri-preneurial resilience and success. This study concluded that most of the selected demographic characteristics were predictors of agri-preneurial resilience and success. However, demographic variables may be influenced by numerous factors given the heterogeneity of agri-preneurs in the study area.

**Keywords:** agri-preneurial resilience; success; demographic characteristics; correlation; smallholders; South Africa



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## 1. Introduction

Agriculture as a business in South Africa plays a distinct socio-economic role as a provider of raw materials, foreign exchange earnings, and employment, notably in rural areas. South Africa has moved from the primary sector of production to an economy that is driven by the tertiary sector, culminating in an overall estimate of 69% of the GDP (African Union 2012). However, employment in the agricultural sector, which accounts for about 5.4%, declined from about 2 million in the year 2000 to approximately 885,000 in 2017 (STATS 2017; A.I. Agholor et al. 2023). Engaging in numerous income-generating strategies is paramount to reducing poverty and enhancing the livelihoods of households in South Africa. This report indicates that over half of South African households are categorized as poor, notwithstanding the general decrease in poverty between 2006 and 2011. However,

the poverty level increased in 2015 with a surge in food insecurity amongst households (Acs et al. 2013). According to a general household survey in 2018, farmers engaged in the cultivation of grains were 50.6% and fruits and vegetables 53.3%, while 48.7% and 36.6% were involved in livestock and poultry production, respectively. Furthermore, about 10% of households in farming received agricultural-related support, including farm credits with the highest support provided to Eastern Cape (25.1%) and Northern Cape (17.3%). In addition, 1.3% of households had training by extension personnel in livestock-related services (STATS 2018; Agholor and Kanayo 2021).

Climate-related events manifesting in prolonged drought and high temperature touching almost all parts of South Africa between 2015 and 2017 exacerbated adverse effects on the agricultural sector, especially small farm businesses, led to the declaration of national state of disaster from 13 March to 13 June 2018 to surmount the crisis espoused by climate change. The declaration was intended to mobilize resources to build up intervention measures to deal with the unintended consequences of drought. This phenomenon attracted ZAR six billion allocated to the national budget for the 2018/2019 financial year (Odendaal 2018; I.A. Agholor et al. 2024). South African agriculture remains dualistic in practice, where the commercial agriculture exists with subsistence smallholder farmers who reside in rural areas (Tshuma 2015; Agostini et al. 2020). Apart from drought challenges, land reform was also initiated to help improve agricultural businesses and rural livelihoods since the introduction of democratic government in 1994. The primary objective of land reform was to curtail the injustices that emanated from the successive rule of apartheid government and to assist in reducing poverty (Prosterman and Hanstad 2003; Alstete 2008). The restitution and redistribution thrust of the land reform policy created a category of land reform beneficiaries who attempted to engage in commercial agricultural activities in their respective areas. However, state assistance in the form of machinery and implements were not adequately matched by land beneficiaries' ability and skills in obtaining working capital to complement assistance from government. Land beneficiaries were challenged by tenure restrictions that disallow them from using their asset (land) as collateral for loans. Nevertheless, while land reform initiatives existed for almost two decades to boost rural access to land, agricultural practice remains dominated by smallholder farmers with land reform beneficiaries disgusted by the government failure to render full implementation (Akram-Lodhi 2008). The credit challenges of smallholder farmers in South Africa are worsening with inadequate potential for agripreneurs to access credit exacerbated by insufficient credit channels and collaterals in rural areas (Akgün and Keskin 2014).

According to Strauss (1996), Al Issa (2021), rural bank customers have access to saving facilities other than credit access because of the high transaction cost usually associated with credit transmission account. The areas covered by agricultural finance include financial services such as personal savings, remittances and transfers, insurance, and loans, potentially required for agricultural business and farm subsidiary activities encompassing the purchase of farm input and supply, processing, marketing, and retail. These activities often take place in rural communities, while the large agricultural processing and marketing businesses occur in urban and peri-urban centers (Awotoye and Singh 2017). In contrast to most of Sub-Saharan Africa, South Africa has a productive and functioning commercial farming sector with an expanded agricultural production that includes the cultivation of grains like maize, millet, sorghum, and barley. Additionally, oilseeds, fruits, sugar cane, citrus, numerous vegetables, and wine are commonly produced. The dominant livestock activities include the rearing of beef and dairy cattle, pigs, goats, sheep, as well as poultry products. On average, one fifth of the entire agricultural export value obtained in Sub-Saharan Africa is generated from South Africa (Babu et al. 2014). Government assistance and good use of public funds remain the foundation for both subsistence and commercial agricultural growth in Africa. The investment in rural agriculture, complemented with policies and institutional frameworks remains the driver of enhanced productivity. South African government support for rural agriculture since independence has been overwhelming and is intended to ameliorate poverty. The comprehensive agricultural support program (CASP)

is one of the primary provisions to address the inadequate access for support services, particularly for agripreneurs (Bazan et al. 2020; Phetla 2017).

The prime movers of agriculture in South Africa ranges from research and credits to improved institutions and capital formation. The need for the government's increased investment in agriculture is paramount and will go far in enhancing agricultural growth (Barrett et al. 2001). According to the World Bank indicator, Sub-Saharan Africa's economy is expected to decrease from 4.1% in 2021 to 3.3% in 2022 because of increased risk of debt, drought, and rising inflation exacerbated by the Russian–Ukraine war. This unfortunate trend is exposing food-insecure regions in Sub-Saharan Africa to adverse hardship (Zhang et al. 2022; Barton and Peat 2014). With available data from about 33 countries in Sub-Saharan Africa, 29 had inflation of more than 5% in July 2022, while 17 countries were in double digits with higher borrowing costs. For instance, for Ghana, amidst weakening local currency, the cedi had inflation hitting 33.9% in August 2022 and had sought help from the international monetary fund (IMF) despite a growth forecast of 3.5% for the same year. The World Bank also decreased hitherto; the percentage forecast for Nigeria and South Africa ranging from 3.8% and 2.1% to 3.3% and 1.9%, correspondingly. However, the growth position for Angola, which profited from increased oil prices, was elevated to 3.1% from 2.9 in April 2022, while Ivory Coast was predicted to be the fastest growing economy in West Africa, with 5.7% in expected growth for the year under review (Barton and Peat 2014). The financial constraints of agripreneurs were widely acknowledged in South Africa as an impediment for sustainable agricultural growth, in a country where a large share of the population depends on agriculture. Banks and other financial institutions are reluctant and unwilling to lead to small agripreneurial businesses, citing high failure in repayment and inadequate collateral as the reasons. Besides, access to rural credits by small farm businesses is also limited by the high cost of lending and servicing (Binuomote et al. 2021). The performance of small farm businesses in South Africa is bleak and remains daunting in the face of restricted access to credits. The search for structured credit management strategies and an impact on the national subsidy in a period of the entrepreneurial spirit of small farm business owners to commercialize, underpinned by a survey approach, has been elusive.

## 2. Literature Review

### 2.1. The Growth Path for Agriculture

African government investment towards agricultural development is expected to increase following planned commitments at all levels. Notable commitments are addressed by the comprehensive Africa agriculture development programme (CAADP) and the East African community (EAC)—which focuses on ways of eliminating non-tariff trade barriers (Boyne and Meier 2009). Sub-Saharan Africa is diverse with human and natural resources that could generate inclusive growth and reduce poverty in the area. Sub-Saharan Africa (SSA) is the world's largest free trade area, creating an enviable development path and utilizing the potential for its enormous resources. The area is made up of low, lower-middle, upper middle to high-income countries with 22 countries affected by conflict and 13 states characterized by low population, inadequate skill, human capital, and limited land area (Binswanger-Mkhize 2014). SSA's economic performance was forecast to be at 4% in 2021, an increase from a contraction in performance of 2% in 2020. However, the anticipated growth of 4% in 2021 was up from economic growth of 2% in 2020. SSA economies are expected to grow at 3.9 percent and 4.2 percent in 2023 and 2024, correspondingly. This growth path has significant impact on agricultural productivity since most SSA countries are dependent on agriculture (Binswanger-Mkhize 2009). There are growing symptoms of recession, which is already putting pressures on monetary policy adjustments. Reserve banks are saddled with trade-off between allowing a weak economy that is associated with inflationary outlook and battling inflation to limit possible recession. Meanwhile, many countries in the region are either wallowing in indebtedness with liabilities and debt distress, growing from 52.6% to 60.5%. To cushion the risk of a continued increase in debts and sustenance,

some parts of the region have introduced austerity measures to manage and reduce debt levels. Improving farming is crucial in driving a growth-enhancing change process. Amidst increases in food prices and supply restrictions, occasioned by the Russian–Ukraine war, economic policy makers need to ensure international trade flows and avoid tariffs and taxes increases on exported and imported goods and services. In various SSA regions, commercialization and industrial development are shrinking, and farming is not creating sufficient returns to help in accelerating agricultural commercialization (Campanella et al. 2020). However, the peculiarities of SSA farming that indicate special constraints in terms of good agricultural production include climate vagaries, poor soil fertility and degradation, dominance of rain-fed agriculture, inadequate irrigation, inadequate farm mechanization, diversified farming systems, gender issues and poor market conditions (Chadha and Dutta 2020). These constraints have far-reaching implications for the commercialization of smallholder farming. Nevertheless, agricultural commercialization assists in fostering growth of the market in the agricultural sector. The establishment of farm infrastructures and improved agricultural extension services could influence decisions to commercialize small farm businesses.

Studies (Ogut and Qaim 2019; Urt and Pinho 2010), acknowledged the role of farm credit and infrastructures in encouraging commercialization. Previous growth in the agricultural sector lagged around 3%, which is grossly inadequate for a sustained growth rate of the 6% needed to fast-track agriculture expansion and target for appropriate commercialization, poverty alleviation, and food security (Cooper et al. 2013). However, suitable policy intervention and investments, including resuscitation of infrastructure, technology, an improved market, and an increased share of output will address the inadequacies in SSA's agriculture and induce commercialization as urbanization is happening in the region. Institutional settings required for commercialization of SSA's agriculture show remarkable success, manifesting in the improvement of the private sector, independent civil societies, communities, and sector institutions saddled with the provision of agricultural support. A well-formulated and operational institution can deal with all the elements of rural development, from primary health care and social protection to agriculture. In SSA, government regulations have also impeded food crops commercialization by inter-regional and border restrictions. Local demand for most farm produce, notably the main staples, is inelastic in comparison to price and income shifts. Therefore, an increase in production would reduce domestic prices and profit in the farming sector. Nevertheless, across-the-border exports of crops in SSA that are not in the national food bracket have remained indefinite over time and thus paved way for the commercialization of only crops that are horticultural. The regional market requires nifty and well-designed government policies to eliminate non-tariff obstacles linked to the ineffective management of phytosanitary inspections, transport constraints, and customs challenges. However, the recent government's commitment and initiatives at regional and national scales to invest more in agriculture is gaining momentum. These important commitments encompass the comprehensive African agriculture development Programme (CAADP) and the East African community (EAC)—a regional market encumbered with, among other obligations, the removal of non-tariff trade constraints (Chisasa and Makina 2012).

## 2.2. Credit Access and Rural Finance in South Africa

The majority of South African agripreneurs and households live in informal settlements where poverty is rife. However, the circumstances of small farm businesses with respect to credit support services is worsening (Collier and Dercon 2009). Agriculture remains an important sector to the South African economy, providing about 3% to the GDP, while generating the highest employment potential to the citizenry. Nevertheless, the full prospects of optimum production have not been realized because of the inadequate access to credit facilities required for farm inputs. Undoubtedly, adequate access to credit plays a vital role to farm business success, particularly for poor rural households who



depend entirely on agriculture for sustainable living (Department of Agriculture Forestry and Fisheries 2014; Owusu-Antwi and Antwi 2010).

Presently, households face enormous challenges in accessing credit from formal credit markets mainly because of inadequate information exacerbated by inadequate credit distribution channels and unnecessary bureaucracy. The implausible reasons usually adduced by credit institutions for not lending to agripreneurs are because of the high rate of default, uncertainty, inadequate collateral, the minimal rate of interest on agricultural loan, long-term moratorium, and the associated risk inherent in farm business (Del Giudice et al. 2017). The less resourced agripreneurs often result in group lending as a mechanism to address credit challenges. However, group lending through cooperatives enhances social relations and friendships while enjoying the benefits of pulling resources together for the overall advantage. Nevertheless, removing restrictions in accessing credits can assist households to cushion the effects of shocks and vulnerabilities. The South African credit market, even though robust, presents limitations in the provision of credit in its present form to effectively provide credit to rural farm businesses and poor households due to distorted information. The households continue to be marginalized and pushed farther away from accessing credit. The micro-lenders in South Africa focus only on the formally employed people so that their salaries could be tapped or serve as collateral to ensure repayment of the loans. The loans are advanced at high interest rates. Some started to offer micro loans, which are not secured by property, but by a pledge of the borrower's pension or provident fund. Most poor households do not meet these requirements and do not have collateral or valuable assets to secure credit and are also unable to afford high interest rates.

### 2.3. Agri-Preneurial Businesses

Agri-preneurial businesses in South Africa is mainly dominated by small landholders and operated at a relatively small scale. There are many views and perceptions on whether these smallholders' agricultural practices could be transformed into commercial farms. However, debate on the plausibility of commercialization models of agri-preneur businesses and its relative advantages and disadvantages has been stirred by some economists, detailing smallholder farm business as the engine for poverty alleviation (Ranieri and Ramos 2013; Demirgüç-Kunt et al. 2022). The higher food prices exacerbated by climate change have increased fears and doubts for the impending growth and commercialization of smallholder farm businesses in Africa (De Putter et al. 2007). Nevertheless, investment in agriculture is driven by numerous factors, including the desire to face competition for land and subsidies. The incentives and subsidies needed to stimulate growth in small-scale farm businesses will be realized through numerous interventions, from bank assistance to market development and technology (Dina 2006; Eshel et al. 2019). Moreover, Ferraris et al. (2017), asserted that there are three scenarios that can boost agri-preneurial commercialization and transformation in Africa. These scenarios include the following: development in sciences and technology, the creation of regional markets to provide subsidies, and good governance that will assist in emphasizing long-term agrarian reform. Agriculture commercialization involves changes from small scale farm business to a broader market-oriented system that includes increasing growth units of output, value addition, and preparation for both domestic and foreign markets. The commercialization of farm business is motivated by economic growth and relative success in agricultural production (Fisher et al. 2016; Foxall and Yani-de-Soriano 2005). Agripreneurs are disposed to commercialization only when there are known potential benefits associated with commercialization and behavioral adoption decision (Guiomar et al. 2018).

Furthermore, the enormous transaction cost, together with fluctuation in prices in agricultural markets, affects subsidies and incentives for agripreneurs (Gabriele et al. 2020). The strategies that can assist in alleviating numerous unfavorable transitional effects include support and investment in farm infrastructure, crop breeding, research, extension services, secured land rights and capital market liberalization (Gama and Isaac 2022). Additionally, investment in water resources, particularly irrigation schemes, is

considered as a paramount and key determinant for an increase in food security and improved livelihoods for rural development (Sharma 2006; Hayward 2013). Adequate agricultural finances enhance commercialization, which means more than the sales of farm output but encompasses product choice and farm input use and the decisions based on the ideology of profit intensification. Agricultural markets play a distinctive role in the commercialization of farm businesses and assist in reducing the cost of exchanging agricultural products. An appropriate agricultural marketing system not only reduces the cost of transactions but assures the stability of food supply in ways that benefit agripreneurs, agricultural marketers, and consumers (Hebard and Lamberson 2017; Internal Labour Organization 2017). However, the major constraints inherent in agricultural markets in African agriculture comprise inadequate infrastructure, insufficient support services, the increasing cost of transaction, price volatility, and weak institutional subsidy. According to a study conducted in Tanzania, the vegetable supply chain had a higher margin between the price paid to agripreneurs with small land holdings than the one paid to consumers. Agripreneurs with small land holdings are inundated with inadequate physical infrastructures such as storage facilities, transport, market information, and access cascading the increased cost of operations (Wale and Chipfupa 2021; Johri et al. 2024). In contemporary Africa, market failure reminiscence in the high cost of transactions are widespread, culminating in trapping the rural farming households in abject poverty. The government policy position demonstrates that market failure can be addressed by ensuring adequate input subsidy, but the cost of subsidy may limit the availability of funds for public investment in transport, markets, and research that will stimulate sustained growth in farm business.

#### 2.4. Agri-Preneurial Resilience

Relative to agriculture, entrepreneurship is simply denoted as agri-preneurship consistent with the application of conformist entrepreneurship principles and practices in agriculture (Juma 2011). Agri-preneurship has various connotations, and for this study, it is defined as an agricultural business that employs the factors of production for effective utilization. Nevertheless, actors in agri-preneurship are agripreneurs who operate in a plausible and dynamic environment, while still floundering with threatened and numerous subjective challenges (Tejada and Punzalan 2012). In this circumstance, farmers generally decide to adapt and embrace strategies while agripreneurs result to modification of behavior to address these challenges (Kazukauskas et al. 2014; Kaufmann and Shams 2015). In our contemporary societies, numerous farms and businesses face a catalog of challenges, and discontinuities occasioned by instability within the ambit of operations (Khalilov and Yi 2021), thus facing an erratic future that is branded by uncertainties. Antecedently, it is proposed that resilient organizations can manage uncertainties by tolerating and adjusting to environmental vagaries (Sabatino 2016).

In theory, the term 'resilience' has been considered as the capability of an organization, (in this scenario agripreneurs) to resist adverse conditions (Lengnick-Hall et al. 2011). Resilience connotes an ability that allows agripreneurs to take the appropriate action in response to unforeseen and unanticipated occurrences that may potentially endanger their continued survival (Kimhi et al. 2020). Resilient agripreneurs embrace rather than rebuff changes and take risks to achieve predetermined goals. At a personal level, resilience indicates how an individual adapts to a change in a role or project; it illustrates how an individual recovers from a mistake or a failure; or how a person pursues a personal goal notwithstanding the obstacles. The attributes of resilient agripreneurs literally give them the strength and agility for success. Consistent with other definitions, define resilience as the enduring ability of agripreneurs to recover quickly from shocks and adverse events and continues to remain relevant in farm business.

#### 2.5. Agri-Preneurial Success

According to (I.A. Agholor et al. 2024), agri-preneurship is considered an activity encompassing the coordination of all farm operations, within the value chain. Agri-

preneurship undertaken has shown remarkable relevance in today's pecuniary literature, primarily due to the contemporary economic woes experienced by most countries in recent times. It is the desire of an agri-preneur to find and imbibe good business ideas and redesign a proactive business model that will improve their farming business for success (Zhai et al. 2019; Chadha and Dutta 2020). This innate desire to obtain and meet targets illustrates, in part, the meaning of success for some agri-preneurs. The term success is subjective and may not carry a universally accepted definition (McMichael 2009). Nevertheless, it is through ascribing values and using measurement metrics that success can be analyzed, but consequently, one level of quantitative techniques applied in measuring success will be flawed. However, the prerequisite for this study is to obtain operational measures of farm success. Agri-preneurs apply farm financial performance as a unilateral metric for success, but numerous studies (Lusch et al. 2016; Morris et al. 2005; and Mulaudzi et al. 2023) have linked farm success to other variables, such as the level of goal attainment achieved by an agri-preneur and second, the amount of money earned from investment (Nunnally 1978; Ofunoye 2017). In this context, an agri-preneur who has attained a predetermined goal may be seen as successful, while others who have received sufficient money from farm investment could also be said to be successful. Others use farm-level metrics like growth rate (size), survival rate (existing), and remaining in farm business to provide a satisfactory measure of success. A unique problem for applying survival rate alone is that not all agri-preneurs who remain in business can be regarded as successful. A new surviving farm may decide to reduce in size over time by selling assets in anticipation of failure, while older agri-preneurs may decide to reduce in size by disposing assets not because of failure but in anticipation of retirement. Conversely, a reduction in farm size for younger agri-preneurs may imply that the owner failed to earn enough profit to meet overhead and loan repayment and had to dispose of assets to remain in business. On the other hand, an increase in farm size may denote that the owner realized sufficient farm income and, therefore, is assured of profit (Kazukauskas et al. 2014). Thus, for numerous surviving farms, the rate of growth provides a useful index about success. However, the weakness of focusing on growth only is that a growth rate analysis or interpretation is limited to a known population. While a growth rate analysis may identify the factors that hinder growth, it cannot convincingly identify the determinants of agri-preneurial survival, which is necessary for success.

Additionally, several studies (Ofunoye 2017; Ogujiuba et al. 2022) used a simple dichotomous variable model for the illustration of farm success, neglecting to recognize that success can be seen partially and could be measured on a continuum. Lastly, most of these studies did not examine household collective action around farm success or how household behavior affects resilience and farm success. Against this backdrop, this study attempts to close these gaps and provide novel insights into farm success and resilience. This study, therefore, hypothesized as follows: (i) There is no significant positive correlation between agri-preneurial resilience and selected demographic characteristics. (ii) There is no significant positive correlation between farm success and selected demographic characteristics.

### 3. Materials and Methods

#### 3.1. Study Area

This survey was conducted in the Ehlanzeni district, Mbombela Local Municipality, South Africa. Ehlanzeni include four main local municipalities: Nkomazi Local Municipality, Mbombela Local Municipality, Thaba Chewu Local Municipality and Bushbuckridge Local Municipality. Amongst the communities, six were selected for the survey, which include Kayamazane, Mpakeni, Kabokweni, Jerusalem, Malekutu, and Mahushu. Mbombela has intermediate biome zones of grassland and savannah. The area is associated with mild winters and summer rainfalls with subtropical climate, which favors farm business. The zone records an average rainfall of 300–500 mm annually with a total surface area of 5394 km<sup>2</sup> and is geographically positioned in 25°25'30", 30°55'0". With a population of approximately 588,794, which is dominated by 89.4% black South Africans, the minority



racial groups include Afrikaans (0.9%), whites (8.7%), and Indians (0.7%). The languages spoken in the area include Swati (78.7%), Afrikaans (6.8%), English (4.6%), Tsonga (4.1%), and the other languages were 5.8% (Mulaudzi et al. 2023). This area was considered for this study because it is dominated by agripreneurs.

### 3.2. The Approach

The hypothesis includes the following: (i) Are there significant positive correlations between selected demographic characteristics and agripreneurial resilience? (ii) Are there significant positive correlations between selected agripreneurial resilience traits and farm success? Therefore, the direction for this study is to obtain an accurate and operational measure of (i) agripreneurial success and the correlation with selected demographic characteristics of agripreneurs and (ii) the selected demographic characteristics and correlation with agripreneurial resilience. This study adopted a quantitative research procedure. The sample size considered for this study was calculated using Slovin's formula, which allowed us to estimate the number of respondents required to guarantee realistic accuracy of the results with appropriate precision (Tejad 2012). According to (Alstete 2008) for reasons of factor analysis, a minimum of 100 respondents may be allowed in any survey. The sample size initially considered for this study was 285 respondents, but this number could not be reached because of the scattered settlement pattern of agripreneurs.

We therefore surveyed a total of 200 farmers who were willing and able to participate in this study. In preparation for the data collection, 5 trained enumerators were assigned to 20 farmers for a pretest survey of the questionnaire item to ensure content validity. All respondents who participated in this study were either practicing agripreneurs at a large or small scale. This study used the structured questionnaire divided into sections: (i) demographic information; (ii) agripreneurial resilience; and (iii) agripreneurial success.

In the data analysis, descriptive statistics and a regression analysis were employed to articulate responses. The version 28 of the Statistical Package for Social Sciences (SPSS) software was used for data analysis. In compliance with ethical issues, all participants in this study were pre-informed about the objectives of this study, confidentiality assurance, anonymity, and voluntary participation. However, the variables employed in this study were measured and congruent with the objective of agripreneurial resilience. Studies showed that different scales are employed to determine the levels of resilience of individuals (Wall et al. 2004; Parida et al. 2016; Fatoki 2018). In this study, the Connor–Davidson Resilience Scale (CD-RISC) with 10 items, was used because the CD-RISC justifies the best psychometric characteristics that portray the levels of agripreneur resilience. The scale items were graduated and ranked on a 5-point scale from 1 to 5. Where 1 = “does not describe me at all” to “describe me very well”. A similar study (Patel et al. 2019; Pingali et al. 2019) also employed the same scale, and subsequently, this study obtained a Cronbach alpha value of 0.96, indicating optimum reliability. Additionally, we ran the factor analysis to certify the reliability of the variable, which gave one factor from the four items. The four items were the following: I vigorously explore ways to restore the losses I encounter in life; I trust that I can develop in positive ways by dealing with complicated situations; I hunt for innovative ways to change difficult situations; and irrespective of what happens to me, I trust I can control my response to it. Thereafter, a composite measure of agripreneurial resilience was calculated by finding the average of each score. In the analysis, the four items were used as dependent variables, while the agripreneurial success variables were used as independent variables.

In measuring agripreneurial success, a five-point Likert scale that ranged from 1—strongly agreed to 5—strongly disagree was used. The items are the following: (i) “I consider myself successful if I am personally satisfied with my life and farm business”; (ii) “I surpass my farm business goals that I set out to achieve”; (iii) “my farm business grows constantly”, and (iv) “my farm business grows in the returns on investment”. These four items were averaged to give the mean score for agripreneurial success (Shaul et al. 2024; Pettit et al. 2019). The reliability of the scale was also tested, and  $\alpha = 0.93$  was obtained.

In determining whether there is a significant positive correlation between demographic characteristics of agripreneurs and agripreneurial resilience, 7 variables were considered (Table 1): age, gender, education, farm income, household size, diversification, and farm size. The age variable is continuous and considered independent: 20–30 years = 1; 31–40 years = 2. In that order, we assessed ‘resilience and success’ as dependent variables. To determine the relationship between age and resilience, an exploratory bivariate analysis was used. Gender and diversification as a dichotomous variable were assessed as: 0 = male; and 1 = female. Correspondingly, those who diversify take a value of 1 and 2 otherwise. The ordinal variable farm size was assessed in acres as:  $\leq 5$  acres = 1; 6–10 acres = 2; 11–15 acres = 3; and  $\geq 15$  = 4. Farm income considered as a continuous variable was assessed by 1 item with a five-point response scale ranging from 1 = very much above average to 5 = very much below average. The level of education as a discrete variable was also assessed on a five-point scale ranging from 1 = no school to 5 = tertiary school. For reasons of clarity, this study used the Maximum Likelihood Estimates and assessed a saturated model, owing to the difficulty in finding similar studies that supported a complementary model. However, it is pertinent to state that when applying a saturated model, it is not relevant to examine a model fitting summary, but it is provided in our analysis.

**Table 1.** Variables and items used in this study.

Variables	Type	Description
Agri-preneurial resilience	Dependent variable	I vigorously look for ways to replace the losses I encounter in life.
		I trust that I can develop in positive ways by dealing with complicated situations.
		I hunt for innovative ways to change difficult situations.
		Irrespective of what happens to me, I trust I can control my response to it.
Agri-preneurial success	Dependent variable	I consider myself successful if I am personally satisfied with my life and farm business.
		I surpass my farm business goals that I set out to achieve.
		I consider myself successful if my farm business grows constantly.
		I consider myself successful if my farm business grows in the returns on investment.

## 4. Results and Discussion

### 4.1. Descriptive Statistics

In sum, 200 agripreneurs participated in this study. The results as indicated in Table 2 show that the gender and age of respondents were 1.54 and 2.06, respectively. The average level of education and household size were 3.05 and 1.69, while the farm income and type of farming practice (diversification) were recorded as 4.20 and 1.00, respectively. The farm size and farming experience of respondents averaged 2.74 and 2.03, correspondingly. Accordingly, Table 3 illustrates the factor analysis (FA), depicting the Cronbach alpha of 0.843 and 0.868 for agri-preneur resilience and agri-preneur success respectively.

**Table 2.** Descriptive statistics.

	N	Sum	Mean	Std. Deviation	
	Statistics (200)	Statistic	Statistic	Std. Error	Statistic
Gender	200	308	1.54	0.035	0.500
Age	200	411	2.06	0.065	0.914
Education	196	598	3.05	0.065	0.916
Income Farm income	200	841	4.20	0.239	3.379
Household size	200	338	1.69	0.036	0.515
Diversification	200	200	1.00	0.000	0.000
Farm size	200	548	2.74	0.097	1.368
Farm experience	200	403	2.03	0.079	1.112

**Table 3.** Factor analysis.

Variables	Items	Kaiser–Meyer–Olkin (KMO)	p-Value Bartlett’s Test	Cronbach’s Alpha
Agri-preneur resilience	4	0.801	0.055	0.843
Agri-preneur success	4	0.821	0.006	0.868

#### 4.2. Logistic Regression Analysis

Table 4 depicts four distinct models employed to ascertain the goodness of fit, test the hypothesis, and assess the relationship between success, resilience, and selected demographic characteristics of respondents. Model 1 recorded an R<sup>2</sup> of 0.025, adjusted R<sup>2</sup> = −0.016, with an F-change value = 0.605 and Sig. F change = 0.773. In model 2, the R<sup>2</sup> and adjusted R<sup>2</sup> were 0.025 and −0.011 with an F-change value of 0.010 and Sig. F-change value of 0.920. The model summary for model 3 had an R<sup>2</sup> of 0.025, adjusted R<sup>2</sup> = −0.006, an F-change value = 0.103 and Sig. F-change value = of 0.749. Finally, model 4 also recorded R<sup>2</sup> 0.024, adjusted R<sup>2</sup> = −0.002, F-change = 0.131, and Sig. F-change = value = 0.718.

**Table 4.** Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.159	0.025	−0.016	0.503	0.025	0.605	8	187	0.773
2	0.159	0.025	−0.011	0.502	0.000	0.010	1	187	0.920
3	0.157	0.025	−0.006	0.501	−0.001	0.103	1	188	0.749
4	0.155	0.024	−0.002	0.500	−0.001	0.131	1	189	0.718

Table 5 illustrates the Variance Inflation Factor (VIF), which measures the degree of correlation amid one predictor and the others in a model. It is appropriate in diagnosing collinearity. High values indicate that it is impossible to assess correctly the influence of predictors in a model (Barton and Peat 2014). Previous studies (Vatcheva et al. 2016; Young and Casey 2019) have suggested that a VIF over four with a tolerance below 0.25 signifies that collinearity exists, therefore requiring further examination of the model. However, Table 5 indicates our VIF for model 1 = 1.051–1.070; model 2 = 1.047–1.050; model 3 = 1.037–1.357; and model 4 = 1.037, with a tolerance level above the threshold, indicating that collinearity was absent in this study (Foxall and Yani-de-Soriano 2005).

Table 5. Collinearity statistics.

		Correlations	Collinearity Statistics			
		Zero-Order	Partial	Part	Tolerance	VIF
1	(Constant)					
	Gender	−0.055	−0.079	−0.079	0.952	1.051
	Age	0.056	0.104	0.103	0.589	1.698
	Education	0.005	0.097	0.097	0.495	2.020
	Farm Income	−0.027	−0.026	−0.026	0.903	1.107
	Household size (HHSIZE)	0.043	0.071	0.070	0.933	1.072
	Diversification	−0.005	0.007	0.007	0.899	1.112
	Farm size (Ha)	0.006	0.022	0.022	0.934	1.070
2	(Constant)					
	Gender	−0.055	−0.079	−0.078	0.955	1.047
	Age	0.056	0.104	0.103	0.596	1.677
	Education	0.005	0.098	0.098	0.499	2.005
	Farm Income	−0.027	−0.027	−0.027	0.910	1.099
	Household size (HHSIZE)	0.043	0.071	0.071	0.933	1.071
	Diversification	−0.059	−0.075	−0.020	−0.019	−0.011
	Farm size (Ha)	0.006	0.023	0.023	0.953	1.050
3	(Constant)					
	Gender	−0.055	−0.077	−0.076	0.964	1.037
	Age	0.056	0.105	0.104	0.597	1.674
	Education	0.005	0.098	0.097	0.499	2.005
	Farm Income	−0.027	−0.026	−0.026	0.910	1.098
	Household size (HHSIZE)	0.043	0.071	0.070	0.934	1.071
	Diversification	−0.068	−0.105	−0.104	0.732	1.367
	Farm size	−0.051	−0.073	−0.018	−0.011	1.27
4	(Constant)					
	Gender	−0.055	−0.077	−0.076	0.964	1.037
	Age	0.056	0.102	0.101	0.613	1.631
	Education	0.005	0.099	0.098	0.499	2.003
	Farm Income					
	Household Size (HHSIZE)	0.043	0.070	0.069	0.935	1.069
	Diversification	−0.068	−0.112	−0.111	0.761	1.314
	Farm size	−0.057	−0.071	−0.012	−0.010	−0.027

#### 4.3. Correlation Matrix

Table 6 depicts the correlation matrix from the factor analysis. In running the factor analysis, first, we generated the correlation matrix for all variables to allow for removals based on the correlation coefficients of the variables (Table 4). Furthermore, the factors were rotated to maximize the relationship between the variables and some of the factors. The factor analysis assisted in grouping variables with similar characteristics together (Parke and Cookston 2019; Tinsley and Tinsley 1987). A detailed assessment of correlation matrix was conducted through Kaiser–Meyer–Olkin (KMO), which measures the strength of the

variable relationship and gave an acceptable level of KMO of 0.801 and 0.821, implying that the FA was satisfactory.

**Table 6.** Correlation matrix.

	Const.	Gender	Age	Educ	Farm Incom.	HHSIZE	HHInco.	Farm Type	Farm Size	Exper	Agri-Resil.	Agri-Succ.
Const.	1.000	−0.282	−0.309	−0.452	−0.013	−0.254	−0.007	−0.048	−0.051	−0.243	−0.333	−0.625
Gender	−0.282	1.000	−0.049	−0.036	−0.015	−0.128	0.118	−0.032	−0.073	0.023	0.103	0.076
Age	−0.309	−0.049	1.000	0.432	−0.155	0.099	−0.115	0.088	−0.018	−0.222	−0.047	−0.005
Educ	−0.452	−0.036	0.432	1.000	0.024	0.102	−0.483	−0.055	−0.011	0.330	0.010	0.137
Income.	−0.013	−0.015	−0.155	0.024	1.000	−0.019	−0.198	0.105	−0.027	−0.003	0.076	−0.055
HHSIZE	−0.254	−0.128	0.099	0.102	−0.019	1.000	−0.097	−0.021	0.034	−0.159	0.045	−0.027
HHInco	−0.007	0.118	−0.115	−0.483	−0.198	−0.097	1.000	−0.098	−0.098	−0.199	−0.072	−0.041
Diversification	−0.048	−0.032	0.088	−0.055	0.105	−0.021	−0.098	1.000	−0.143	0.082	0.146	−0.157
Farm size	−0.051	−0.073	−0.018	−0.011	−0.027	0.034	−0.098	−0.143	1.000	−0.215	−0.062	−0.034
Exper	−0.243	0.023	−0.222	0.330	−0.003	−0.159	−0.199	0.082	−0.215	1.000	0.121	0.184
Agri-resil	−0.333	0.103	−0.047	0.010	0.076	0.045	−0.072	0.146	−0.062	0.121	1.000	−0.042
Agri-succ	−0.625	0.076	−0.005	0.137	−0.055	−0.027	−0.041	−0.157	−0.034	0.184	−0.042	1.000

#### 4.4. Correlation of Selected Demographic Variables and Agri-Preneurial Resilience and Success

The chosen method adopted to test our hypothesis and explore the relationship amongst variables were appropriate as reported in the model summary (Table 4). The findings revealed that agri-preneurial resilience is significant and positively influences agri-preneurial success (Table 7). This result is consistent with previous studies (Awotoye and Singh 2017; Fisher et al. 2016; Hayward 2013), who found a positive relationship between measures of resilience (endurance, creativity, and hopefulness) and success in practice and growth. In this analysis, gender was linked with resilience in model 1 and 2 and with coefficients of 0.020 and 0.040, respectively. This result is consistent with the findings of Shaul et al. (2024) who underpinned the female role as having a higher resilience coping strategy than the male role. Meanwhile, age and education also predicted farm success with a coefficient 0.012 and 0.003 for model 3 and 4, respectively. The age of respondents impacted on the level of resilience in models 1 (0.042), 3 (0.013), and 4 (0.020), while the education of respondents recorded a significant relationship (0.016) only on model 4. However, farm characteristics are fundamentally linked to resilience and success and affected by farming routines. Also, there is an overlap in the traits that encourage resilience and farm success. The alignment and interaction between agri-preneur and farming practice are critical in building resilience and success while recognizing the trade-offs that exist between success and resilience. The traits underlying the income may likely determine the level of agri-preneurs resilience and success. Agrarianizing prospects would enhance productivity, may define alleviation interventions, and ultimately contribute to resilience and success. Agri-preneurs with diverse circumstances would be affected differently because of inadequate income, which has been the main area that attracted debates—agri-preneurial investment in South African agriculture. In addition, food security, poverty alleviation and rural wealth creation, and environmental sustainability may also be inhibited because of inadequate access to income.

Income in the analysis depicted a positive relationship (model 1 = −0.004; model 2 = −0.004; model 3 = −0.004; and model 4 = 0.069) between resilience and success in all models except for model 4 (Table 7). Appropriately, agri-preneurs engaging in wide relationships and larger family size with several stakeholders, such as customers and suppliers, can add value and become resilient, which enhances success (Ferraris et al. 2017; Parida et al. 2016). The household size category exhibited non-linear relationships but accounted for success in model 3 and 4. Mutual and collaborative associations of agri-preneurs with others may assist in offering a substantial pathway to capital, which ultimately improves



farming practices and competencies that can buffer resilience, cascading to agri-preneurial success (Kaufmann and Shams 2015; Lusch et al. 2016).

**Table 7.** Correlation of selected demographic variables and agri-preneurial resilience.

Variable	Agri-Preneurial Resilience			
	Model 1	Model 2	Model 3	Model 4
<b>Agri-pre</b>	0.002	0.050	0.844	0.049
<b>Agri-succ</b>	0.442	0.061	0.005	0.578
<b>Gender</b>	−0.020	−0.040	−0.078	−0.078
<b>Age</b>	0.042	0.072	0.013	0.020
<b>Education</b>	0.075	0.075	0.075	0.016
<b>Farm Income</b>	−0.004	−0.004	−0.004	0.069
<b>HHSIZE</b>	0.070	0.070	0.039	−0.085
<b>Diversification</b>	0.002	0.009	0.002	0.003
<b>Farm size (Ha)</b>	0.008	0.006	0.010	0.005

In our analysis, we examined the pertinent role of diversification for agri-preneurs to enhance their resilience and seeming success. Precisely, researchers rarely investigate how agri-preneurs can leverage diversification in farming to acquire competence and to stimulate agri-preneurial opportunities (Acs et al. 2013), let alone how diversification could foster resilient agri-preneurs. Nevertheless, our data confirms that agri-preneurs who engage in diversification can build resilience and enhance agri-preneurial success. As indicated on Table 7 and model 1–4, the variable diversification was significant with coefficients of 0.002, 0.009, 0.002, and 0.003, respectively. Consistent with other studies, (Barrett et al. 2001; Winters et al. 2010; and Wuepper et al. 2018) posited that investors or agri-preneurs engaging in diversification acquired social capital, asset ownership, and off-farm opportunities. The reported coefficient for farm size was positive and similar in all models for resilience (Table 7), while in the success category, all models except for model 2 were positive (Table 8). Like a study conducted by Guimar et al. (2018), smaller size farms also contribute to food security both at national and local levels, despite their decline in numbers.

**Table 8.** Correlation of selected demographic variables and agri-preneurial success.

Variable	Agri-Preneurial Success			
	Model 1	Model 2	Model 3	Model 4
<b>Gender</b>	−0.080	−0.080	−0.078	−0.078
<b>Age</b>	0.073	0.012	0.003	0.070
<b>Education</b>	0.015	0.051	0.075	0.076
<b>Income</b>	−0.004	−0.004	−0.004	0.069
<b>HHSIZE</b>	0.070	0.070	0.072	−0.085
<b>Diversification</b>	0.002	0.009	0.011	0.007
<b>Farm size (Ha)</b>	0.008	0.092	0.044	0.006

## 5. Conclusions

This study focused on agri-preneurial resilience and success as mediating the correlation and demographic characteristics of agri-preneurs in South Africa. Farm income also influences economic outcome; that is, whether an agri-preneur experienced success also depended on the size of their operation. The coefficients for farm income proved

significant, suggesting that a larger farm income may be responsive to immediate changes in the success outlook of farms. To conclude, agri-preneurial diversification decreases the risk of economic loss, while resilience and success appears greater with diversification. The findings explicitly indicated that some selected demographic characteristics in this study impacted agri-preneurial resilience and success. From hypothetical underpinning, this study used four different models to articulate the parameters of resilience and success as correlational with demographic characteristics of agri-preneurs. This study made an important contribution to the body of literature by addressing the impact of diversification related to agri-preneurial resilience and success.

The undertakings and pursuit of agri-preneurship are often encumbered with stress, challenges and high levels of doubt about outcomes and results. Agri-preneurship resilience is an important feature that may assist in driving farm success. However, restrictions abound and agri-preneurial success, resilience, and associated findings appear daunting and inconclusive. Understanding the success and resilience factors may impact the failure rate. Findings of this study can assist agri-preneurs and small farm business enterprises to develop plans to enhance resilience through farmer education and seminars. Additionally, the findings of this study will assist the government and other agencies to be acquitted on how resilience can affect success.

#### *Limitation and Future Research*

The direction for this study is to obtain an accurate and operational measure of (i) agri-preneurial success and the correlation with demographic characteristics of farmers, and (ii) the demographic characteristics and correlation with agri-preneurial resilience. This study essentially made an important contribution to knowledge and literature, primarily focusing partly on selected demographic characteristics, agri-preneurial resilience and success, about which information and knowledge is very restricted. This study employed only quantitative techniques for relatively large samples of agri-preneurs, and this may have influenced the outcome of this study. Further, our investigation is correlational and does not permit causative inferences. Considering this understanding, caution must be observed in the interpretation of the results. The seeming dearth of research work on agri-preneurial resilience and success in agricultural practices in the study area further illustrates the rationale for this study. Nevertheless, further research is required to validate results in another socio-economic context.

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