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FACTORS ASSOCIATED WITH LAND ACQUISITION FOR FOOD PRODUCTION AMONG SMALL-SCALE FARMERS IN SOUTH AFRICA

By

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A Full-thesis submitted in fulfilment of the requirements for the Degree of MPhil Population Studies, Department of Statistics and Population Studies, Faculty of Natural Sciences, University of the Western Cape, South Africa.

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Acronyms

ANC : African National Congress

DBSA : Development Bank of Southern Africa

DUs : Dwelling Units

FSPs : Farmer Support Programmes

GHS : General Household Survey

HHHs : Household heads

ISR : Inverse Sampling Rate

JFPM : Johannesburg Fresh Produce Market

MAFISA : Micro Agricultural Financial Institutional Scheme of South Africa

MALA : Ministry of Agriculture and Land Affairs

OHS :October Household Survey

PSUs : Primary Sampling Units

SPSS : Statistical Package for the Social Sciences

StatsSA : Statistics South Africa

SLA : Sustainable Livelihoods Approach

DECLARATION

I, Faith Sabelo Mbamba hereby declare that "Factors associated with land acquisition among small-scale farmers in South Africa" is my own work, that it has not been submitted for any degree or examination in any academic institution, and that all the sources I have used or quoted have been indicated and acknowledged by complete reference.

Faith Sabelo Mbamba November 2021

Signed…… Date……...

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DEDICATION

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Abstract

The purpose of this study is to investigate determinants of land tenure, agricultural activities involvement, and the use of agricultural products and stock keeping among small-scale farmers across all nine provinces of South Africa. Little is known regarding tenure status that households typically use to access land across nine provinces of South Africa. The characteristics of household heads in small-scale farming still under-researched; and socio-demographic characteristics for household subsistence still scanty in the literature. GHS between 2015 and 2018 from StatsSA was employed.

GHS questionnaire was used to sample households. Stratified design used for primary sampling units (PSUs), but dwelling units (DUs) were sampled using systematic sampling. For data analysis, SPSS version 27 was used, performed univariate analysis, cross-tabulation, and chi-square to test relationship. Logistic regression used to explore leading factors for tenure security. This study establishes that small-scale farming is almost the foremost livelihood option for the rural lives of South Africa.

The findings of the study established that within the context of South Africa there are female headed households involved in agricultural activities. Accessing land by the landless poor people was discovered as a foremost challenge which resulted in food insecurity and poverty in rural dwellings. Land is accessed through tribal authority by household heads to practice small-scale farming in it. Under tribal authority, land is generally allocated to men, most of rural women as a result do not have access to land rights of their own. The study findings found that farm products produced by female headed households are used as the main source of food for household consumption. Given the fact that a number of them are poor, they found themselves to be less excluded from land acquisition. The study discovered further that, age, employment, household headship, and level of education are the leading contributing factors to acquire land across nine South African provinces.

Keywords: Subsistence farming, land, food production, non-metropolitan areas, household heads.

CHAPTER 1: INTRODUCTION

1.1. Background of the study

The aim of this study is to investigate the factors determining land tenure status, agricultural activities involvement, the use of the agricultural products and stock keeping for food production among small-scale farmers across nine provinces of South Africa. Throughout history, land has been recognized as a primary source of wealth, social status, and power (Nyirasafari, 2009). It is the basis for shelter, food, and economic activities, hence, the most significant provider of employment opportunities in rural areas (Cox & Magel, 2002). This study maintains that land is the resource which those who reside in non-metropolitan areas (interchangeably used with rural areas in this study) have much of it but rather were dispossessed of it, and hitherto struggle to acquire it back due to enormous constraints that exist within the sphere of land issue, more so, which in turn they could utilize it for food production for subsistence and generate income to meet basic needs and combat poverty.

The reliance upon access to land among small-scale farmers dates back to the pre-historic time when people were hunters and survived on animals for food. These animals needed a lot of land space for their survival. Hence, as the population increased, people began to cultivate land to support or augment the means of livelihoods of their families. Over the years, different systems have been developed to supply the population with land. These systems and policies of land allocation have evolved over time and differ from country to country. However, the basic objective still remains the same i.e., satisfying a growing population with enough space for food production and shelter (Erickson, 1999).

In developing countries, rural households are mostly food insecure. That deprives them a chance to meet their daily nutritional food needs (Averbeke and Khosa, 2007). Reily et al., (1999); Bonti-Ankomah (2001) emphasise that in order to achieve food security, households should have enough land to produce food by themselves and have adequate physical access to food supplies, markets, or other sources, and that those food supplies be properly employed to reach the specific dietary needs of individuals.

In Sub-Saharan Africa, access to land for farming is a tool that curbs unemployment, promoting social welfare in the process as well as the political stability (Delgado, 1998; Abdu-Raheem and Worth, 2011). Moreover, small-scale food production plays a major role in reducing rural poverty and food insecurity (Lele and Agarwal, 1989).

In South Africa, most agricultural households (approximately 2.7 million) are engaged in small-scale subsistence farming. Therefore, having land opens a platform for farming, as agriculture plays a vital role in the economic sector, which secularly creates employment opportunities, food security, reducing poverty and contributing to the country's Gross Domestic Product (GDP) (Quantec, 2013). Moreover, when comparisons are made with other sectors, agriculture contributes 2.5% of the total GDP (Mayowa, 2015). Regardless of the population so rapidly growing and projected to reach 95 million by the year 2050, the South African government hence has to focus on food production for food security (Chisasa, 2015). Notwithstanding its slight contribution to the total GDP in rural areas, small-scale farming remains significantly as a contributing factor to employment, especially in rural areas (Mayowa, 2015).

Land is a central issue in the transformation that South Africa is going through. It is regarded as an important asset for household subsistence, as enormous number of households especially in rural areas rely heavily on land for food production and consumption (Nyirasafari, 2009). Analysis of crop and livestock production data suggests that in many of the small-scale farming households, the majority of them are using the land they have to produce different crops and livestock products for home consumption and sale (Chitonge, 2013).

In addition, Aliber et al., (2006) examined the magnitude and scope to which land is demanded in the following three provinces in South Africa: Limpopo, Eastern Cape, and Free State. Nonetheless, the findings from the study indicate that 48% of black people in these three provinces want land, while one-third wants it for food production. Then, 29% of the land demanded was from the farm dwellers while 37% demand was from communal areas. Interestingly, the study maintains that 45% of those who want land prefer one hectare or less, while a quarter will be comfortable with one to five hectares, and 48% of the land demand is from 18 to 34 years old.

Statistically, about 70% of rural small-scale farmers' households carry out some form of farming activity, and 2.7% of them rely only on farming as a source of income (Edition et al., 2000). According to Aliber et al., (2006), over 3 million households were involved in farming in 2011 and by 2013, this number dropped to 2.6 million, which makes sense because given the nature and extent to which the land tenancy is taking forms in South Africa, people get discouraged, which is precisely the theme of this study - to unpack the determinants and cover

demographic features thereof have an interplay as far as the land acquisition for agriculture is concerned.

Since 2009, the ANC has put more emphasis on supporting small-scale farming to increase productivity, incomes, and household food security (New Agriculturalist, 2013). The National Development Plan has proposed integration of smallholders into existing commercial value chains as a key objective in rural areas. Climate-smart agriculture is also being encouraged as a way to improve productivity, make yields more resilient to climate change and increase carbon storage on farmland. The ANC is also directing resources to smallholder farmer support programmes, extension services and market access support.

New Agriculturalist (2013) stresses that a historic lack of investment, limited resources, poor infrastructure, and a lack of skills for subsistence farming in rural areas are just some of the hurdles that the agricultural sector has to overcome in order to be a catalyst for job creation and development. The trend of job losses in agriculture has been halted, with a reported rise of 87,000 jobs between the second quarter of 2011 and the fourth quarter of 2012. The country had also become a net importer of food, but this has also been reversed and now deals with supermarkets to help smallholder farmers become prosperous. The entrepreneurs have been struck and the government has made a number of agreements with several countries in the region to boost regional agricultural trade (New agriculturalist, 2013).

The African National Congress (ANC) introduced a land reform measure in 1994, dubbed 'willing seller, willing buyer', but only a small amount of land has been transferred. The government originally aimed to redistribute 30 per cent of land by 1999 but shifted this target to 2014: to date only 8 per cent has been redistributed and the target date has been put forward to 2025 (New Agriculturalist, 2013).

Knowing all these efforts South African government has put in place to help poor households for subsistence farming, yet little is known about the tenure status households are more likely to use to access land across nine provinces of South Africa. Moreover, the characteristics of household heads who are involved in agricultural activities still under-researched. The use of agricultural product as main source of livelihood strategy is still unknown in the existing body of knowledge. The information on socio-demographic characteristics of household heads who practice the crop planting for household subsistence is still scanty in the literature. This study on land acquisition for farming in South Africa will try to bridge this gap in the literature, and

to inform the policy makers for future planning in terms of land acquisition for agricultural subsistence among small-scale farmers in South Africa.

1.2. Research questions

This study on land acquisition and land use for farming will focus on the following research questions:

- What is the tenure status small-scale farmers households are more likely to use to acquire land?
- Does the gender of the head of household of small-scale farmers differ in terms of involvement in the agricultural activities?
- Does the agricultural product and stock keeping differ by socio-demographics of small-scale farmers in South Africa?
- Is there a relationship between land tenure, agricultural involvement, and socio-demographics of small-scale farmers in South Africa?

1.3. Problem statement

The issue of land acquisition drew so much attention of numerous researchers and scholars. Moreover, a lot of scholars covered the land issue from a feminist perspective rather than focusing on both men and women to capture any disparities that may exist in relation to land access for food production within the context of South Africa. The increasing population density has already encouraged more intensive use of land for food security in South Africa, yet little is known about the tenure status that households are more likely to use to access land across nine provinces of South Africa. Moreover, the characteristics of household heads who are involved in agricultural activities are still under-researched. The use of agricultural product as the main source of livelihood strategy among small-scale farmers is still unknown. The literature on agricultural activities taking place on the land for food production in conjunction with household such characteristics as age, gender, marital status, level of education, province, and geographical type, remain unknown in the context of South Africa. Hence, this study on land acquisition for food production in South Africa will shade light on these shortcomings.

1.4. The purpose and objectives of the study

1.4.1. General objective

The overall objective of this study is to investigate factors influencing land tenure, agricultural activities involvement, and the use of agricultural activities and stock keeping among small-scale farmers across all nine provinces of South Africa.

1.4.2. Specific objectives

- To ascertain if there has been an increase in the agricultural activities' involvement from 2015 to 2018, and the main tenure status used to acquire land across the nine provinces of South Africa.
- To identify the demographic characteristics of household heads who are more involved in the agricultural activities.
- To measure the relationship between socio-demographic characteristics (age, gender, marital status, level of education, province to name a few) of household heads and agricultural related assistance.
- To identify the factors related to land tenure, agricultural activities small-scale farmers are involved in, and the use of agricultural products.

1.5. Hypotheses to be tested

The hypotheses were developed by linking variables of interest in this study. These hypotheses become essential to determine the relationship between land tenure and the demographic, socio-economic characteristics of the household heads who access land in non-metropolitan areas.

- The number of small-scale farmers households involved in agricultural activities has increased from 2015 to 2018.
- The household involvement in the agricultural activities differ by demographic characteristics such as age, gender, marital status, level of education, province, and geographic type.
- Age, gender, marital status, income, level of education, province, and geographic type are the factors contributing to land tenure among small-scale farmers in South Africa.

- The use of agricultural products and stock keeping among small-scale farmers is influenced by socio-demographic characteristics such as age, gender, marital status, income, level of education, province, geographic type.

1.6. Significance of the study

This study identifies the factors that contribute to land tenure, the agricultural involvement, and the use of agricultural products among small-scale farmers in South Africa. Furthermore, the study contributes to the existing body of knowledge by linking the land tenure, the agricultural involvement, and the main use of agricultural products with demographic characteristics of small-scale farmers such as age, gender, education level, population group, marital status, province, employment status and income. This study may serve as a guide for formulating new policies about the land tenure and use agriculture for livelihood in rural areas of South Africa.

1.7. Definition of major terms

Land: Sauti (2018) defines it as the earth's exterior part that is not everlastingly enclosed by water. It is utilized for various purposes, such as economic activities. For instance, mining, manufacturing, and agriculture and social activities. An example could be recreation and housing. Acquisition to land reinforces development of the economy and social inclusion.

Land tenure: Land tenure is the legitimately or customarily defined guidelines developed by societies to control people's affiliations, primarily in relationship to land ownership and its use, and to how it will be transferred and succeeded (La Croix, 2002). Wickeri (2011) affirms that "*Land is Life and Land is Power*."

Agriculture/farming: The Oxford English Dictionary (1971) defines agriculture very broadly as "*The science and art of cultivating the soil, including the allied pursuits of gathering in the crops and rearing livestock.* In this study, we too use the term in its broadest, all-encompassing sense.

Smallholder subsistence agriculture: is defined as the production, which encompasses predominantly households producing on relatively small plots of land less than one hectare, with limited resources only for household survival or sale (Wenhold et al., 2007, Mashamaite,2014).

Non-metropolitan areas: Within the South African context, a non-metropolitan area encompasses areas which are partitioned in a few local municipalities. South Africa has about 231 of local municipalities overall, as stated by Jordan (2006) and Nsengiyumva (2013).

Household: A group of individuals who are living with one another and provide themselves together with food and/or other basics for living, or a single individual who stays alone (Nsengiyumva, 2013; Statistics South Africa, 2001).

Household head: Someone who is recognized by the household. As such, this is typically the key decision-maker, or the person who possesses or leases the dwelling, or someone who is the sole provider.

South Africa: South Africa is a country sub-divided into nine provinces: Eastern Cape, Free State, Gauteng, Kwazulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West, and the Western Cape.

1.8. Organization of the thesis

The research is divided into five chapters. Chapter 1 deals with the introduction: background of the study, the statement of the problem, rationale of the study, objectives, and hypothesis. Chapter 2 presents the literature review. Chapter 3 deals with the methodology to be used. Chapter 4 presents the findings and data analysis. Chapter 5 discusses the findings critically and lastly, Chapter 6 presents the conclusion and recommendation.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The main aim of this chapter is to review the theoretical framework and existing literature regarding land acquisition for food production on small-scale agriculture. This will be subdivided into two sections: theoretical and empirical literature. The section on theoretical literature will review the sustainable livelihood framework theory (SLF) in relation to land acquisition for household subsistence. The empirical literature section will offer discussions and debates on the existing body of research to land access for food production.

2.2. Theoretical literature

The Sustainable Livelihood Framework (SLF) is a theory that motivates this study on household heads' land access for food production. This framework reveals the livelihood strategies that are deemed as beneficial for this study on household heads (HHHs) and land acquisition. Moreover, just before the formulation of the conceptual framework, it is of significance to consider the noticeable contentions pertaining to SLF as discussed in the literature. Some of its critiques are identified and, in that way, it can then be seen as to whether it successfully addresses the central issues to livelihoods on improving standards of living to rural lives.

2.2.1. Sustainable livelihood framework

According to Ellis (1998) Household Strategies and Rural Livelihood Diversification is the portfolio that consists of strategies on being a survivalist and income-generation by families and people in rural settlements of developing countries. Moreover, the portfolio constructed by rural livelihoods alternatively comprises activities that in turn shall enhance their standards of living and social support skills to survive. Diversification is more or less of a paradigm linked with the deplorable toil for survival in diminishing economies and may be linked with accomplishment at reaching livelihood security under improving economic condition as well as livelihood distress in deteriorating conditions (Ellis, 1998; Scoones, 1998; Ellis, 1999).

Livelihood diversification is a fundamental strategy which commonly takes place on different levels of the economy, which are typically, but not always directly linked (Start, 2001). It may be deliberated as key strategy for surviving or risk management for farm households (Ellis, 1998; Ellis, 2008; Geremew et al., 2017;). Some also define farm household diversification as

income approaches of rural people or households in which they acquire and develop their number of activities, notwithstanding of the location or sector (Geremew et al., 2017).

Ellis and Freeman (2005) cited in Maja and Oluwatayo (2018) highlighted that instead of endorsing specialisation in surviving portfolios, reconstruction and upgrading of them for income boosting would be more sensible and applicable to reduce poverty. Ellis (2008) indicates that an increase in non-farm wage rates, or better prospects onto undertaking remunerative off-farm self-employment would intensify the motivation to diversify. Hence, taking advantage of these off-farm opportunities might present a way out of poverty for the rural poor households (Nxumalo, 2016).

According to the work of Saturnino and Borras, it is acknowledged that "*Only peasant and family farm agriculture feed people, while agribusiness grows export crops and agrofuels to feed cars instead of human beings…Industrial agriculture warms the planet, and peasant agriculture cools the planet . . .*" (Saturnino and Borras, 2009). Likewise, this study is on household headship's access to land for food production to survive. The household is used as the unit of analysis. To add, it is very much detailed that women-headed households tend to be more vulnerable compared to their male counterparts. Within the South African context, many households are headed by women, meaning that responsibilities in families fall on their shoulders (Ellis, 1998). However, with women owning up to the responsibility to provide for their families, the constraints on them in relation to accessing land remain and they have too few resources to do so. Even though women are acknowledged as farmers, their hold on land is not solid in the logic that their 'right to make agreements for access to land, to transfer or to be in possession of it and to use land for entrepreneurial targets is marginal' (Mokgope, 2000).

Income encompasses cash earnings of the household, inclusive of payments in a form that can be rated at market prices. The cash earnings component of income includes products form agricultural activities such as crop or livestock sales, and supplementary to remunerations, rents, and remittances. Therefore, income component signifies the consumption of agricultural products from subsistence farming, payments in kind (for example, in food), and transfers or exchanges of those agricultural products that occur between households in rural communities, in that fashion income is generated from the stock-keeping agricultural products and selling them. A livelihood incorporates income, together in cash and in kind, along with the social institutions (kin, family, compound, village and so on), gender relations, and property rights required to upkeep and to put up with a given standard of living (Ellis, 1998; Mokgope, 2000).

Land is a natural resource which makes it indispensable and does not have a substitute. Furthermore, possibly will engender wealth and welfare of people through intensification of farming (gaining more livelihoods from agriculture). Livelihood diversification may also consist of indulging in a variety of off-farm undertakings, may provide farmers with the financial security that would steer massive on-farm innovation. Nonetheless, it is essentially reliant on whether the households diversified out of agriculture due to lack of opportunities for on-farm innovation or whether they are exploiting a particularly high demand for their labour off-farm (Baiphethi and Jacobs, 2009).

Land acquisition remains a component of contestation because it establishes a foremost basis of social relations where it impacts access to land by people and communities owing to issues around competition. In addition to household heads' accessibility to land, there is no sufficient literature that places much emphasis on them, given that to diversify, there should be access to resources, and land in this case to allows for flexibility of economic freedom and reduction of poverty in rural areas.

According to the work of Bryceson (2000; 2002) cited in Baiphethi (2009), South Africa was among the countries that are undergoing de-agriculture and the preeminent causation seemingly was due to constraints that exist on land acquisition (specifically to South Africa). In a Sub-Saharan context, African rural dwellers hold highly and are persistent in pursuing agricultural activities (Bryceson, 2000) where in South Africa, according to Nxumalo (2016), the land acquired is utilized for business targets and in turn shall be used to generate income. On the farm, they concentrate on crop production and rearing of livestock i.e., cows and sheep which they in turn are bought and sold to those who might need them. That way, an extra source of income is generated.

Hence, subsistence farming of food remains the most important element of livelihoods in sub-Saharan Africa. However, the usage of better-quality input packages is declining since operational input packages have not yet been established, particularly for the waterless parts of the region. In addition, the input packages that exist for the higher rainfall areas need to be augmented with enlargement of intermediate and suitable technology to enrich returns to labour (Baiphethi and Jacobs, 2009).

A scope and variety of motives and stresses of diversification are enlightening as to why diversification takes place and the forms of diversity that are observed are well-explained in literature. Some leading causes of diversification are seasonality, distinguished labor markets,

risk management strategies, coping behaviors, credits market imperfections, inter-temporal savings, and investment strategies (Ellis, 1998). Once more, diversification could be linked to broadening imbalances of incomes in social groups of the rural poor and the financially well-off. Because the financially well-off can diversify in more profitable labour markets than those who are financially disadvantaged, in-kind replicates asset poverty predominantly in relation to human capital (Ellis, 1998). Some types of diversification consequently could resort to unproductivity on the subsistence farming. This normally befalls when there are strong distant labour markets for male labour, ensuing in running down of the labour force needed to take on topmost farm production demands such as land preparation and harvesting (Munhenga, 2014).

2.2.1.1. Livelihood approach and food security

According to the work of Mokgope, the sustainable livelihoods approach predominantly has been applied in cases such as elimination of poverty missions to pinpoint and explore distinctive root causes and indicators of poverty, and the association among diverse aspects of poverty (Mokgope, 2000). Land deprivation has left so many people in poverty, and some indulge in activities that do not appeal to them in any way but just to make sure their families are fed, being the wage earners that they are.

The Department for International Development (DFID) is one of the organizations which utilized sustainable livelihoods framework for poverty eradication with the aim to identify and understand preeminent causes in relation to poverty devoid of disintegrating the emphasis onto a number of components such as economic issues or food security (Mokgope, 2000). Almond and Ortmann (2005) in their paper on small-scale farmers and their access to markets report that as long as land constraints exist hitherto have left a majority in poverty cycles, and food insecurity.

Sustainable rural livelihoods approach is all-inclusive of factors that improve the standards of living to rural lives. Mokgope also reported that it considers that livelihoods involve various factors as alluded, which are inclusive of the setting in which people live, their access to livelihood resources, and their participation onto utilizing these resources, the practices that form and regulate the public's access to resources, alongside competence to usage of the resources to make a living (Mokgope, 2000). The essence of things lies with land acquisitions' flexibilities to ensure the good standards of living to rural lives, land reform policy has endeavoured to deal with the constraints of variety to land access, seemingly they still are very vivid intensively.

2.2.1.2. Institutional Framework

The concept 'institutional frameworks' refers to social structures and progressions through which sustainable livelihoods are reached (Mokgope, 2000). Institutions here can be broadly defined as 'regularised practices (or patterns of behaviour) regulated by societal rules and norms which have persistent and widespread use' (Scoones, 1998). There is a necessity to delve into institutions as they have an impact regarding accessibility to resources as Mokgope also states that the predominant natural resource that rural areas are rich in is the land (Mokgope, 2000). Exploring institutions comes in handy for purposes of identification and understanding of the constraints and opportunities to sustainable livelihoods and the social relations underlying livelihood sustainability (Scoones, 1998).

A livelihood is sustainable when it can cope with and recover from pressures and maintain its resources and assets, without weakening the natural resource base. Sustainability will be contingent heavily on the access to these resources, which are joined in the pursuit of diverse livelihood strategies (Scoones 1998). Therefore, livelihood resources, livelihood strategies and institutional frameworks which control acquisition to, and regulation more than livelihood resources are all prominent regarding sustainability of livelihood. The essence to livelihood strategies lies with sustainability also and, should be approached in terms of four key components namely economic, institutional, social, and environmental. They are also vital and there must be a balance among them (Mokgope, 2000).

2.2.2. Some identified critiques in the SLF

Livelihood diversification is a dynamic social process of individual or household diversification, concerning the sustenance and incessant adaptation of a vastly diverse portfolio of activities over time to secure survival and improve standards of living (Ellis, 2008; Loison, 2015). The livelihoods approach was a response to openly practical and technocratic approaches to rural development, which put much emphasis onto enhancing the effectiveness and productivity of agricultural activities in developing countries (Levine, 2014).

Moreover, even though they managed to breed technical advice, their unpolitical viewpoint, and their lack of focus on people meant that they did not exactly examine why individuals made the choices they did and what constraints several individuals might encounter in attempting to come up with 'remedies'. This is because literature has demonstrated that there are land constraints that deprive the household heads to access land and there is insufficient information addressing that and remedies put into place seemingly may not be doing justice hitherto.

A livelihoods approach has at its centre a concern with wanting to understand 'how numerous individuals in different places reside' (Scoones, 2009) cited in Loison (2015), and how and why people make the choices that they do. This discards the notion that society's welfare can be understood founded merely on a simple technical or financial scrutiny of the sectors in which individuals make their living, or that this would be an adequate foundation to develop policy or interventions to support them.

A livelihoods approach attempts to hold two perspectives that have sometimes been viewed as opposites. On the one hand, it is essentially an actor-oriented perspective, seeing people as active agents who make their own choices and devise their own strategies. It has also essentially become what is now often called a 'political economy analyses, because it looks at how people's possibilities and choices are shaped by the broader structures of society in which they live – politics, power, institutions, culture, and so forth. The need to hold two radically different perspectives at the same time does not make good livelihoods analysis easy (Levine, 2014).

Rural livelihoods depend much on natural resource base to a certain degree. According to Conway (1985) a natural resource base sustainability means the competency of a system to sustain productivity when is subjected to agitating forces, whether a 'stress' (a minor, fixed, knowable disturbance with a huge effect) or a 'shock' (a huge uncommon, unknowable disturbance with proximate impact) (Scoones, 1997). This implies avoiding depleting stocks of natural resources to a level which results in an effectively permanent decline in the rate at which the natural resource base yields useful products or services for livelihoods.

However, from the above viewpoint, measurement of natural resource sustainability is extremely difficult, given that it is important to link indicators of resource depletion or accumulation (e.g., soil fertility intensities, vegetation cover and so on) to both the temporal dynamics of system resilience (i.e., the ability to recover from disturbance) and livelihood needs (i.e. an evaluation of whether natural resource change results in 'effectively permanent declines in useful products or services').

Having reviewed the literature on sustainable livelihood framework, it appears that nothing much has been documented pertaining to household heads' acquiring land for subsistence production, given the fact that their access to land could reduce poverty and that through agricultural intensification could generate food security and some income simultaneously. That plays a significant role in sustainable livelihood. Moreover, the framework overlooked the main agricultural activities households are involved in for subsistence. The use of agricultural

products and stock keeping in relation to the household's characteristics was not mentioned. The use of agricultural products and stock keeping in small-scale farming was omitted. This study on land acquisition for food production will bridge this gap.

2.3. Empirical literature on land acquisition

2.3.1. Definition of land acquisition

Land tenure is thus defined as the terms and conditions in which the land is handled, utilized, and transacted. Moor & Nieuwoudt (1995) further expand and define it as a system that denotes to customary or lawful rights by which ownership of the land may be regulated and controlled principally in relation to land use. The land tenure system for that reason comprises a package of rights which guard both the responsibilities and prerogatives of the holder i.e., what to do and what not to do with the land. It is quite crystal then that one may have tenure or a right to the land but may not have taken possession of it (Thwala ,2010).

2.3.2. The history of land dispossession in South Africa

Before 1994, in South Africa, 87% of the land was owned by whites and only 13% owned by black population. This issue of land access goes back to more than a century, to the 1913 Natives Land Act, which provided legislative form to a process of dispossession that had been under way since colonial times (South African government, 2021). The 1913 Natives Land Act saw thousands of black families forcibly removed from their land by the apartheid government. The Act restricted black people from buying or occupying land. This marked the beginning of such socio-economic challenges South Africa is facing today as landlessness, poverty, and inequality. The Land Act was finally repealed when the Abolition of Racially Based Land Measures Act, 1991 (Act No. 108 of 1991) came into force on 30 June 1991. By 2012, post-apartheid land reform had transferred 7.95 million hectares into black ownership (Nkwinti, 2012), which is equivalent, at best, to 7.5% of formerly white-owned land. Whites still own most of the country's land and rectifying racial imbalances in land ownership is land reform's most urgent priority (Institute for poverty, Land and Agrarian Studies, 2013).

2.3.2.1. The impact of 1913 Native Land Act

In both rural and urban areas of South Africa, the effect of the 1913 Native Land Act still is noticeable given the difficulties that mostly those in rural areas are facing regarding the construction of livelihood strategies. Land is a resource that non-metropolitan areas are rich with, and an entity they could utilize to work in their favour to produce in it. It is disputed that

the socio-economic disparities and landlessness to majority of black South Africans was caused by colonial and apartheid land deprivations and exploitation of black Africans (Modise and Mtshiselwa, 2008; Nxumalo, 2016).

As mentioned earlier regarding the land reservations and Bantustans given as an example, still the land deprivation regulation led to native people getting forcefully moved to overcrowded Bantustans. Therefore, Ntsebeza (2007) argues that regardless of the increasing land size for African occupation, according to Land Laws of 1936, there was a long-lasting shortage of land in these reserves. Thus, the native people were slowly transformed from once-effective sharecroppers prior to the discovery of minerals, specifically gold amid 1880s, to wage earners (Ntsebeza, 2007). People started to do things they never had done in their entire lives, to work for a wage, for food and for a place to live (Nxumalo, 2016).

Rural-urban migration also became an issue, as population in urban areas radically increased and the land fell short to put up with all the people who migrated to urban areas. In turn, there was an upsurge in housing demand. On the quest to destabilize apartheid statutes and acquire land, several civic organizations implemented strategies such as land invasions, boycotts against rentals, service charges and bonds. Hence community strains regarding housing were central to wider struggle alongside apartheid were strategies in the non-governability campaign aimed at overthrowing apartheid (Olufemi (2004) cited in Nxumalo, 2016).

Additionally, legislature such as Black Communities Development Act and the Group Areas Act was forcefully cast-off to control the residents from the location and land capacity positioned apart for black South Africans (Nxumalo, 2016). Also, in harmony, Cousins (2000) argues that colonialism and apartheid regime regulations to land tenure rights should take the blame for these noticeable tragic and disastrous outcomes such as non-ending poverty cycles as some still remain landless, specifically blacks.

2.4. Land acquisition in a gendered perspective

According to Mudau, women generally have to shoulder a heavier work burden than men and they work longer hours engaged in tasks like weeding and harvesting. Women also have less access to land, are inclined to be more dependent on their husbands, and earn a lower personal income. These findings point to an urgent need for the greater involvement of women in the relevant issues (Mudau, 2010).

Despite their labour, women are generally excluded from decision-making and control due to their own and others' perceptions of their role as assistants to male farmers. Women tend to benefit less than would be expected, which can be attributed to social and institutional arrangements in terms of land tenure, credit and training that were established in the past. Even cropping patterns have historically been gender oriented (Van Koppen, 1998), and women have regularly found themselves being subdued by male participants when it comes to the allocation of irrigation water.

According to the work of Mokgope, customary practices always have favoured males over females whenever it comes to land acquisition. Moreover, Land is apportioned to men, who are assumed to be heads of their households. On the other hand, women who are heads of households are not allocated land. Inheritance practices deny women (such as daughters and widows) the right to inherit land. In most cases the eldest male child inherits the family property. And also in some societies, the youngest son inherits everything that the family owns and takes all the belongings of the parents, should it happen that they pass away (Mokgope, 2000).

This remains the case to the contemporary era where women still remain a minority denied tenure rights by customary laws, which means a step back in achieving women empowerment, status of women, and or their economic wellness. Moreover, the study done by Blom quite complemented Mokgope's study as it reported on how ancient customs deprived women their right to land ownership. Traditional leaders significantly contributed to depriving women tenure rights based on customary laws and patriarchal demands (Blom, 2006). This needs no debate that even to post-modern era societies or communities usually a house with a male as the household head is more respected and preferred. The study done by Holden and Hailu (2001) did report that.

2.5. Constraints facing small-scale farmers.

Smallholder farmers encounter several constraints, which in turn increases risk and insecurities and pose as hindrances for intensified production, thus stopping them from accessing agrarian markets. This section briefly takes on certain general constraints encountered by small-scale farmers. According to Baloyi (2010) small-scale farmers indulged in traditional form of agriculture have got capabilities of improving themselves economically, but only if constraints they are faced with are eliminated.

Land is an indispensable factor which according to Baloyi (2010) small-scale farmers in developing countries come across massive challenges such as poor land acquisition; poor on-farm and off-farm infrastructures; lack of human capital or funding to carry out agricultural activities; poor technological resources, transportation logistics, research support services; and limited access to high-value markets. Below are constraints encountered by small-scale farmers, as divulged from an international scope:

2.5.1. Human capital scarcity

World Bank (2002) cited in Baloyi (2010), complemented the work of Ortmann and King (2007) and Von Loper et al., (2016) which altogether found a negative relationship between small-scale farmers and education. Small-scale farmers turn out to be often uneducated, with poor technological expertise, which pose critical obstacles in gaining access to suitable formal institutions that offer technological information (Baloyi, 2010). Many evolving producers are poorly equipped with financial and trading skills, which in turn disqualifies them from meeting the quality standards set by fresh-produce markets and food processors (Baloyi, 2010; Beinabe et al., 2004). If a farmer is not well-equipped with knowledge as much as production is concerned, this undoubtedly leads to agricultural products that are of lower quality.

2.5.2. Production constraints

Studies always prioritize land over everything whenever it comes to production, supplementary labour force, and human capital. Thus, should it happen that those resources are not possessed, in turn it impacts harshly on rural farmers and disable them from benefitting in agricultural markets, and predominantly to the bulk of products traded and their quality (Baloyi, 2010; Bienabe et al., 2004). Rather, small-scale farmers out of the three mentioned resources namely land, labour force, and capital, the most prevalent should be the land, before one could think of capital, there is need to have acquired the land first. Unfortunately, there seems to be more intense constraints to land acquisition more than other production factors or resources.

2.5.3. Expensive transaction costs

It is very evident that high transaction costs hinder commercialization. Studies have shown that most of the small-scale farmers are from rural areas, which happens to be geographically diffused and distant from money-spinning markets. Therefore, distance to the market, alongside poor infrastructure and scarcity of resources, and lack of knowledge in turn steers business costs to upsurge. The study done by Ortmann and King (2007) reports that

accessibility to high-value markets remains a challenge for farmers in non-metropolitan areas, and that infrastructure investment should be considered to condense such forms of transactional costs. The recommended remedy by Ortmann and King was that the government should dive in to help and where possible offer start-up funding also (Ortmann & King, 2007).

2.5.6. Lack of on-farm infrastructure

In harmony to the work of Baloyi, small-scale farmers have lack of access to on-farm infrastructure, which includes (storerooms and cold-rooms to store products) which must be kept in good condition right from the onset after harvest. Inaccessibility to stock-keeping inclusive of post-harvest, storage and processing resources establishes an impediment for rural farmers to venture onto agricultural markets, given that buyers are more concerned with food safety and its quality. Being in possession of stock-keeping resources upsurges the probabilities of farmers' to marketing their harvested products, as well as their transactional power (Baloyi, 2010).

2.5.7. Knowledge gaps and markets

On the study that linked smallholders to markets, Beinabe and others reported that small-scale farmers possess limited knowledge regarding to market demands, which is too pricey to attain. Rural farmers are poorly informed when it comes to product prices at the local level, about quality of food required, suitable places and times to trade their products, and about consumers (Beinabe et al., 2004). In consequence, their agricultural products fail to be traded effectively, because as this study is across nine provinces of South Africa which each of them is rich in producing certain products, whatever one would farm should be what many farmers are producing, which could in turn makes one more competitive and be favoured by the market values.

2.5.8. Low quantity and poor quality

According to Baloyi (2010) poor access to land, water, and other production factors results in several small-scale farmers ending up producing low quantities of agricultural products with poor quality. In consequence, that makes them uncompetitive in production markets. Unless this constraint is dealt with and eliminated, given the intensification of food production, more especially agriculture which keeps on consistently contributing to the economy positively to the degree of international scope, to go along with consumption demands and food safety, it

makes it almost impossible for small-scale farmers to access such high-value markets until the low quantity and low quality so evident on their production inputs be dealt with.

2.5.9. Market deficiency in rural areas

According to study conducted by Magingxa, cycles of poverty keep on occurring due to lack of markets for small-scale farmers in the rural areas (Magingxa et al., 2009). The question was raised from the work of Timmer (1997) cited in Baloyi (2010) pertaining to farmers and markets primarily in relation to how rural governing structures tackle the issue of deficient and weakly operative markets. Evidently, many small-scale farmers are in non-metropolitan settlements where formal agricultural markets are absent. Moreover, the same smallholders are poorly trained said Almond and Hainsworth (2005). Consequently, they are obligated to market their farm products locally and sell them at low prices in other remote areas.

2.5.10. Transportation challenges

Transportation remains a challenge to small-scale farmers to carry their products to markets and that results in low quality of harvested products (Baloyi, 2010). Also, it will be an added advantage if the smallholder has transport to sell some of the agricultural products, otherwise selling on local areas only the stock-keeping houses may not be there, as some of the products need technologies of variety to remain fresh.

2.5.11. Inconsistency in production

There is lack of consistency to production and supplying them to formal agricultural markets. Studies have reported that majority of these small-scale farmers usually carry out their products to agricultural markets and to some of agricultural-related industries for just few months of the year and afterwards they will not proceed with the supply. Thus, it makes the supermarkets and other industries who would like to stock their products from smallholders sceptical and to think twice before doing that due to their inconsistency in the market (Louw et al., 2004; Louw et al., 2007; Baloyi, 2010).

2.6. Conceptual framework

2.6.1. Age and land acquisition

The Age of the household head has an influence on the land tenure security for farming. Previously, farmers who are influential to their respective communities have been observed to be more secured than the others. The oldest farmers lose their influence in the community and

may feel more land tenure insecurity than the other groups (Holden and Hailu, 2001). Hence, the youngest of the household head was more secure than the oldest (Tsegaye, 2017). Given several recent agricultural policies that target young people, one could say that they were formulated on the basis of studies done in the past and remain relevant to the contemporary society where unemployment rate is at the peak. Therefore, young people could create a source of income for themselves and feed themselves and their households.

2.6.2. Gender and land acquisition

Historically, male headed household always have been preferred and receive much of respect in the community than women (Holden and Hailu, 2001). It can be hypothesized therefore that female headed households were more insecure about their tenure (Tsegaye, 2017). This traces back to women in the olden days who expected to be unified, to be housewives raising children and a man will be out there indulging in strenuous activities where farming was one of them. The migrant labour system somehow also segregated men from their families, and that led to female headed households which is supposed to be commended because traditionally a woman is considered as someone who is not fit to indulge in physical activities that require much energy and dedication. Women are the most prominent farmers in subsistence even to post-modern era.

2.6.3. Income and land acquisition

According to Samaniego et al., (2017) net household increase in income has got the likelihood to lessen the chances to land ownership, however, increase in net household income will increase the probability of utilizing land for agricultural activities. Households with more income ought to have financial means to acquire land for productive purposes. The study which was done by Aliber et al. (2006) shows that 13.9% of those wanting land also to utilize to generate a supplementary income. It therefore implies that households with large net household income are not certain about land ownership like their poor counterparts who want to acquire it as an asset or collateral. This links with the land reform liberal approach mostly in favour of elites, who easily can access the necessary capital (both local and foreign) (Moyo, 2013), whereby the theme lies with having money and willingness to purchase the land is prioritized.

2.6.4. Population group and land acquisition

Households belonging to black African population groups have got a higher chance of land ownership, but lower probability of making use of it. This outcome correlates with what Aliber

et al. (2006) found also, which reported 48% demand for land among black people in Limpopo, Eastern Cape, and Free State. In this study, 29% of the demand is from farm dwellers, 37% from communal areas and 34% from metropolitan areas. Forty-five percent of those demanding land want 1 ha or less, while a quarter would be satisfied with 1 to 5 ha, and 48% of the demand is from 18 to 34-year olds (Akinyemi and Mashunje, 2019). This explains the hunger that black African have for the land, due to land dispossession laws by making traces back to Apartheid era that segregated black African minority and unfairly distributed land to them, and some became landless.

2.6.5. Province and land acquisition

According to the study done by Akinyemi and Mashunje (2019) provincial variables were utilized and showed significance in association with land ownership and utilization. Households in Northern Cape, North West and Mpumalanga were found with higher probabilities having access to land compared with those in Western Cape, Gauteng, and Free State. On the other hand, households in Eastern Cape and KwaZulu Natal showed to be having lower probabilities of owning land compared with those in Western Cape, Gauteng, and Free State. On the contrary, households in Eastern Cape and KwaZulu Natal would have higher probabilities of utilizing their land for agricultural production compared with those in Western Cape, Gauteng, and Free State while households in Northern Cape, North West, Mpumalanga would have less likelihoods of using land for farming production compared with those in Western Cape, Gauteng, and Free State. This study therefore does show that the province which an individual resides in may either lessen or increase their probabilities of land acquisition for food production.

2.6.6. Education level of the household heads and land acquisition

When an individual possesses a high level of education, it increases their knowledge pertaining to land rights and administration. Educated farmers are most likely to access land than those who are uneducated. It then can be simplified that farmers with satisfactory education levels possess adequate knowledge and comprehension of land holding rights. Quite the contrary, those with low literacy levels it may be a challenge to come into terms with land related knowledge (Tsegaye, 2017). Times have changed and there is an emergence of technology in the contemporary era. The old way of doing things. Education has been modified all that, for comprehension of policies that govern the farming sector will need someone who has good literacy skills.

2.6.7. Marital status and land acquisition

An individuals' marital status does not necessarily influence their farming choices (Mdlalose, 2016). The study done by Mulaudzi (2015) found out that the marital status variable as insignificant associated in relation to gross margin of small-scale broiler production. Similarly, results from the study done by Emaikwu et al., (2011) and Dlova et al., (2004) also showed that marital status does not affect farm output. There is not much literature covering the association between marital status and land use for farming. Rather, given such empirical results, it can be concluded that more especially in rural areas, household heads primarily want to provide their families, and to female-headed households it would not be fair on their side if the marital status was associated significantly with land tenure and land use because not all of them are married.

2.7. Food production/agricultural activities

According to the study done by Baloyi, international experience shows that a noble strategy to increase the revenues of smallholders in developing countries is to get assistance that will usher them to diversification from low value food products into higher value produces, such as livestock, dairy products, fish, fruits, vegetables, and spices (Baloyi, 2010).

This is because the National Department of Agriculture reported that the demand for these agricultural products in both developing and developed countries is intensifying and growing on a rapid scale as incomes increase and consumers take on diverse diets (NDA, 2009). It is an eminent reality and undebatable, that vegetables are a perfect cash crop on both commercial and small-scale farming in developing and developed countries. Furthermore, the study of Baloyi which was narrowed to Limpopo province, specifically tomatoes and potatoes were two farm products selected to be studied as they are high-value crops and are hugely produced across South Africa as a whole (Baloyi, 2010).

The production of high-value agricultural products can have quite a breakthrough onto developing the rural livelihoods and bring about transformation in rural agriculturalists across all non-metropolitan areas in South Africa, predominantly when the production and access to markets constraints that small-scale farmers encounter. Never to mention employment prospects that households in rural areas may get, even those who may not necessarily have harvested but rather employed to regulate and sell some of the harvested farm products and in turn generate incomes.

2.8. Usage of agricultural products and stock-keeping

Whilst on the allusion of market imperfections, some of the dependent variables in this study are to examine whether smallholders have access to assistance by other entities; and to examine the usage of agricultural products and stockkeeping. Baiphethi and Jacobs (2009) on their work mentioned Johannesburg Fresh Produce Market (JFPM) which is the biggest fresh produce market in Southern Africa and an imperative market for smallholders from Limpopo and in other places. It has been dynamic in intensifying access to its trading facility made available to subsistence farmers along with informal traders.

Moreover, JFPM goes to an extent of offering training programmes to smallholders, thus enabling them to better transmit market information (such as market prices, packaging, quality of products, stockkeeping and delivery times, market agents, etc.) to farmers in areas as far as 300km away. It often runs open days throughout; whereby small farmers and informal traders are given an opportunity to visit the JFPM facilities to deepen their understanding of the workings of fresh produce markets and how they can benefit.

Additionally, JFPM has worked together with selected municipalities (e.g., Vhembe District Municipality) to build decentralised stock-keeping houses for the agricultural products and grading point facilities to well incorporate small and evolving farmers into huge fresh produce markets. These 'satellite' facilities seek to meaningfully lessen the transportation expenditures for smallholders and, with modern cold storage facilities, will enable smallholders to deliver better quality produce to the JFPM and capture the benefits (Baiphethi and Jacobs, 2009). The stock-keeping is of high significance, to keep fresh products for the consumption by the household and in cases where harvest may be teeming some may be sold fresh to locals and to any reachable surrounding markets.

2.9. Overview of Land acquisition

According to Quansah et al, (2020) in Ghana there are initiatives that took place in relation to land acquisition for investments on the livelihood of small-scale farmers. The National Jatropha Plantation Initiative (NJPI) is one of the programmes which originated back in 2006, which was aimed at developing close to one million hectares of jatropha plantations by the timeline of 2010,although there has not been sufficient evidence to postulate as to whether the target was reached or not . Nevertheless, the governments in various developing countries are more or less continually prepared to receive these investments but as Foreign Direct Investments (FDIs).

The exertions to identify factors influencing land acquisition in agriculture have been made by scholars all over the world including sub-Saharan Africa. Moreover, Ghana is among countries within the Sub-Saharan Africa region that acquired land and utilized it for establishment of plantations. However, there are remote owned companies in Ghana that major in trading Jatropha plant and of course other alternative plantations. Conversely, as the development takes place, some rational factors have encouraged the idea of large-scale land acquisition without being considerate of the welfare of the local residents (Quansah et al., 2020). In addition, given that some scholars have shown that most of small-scale farmers are rural dwellers who are survivalists, they should not be taken advantage of because of their wealth index being either poor or the poorest but in cases where they occupy land for plantations, they should receive support so they can produce more for consumption and create job opportunities.

In South Africa, land acquisition seemingly is not much in favour with women. The two studies that had complementary results were done by Woolard (2002) and Dungumaro (2008) showed that most female-headed households in South Africa are not in ownership of the land and that in turn leads to a circular of food insecurity for the reason that they were previously disadvantaged, never to mention that they are getting small earnings, particularly in rural areas. Moreover, as a result it makes it hard in cases where the land has to be acquired by means of remuneration. Once more, South Africa currently has the high unemployment rate which could be reduced, but only if the government and policy makers could screen the needs of the society as from the micro-level and allocate the land evenly especially for farming purposes.

Given that the land is very accessible in rural areas, that makes small-scale farming even more possible. According to Yusuf et al., (2014) land is an extraordinary factor of production by which countries such as Nigeria see its value to also practice crop raising for food production in it, and of course other alternative productions to improve their economic well-being. To that, the fear of losing such profitable activities which are the basis of the livelihood for the rural people typically makes it hard for them to distribute their lands for the government or others who may find land as a potential. In addition, land acquisition to Nigerian homesteads is a serious issue for the reason that, in most cases, the government would acquire land with no compensation in place, to buy or pay it to the rightful rural landowners (Yusuf et al., 2014). It is a fact that land is very essential to human life in countless ways, and one of those ways has underlying theme of economic welfare on all scales and scopes be it locally, regionally, internationally, and so on.

2.10. Government assistance to smallholders

The study done by Nxumalo on access to land and land ownership for housing and livelihood purposes suggests that the government should have funds budgeted for the land reform programmes for the reason that they cannot distribute out land devoid of having been appropriately remunerated. Additionally, the solution that could win is if the government is to undertake radical, equitable and quick actions to solve the land acquisition issue, by quickly taking the "*land without compensation and distributing it to the landless poor majority*" (Nxumalo, 2016).

However, despite all the demerits to the land reform policies, government's contribution in the past years, lump sums of money were invested on the agricultural sector by the government and have grown impressively since the mid-1990s (Aliber and Hall, 2012). There have been various programmatic attempts in the distant and recent past to support small-scale farmers. The Farmer Support Programmes (FSPs) around mid-1980s were initiated by the development Bank of Southern Africa (DBSA). During that epoch, the approach was innovative within the South African context, and placed emphasis on supporting small-scale farmers in the non-metropolitan areas, as conflicting to expensive and poorly operating big capital-intensive hometown systems such as the state-run and parastatal-run farms. The primary objective of FSPs was to promote structural change from small-scale farming to commercial production by giving wide-ranging agronomic support services and incentives to those that were farming already (Aliber and Hall, 2012; Van Rooyen, 1995:6). Whilst on the 'structural change' to subsistence farming, this study exactly places its essence on that to observe structural changes between 2015 and 2019.

Aliber and Hall (2012) mention that the FSPs programme got evaluated and somehow had its objective redefined around 1989 to concentrate intensively on offering farmer-access to support services on a wide scale. The FSPs ran between 1987 and 1993, and placed focus on supplying inputs and funding to farmers, mechanization services, public relations services, training and expansion, and research support services. The DBSA assessed that this scheme managed to reach 25 000 small-scale farmers by means of 35 FSPs before it was reached by the demise of the homelands and their reestablishment across nine provinces which emerged from the new democratic dispensation in 1994. This study thereto is broadened to nine provinces of South Africa to see if there are also any disparities regarding them being recipients of assistance from the government.

However, Hayward & Botha (1995) cited in Aliber and Hall (2012) recognized noticeable challenges in relation to extension, training and research support services offered by FSPs, such that extension staff was poorly trained, leakages in inter-organizational coordination, extreme usage of purchased inputs and subsequent indebtedness. Majority of challenges arising seem to have been the usual deficiencies linked with giving assistance to small-scale farmers. Sender (1995:254) cited in Aliber and Hall (2012) had a different perspective and maintained that though the programme could have been kept, still it was not financially feasible to be carried out throughout the years, and as result it was going to accommodate only a small proportion of rural farmers.

Nonetheless, there is still lack of funding. Even though government has made some developments in expanding accessibility to credit, most small-scale and emerging farmers still do not have access to reasonably priced credit for investment in the technology imperative for expanding and intensifying farming production or diversification of production into high value crops (Aliber and Hall, 2012; Ortmann & King, 2007). The 2005 Development Report also states that black farmers have no access to credit, financial services, and to grants other than those available for land reform recipients and the Land Bank, which was made-up to be charged with the responsibility of provision of the financial services needed for development of the smallholder farming, will now focus on advancing to established commercial farmers (DBSA, 2005).

2.11. Overview of agricultural policies in South Africa

2.11.1. Land reform policy

The land reform policy places an emphasis on land acquisition, to be made accessible to most individuals, and land is a luxury resource and accessibility to it, in non-metropolitan, specifically, signifies wealth. The neoclassical theory of land reform brings about contemporary analysis of the South African land reform. The theory suggests that land reform is focused on resource efficiency, which is essential to stimulate economic development (United Nations, 1997). Land is regarded as a vital economic resource and capital, necessary to spur development. According to Moyo (2013), the land reform liberal approach in mostly favours white farming elites, who can easily access the necessary capital (both local and foreign). This stimulates land unproductivity and expands the unfair land arrangements amongst the agricultural elites and mainstream of the black South Africans, who are classified under those considered landless. Moreover, by conforming to Eniola and Akinola (2019), land

reforms' purpose was to redress the unfair land arrangements between the white and 'few' landless blacks, and not necessarily aimed at linking the gender gap in land access and objectifying land tenure (Akinola, 2018; Dlamini and Ogunnubi, 2018).

2.11.1.1. Land redistribution

Land redistribution is not necessarily placing focus on right; rather the government is responsible for bringing about approaches that ensure equitable access to land (Mathebula, 2020). Government implemented a willing buyer, willing seller approach to land acquisition for redistribution (Akinola, 2018). Moreover, its purpose is the land reallocation to landless and those previously disadvantaged (Akinola, 2018).

However, land accessibility is among the group of other socio-economic rights that are found in the Bill of Rights. However, there is nothing clearly proposing that everybody has the right to own land (Jacobs et al., 2003). Nonetheless, there are some noteworthy human rights from which having right to access to land can be derived. From the prescriptions of Article 17 of the Universal Declaration of Human Rights, there is an outline that 'everyone has a right to own property' and that no one has the right to take that right away from anyone (Dlamini and Ogunnubi, 2018).

2.11.1.2. Land restitution

The land restitution programme intends to provide restitution of land rights to individuals and communities that got dispossessed of their rights to land when the endorsement of the 1913 Land Act in June 1913 took place (Sibanda, 2001). The African people who are foremost victims of land dispossession, because they were forcefully removed from their land which was as a set up to carry out racial segregation and separate development, suffered a lot and faced many difficulties in the overcrowded Bantustans. It, therefore, follows that the current land issues cannot be addressed without the issues of historical dispossession being addressed. Nonetheless, on the verge of apartheid ending, resolutions to this situation became more significant than ever (Sibanda, 2001).

Nevertheless, Cousins (2016) indicates that access to land through redistribution is not a right, but the government should come up with a rational framework by utilizing the available resources that will ensure the fair distribution of the land. The government adopted a willing buyer, willing seller approach to land acquisition for the purpose of redistribution, and the prices paid have commonly been around market value. Payment for land acquired for

restitution has also been at market price, and very few expropriations for land reform purposes have occurred since 1994. This is very vivid and empirical, given the market value for the land, being too expensive, never to mention the constraints that exist especially for large hectares of land where it may take years for the paperwork to be processed.

Also, though this act was consented in 1994, hitherto, there are black farmers who are still struggling to get their land back. Lahiff (2005) examined the "Smallholder Agriculture and Land Reform in South Africa", and the findings indicate that land reform contributes to reviving smallholder agriculture in South Africa. Their study recommended that the expansion of small-scale farming in South Africa needs reforms in three areas: initially, the redistribution of land and other assets from the large-scale to the smallholder sector; then, necessitate reform of agricultural markets; and finally, sponsorship for both existing and new small-scale famers.

2.11.1.3. Land tenure policy

According to the Final Report of the Presidential Advisory Panel on Land Reform and Agriculture, South Africa has two main forms of land tenure, namely, the statutory tenure (which consists of documented title deeds which can withstand legal scrutiny) and customary tenure (which does not enjoy recognition in law and money lending institutions and is largely unwritten) (FAO, 2010, Rugege et al., 2007). The purpose of land tenure is to secure rights for those who are occupying land with insecure tenure rights (Dlamini and Ogunnubi, 2018). Land tenure reform is not directly linked to the acquisition of land but rather the legal ownership status of land already occupied.

The main criticism for land reform in South Africa is that inadequate post settlement support has been offered to the beneficiaries of land (Mathebula, 2020). Therefore, land transferred to beneficiaries remained largely unproductive, resulting in minimal impact in the improvement of livelihoods of the poor. The Department of Rural Development and Land Reform introduced post settlement strategies such as the comprehensive agricultural support programme and Micro-agricultural financial Institution of South Africa in order to increase agricultural production. The land reform programme can improve livelihoods of the poor and allow all people to share land (as a resource) and reduce inequality.

2.11.2. Agricultural Finance Policy

In accordance with this policy, the emphasis is that beginner farmers should have the financial system put up to offer them the support they may need to be productive. Moreover, agricultural finance policy, also specifies that farmers who are keen to utilize the credit endowed to them to initiate farming should receive training and have advisories to give them in-depth knowledge concerning budgets and cash flows, the importance of interest rates, and the necessity to reimburse the money back to ensure yet to come credit worthiness. Furthermore, this policy expresses that the state should be responsible for facilitation and subsidization of costs of training which in turn could ease financial pressure on financial institutions, and the private donors could come in handy in reducing financial burden too (Zithutha, 2010). In general, farmers who may not be in possession of title deeds for their farming lands, or unable to meet the standards required by commercial banks for funding are habitually omitted from access to farming finance (Zithutha, 2010).

2.11.3. Micro Agricultural Financial Institutional Scheme of South Africa (MAFISA)

The Micro Agricultural Financial Institutional Scheme of South Africa (MAFISA) is a short-term service that assists financially and is offered by the state with an aim of enhancing the improvement of micro-level farmers, farm labourers, farm tenants, small landholders, the landless, evolving farmers, crop processors, micro-entrepreneurs, and the working poor (Louw et al., 2008). The state initiated the MAFISA programme with the vision that it will act as a support tool to give assistance to the working poor to run existing farming businesses, and where possible open new farming businesses and advance these into copiously money-making operations (Louw, et al., 2006 cited in Louw, et al, 2008). However, MAFISA is not likely to accommodate small-scale farmers to such levels because they are not usually sponsored (and/or subsidized) in epochs of disasters and are required to pay back loans regardless of whether there was production or not. Therefore, MAFISA is likely to be more accommodating to knowledgeable smallholder's farmers than the beginners.

2.11.4. Irrigation policy and agricultural policy

The general objective of agricultural policy reform was to create opportunities for small-scale farmers and those disadvantaged in terms of resources, improvement of efficient and therefore competitiveness of the sector; and to make use of resources sustainably (MALA, 1998). Previously, policies by the government inspired farmers to invest in capital-intensive infrastructure, inclusive of irrigation works which in turn influenced reduction in labour

demand and the fabrication of water-intensive and often inappropriate crops. In the new water regulation, a system of licensing will, sooner or later, be presented to control the access of all users to water resources. As contending consumptions for water resources increase, the cost of water to the end users, together with farmers, will without a doubt increase (MALA, 1998, Zithutha, 2010). Henceforth, farming should adjust to more balanced, cost-effective, and maintainable cropping along with water-use patterns (MALA, 1998).

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter explores and discusses research methodology. Firstly, the study area, the justification of the study, and perspective regarding the nature and type of research conducted are discussed. The second part of the chapter dwells on the research design used in this study. The sampling methods and data collection techniques are also discussed. The data analysis and its stages, in terms of how the data was organised, abridged, analysed, and presented, are discussed. Data analysis, which also includes the description of variables such as the descriptive name, position, source, and valid range of variables, establishes an important essence to this study. The procedure involving the measuring of socio-demographic, socio-economic, locational, agriculture-related variables, and household variables to test the relationship is provided. In this context, the methods of hypothesis testing are delved into, to examine whether they are true or false.

3.2 Scope and perspective

The study on land acquisition for food production is quantitative in nature as it makes use of variables, hypothesis testing and scientific sampling. From a statistical viewpoint, there is limited and little information pertaining to the profile of household heads who access land for food production in non-metropolitan areas. The study is based on socio-demographic, socio-economic, locational, such as age, gender, employment status, income, level of education, province, population group, and geography type, to name a few.

In addition, the study focused on agriculture-related variables such as agricultural activities, land tenure status, and use of agricultural products and stock keeping. Households of small-scale farmers are used as units of analysis. By bringing together the socio-demographic, socio-economic, locational, and agriculture-related variables, the study measure the association between land acquisition and its access for food production in rural areas of South Africa.

3.3. Research design

According to Leedy (1997) research design is a plan for anticipated study to be undertaken, giving the complete framework for collecting data. The work of MacMillan and Schumacher explain it as a plan for picking subjects, research areas, and procedures to be utilized for data collection which in turn will provide answers to the research question(s) outlined in the research project (MacMillan and Schumacher, 2001).

A multi-stage design was used in this study, which is based on a stratified design with probability proportional to size selection of primary sampling units (PSUs) at the first stage and sampling of dwelling units (DUs) with systematic sampling at the second stage. After assigning the sample to the provinces, the sample was further stratified by geography (primary stratification), and by population attributes using Census 2011 data (secondary stratification).

Enumerators hired and trained by Stats SA visited all the sampled dwelling units across the nine provinces. There were actual interviews and households where the unit of analysis (including multiple households) were successfully interviewed during face-to-face interviews using the GHS questionnaire.

3.4. Data source

Secondary data from the General Household Survey of 2015 and 2018 was used in this study to make a comparative analysis in order to observe if there are any structural changes, and the data was requested from Statistics South Africa (Stats SA). The 2015 and 2018 GHS comprise data relating to land acquisition and agriculture related variables, and it, actually, offers information on all variables needed for the complete of this thesis. It is noteworthy, that GHS data had a PERSON and HOUSE file which were merged together just before the analysis could be performed.

The GHS is a household survey conducted annually by Statistics South Africa (Stats SA) ever since 2002. The survey substituted the October Household Survey (OHS) which was established back in 1993 but rather got dismissed in 1999. The survey is an omnibus household-based mechanism targeted at observing any structural changes or rather the progressions regarding the development within the country. It measures, on a regular basis, the efficiency of programmes alongside the service delivery that is of quality in several key service subdivisions in the country. The GHS encompasses six wide-ranging sectors, namely education, health and social development, housing, household access to services and facilities, food security, and agriculture (Statistics South Africa, 2015). Using GHS data, this study is looking at the relationship between land acquisition for food production and individual characteristics of heads of households living in rural areas of South Africa. Moreover, the GHS data for both 2015 and 2018 was acquired from the Statistics South Africa website under the thumbnail "*Nesstar*" where it required the researcher to use the keyword "*Guests*" as both the username and password, therefore I did not need permission to access GHS data.

3.5. Instrument design

With regards to data collection, the data used in the study was collected by Statistics South Africa. The General Household Survey questionnaire was the key instrument used for collection of data from the dwelling units sampled, the households. An additional 27 quality assurors were responsible for monitoring and ensuring the questionnaire quality (Statistics South Africa, 2018).

3.6. Data Collection

The data analysed in this study is secondary data obtained from Statistics South Africa (Stats SA). The sampling weights for the data collected from the sampled households were constructed so that the responses could be suitably stretched to embody the whole national population of South Africa. The design weights, which are the inverse sampling rate (ISR) for the province, were assigned to each of the households in each province.

The enumerators were trained by Statistics South Africa (Stats SA) to embark on data collection route. The data collection technique employed was moving from place to place and interacting face-to-face with the interviewees. Those in selected dwelling units were asked for cooperation to allow the interviewer to complete the questionnaire. However, in cases where two or more households in the selected dwelling unit did not share resources, households altogether were interviewed. Regarding interviews, the GHS data also indicates that the interviews were conducted in various languages. Moreover, the sample size for GHS 2015 (*N=74449*); and GHS 2018 (*N=71137*).

3.7. Description of variables

The core purpose of this study is to identify the determinants of land tenure for subsistence production in South African households across all the nine provinces. The target population of GHS comprises all private households across all South African nine provinces alongside those who reside in workers' hotels. It is to be noted also that, the survey does not include additional communal living quarters such as students' residences, old-age hospices/facilities, clinic/hospitals, prisons, and military quarters, and is thus only representative of non-institutionalised and non-military people or households in South Africa.

As this is a comparative study, both utilizing the GHS data of 2015 and 2018, variables' codes are the same in both these data sources. Variables were picked according to those used in the GHS 2015 & 2018. These variables were divided into four categories based on the following

characteristics: socio-demographic, socio-economic, locational variables, agriculture-related, and household variables. The variables being analysed are categorised as follows

3.7.1. Socio-demographic variables

The socio-demographic variables used to describe household head characteristics are inclusive of age, gender, population group, marital status, province, and level of education.

3.7.1.1 Age

Age is one of the most important variables where an age of an individual in completed years can be documented, and averages can be derived to determine the majority and minority of those who acquire land. However, there was no specific question asked regarding this variable. According to Duba (2020) "*age is the interval of time from the day, month, and year of birth, expressed as the number of years lived by an individual, in other words, a person's age at their last birthday*". In this study, however, the ages were in completed years, but children were filtered out and only selected those from age 12. The final grouping was into four categories; **(1)** 12-22 years; **(2)** 23-33 years; **(3)** 34-44 years; **(4)** 45-55; **(5)** 56-66; and **(6)** 67 years and above.

3.7.1.2. Gender/Sex

This variable makes things simple to determine the sex or gender of an individual, whether male or female and to see as to whether the gender of the household head affects the land tenure choices positively or negatively for food production. The question asked regarding this variable was whether a person is a male or female. However, the coding was as follows **(1)** male and **(2)** as female.

3.7.1.3. Marital status

Marital status is an important variable in this study to see if one's status affects their tenure standing and influences agriculture food production. The question on marital status was asked to determine the marital status of members of the household. In relation to this study of land acquisition for small-scale farming, this variable is set to observe the disparities amongst married, single, divorced, widowed, and separated male and female in relation to agricultural activities, crop planting, and where agriculture is practiced, and whether there is an agricultural assistance from the government. In this study, this variable helps to determine if the marital status may have any effect on tenure security of an individual.

This variable also adds much essence to this study in order to observe whether the marital status of an individual can impact their tenure security positively or negatively, thus observe disparities in each marital status category. The question asked in relation to this variable was to determine the marital status of members under the household and of the head of the household. The responses were divided into eight categories: **(1)** Legally married; **(2)** Living together (husband and wife/partner); **(3)** Divorced; **(4)** Separated, but still legally married; **(5)** Widowed; and **(6)** Single.

3.7.1.4. Population group

The question asked was "What population group does household head belong to?" This variable is of prominence since it reflects how South African population is composed and it shows how a population group influences land tenure for food production, should there be any discrepancies on distribution of the land, also they shall be observed too on each. The coding was as follows: **(1)** Black/African; **(2)** Coloured; **(3)** Indian/Asian; and **(4)** White.

3.7.1.5. Level of education

To determine the level of education of those residing in the household, the question asked was: "What is the level of education that each person has completed?" This question was intended to determine the level of education successfully completed, and not the present level the person was at. However, the variables were transformed where the final coding was: **(0)** No schooling; **(1)** Primary (from grade 0 to grade 7); **(2)** Secondary (from grade 8 to grade 12); **(3)** Tertiary education.

3.7.2. Socio-economic variables

This is inclusive of employment status and income category variables.

3.7.2.1. Employment status

This variable came in handy to determine members of the household who were employed, unemployed, or not economically active, based on employment status in the seven days prior to the survey interview. To attain this, the surveyors were instructed to ask this set of questions to household members aged 15 and older. The final code list was documented as: **(1)** Employed; **(2)** Unemployed; and **(3)** Not economically active.

3.7.3. Locational variables

3.7.3.1. Province

This variable is very significant to this study as it broadens to all nine provinces of South Africa, to perceive the percentile disparities in relation to land and its use of agricultural production across these provinces, thus structural changes may be observed. The coding was as follows: **(1)** Western Cape; **(2)** Eastern Cape; **(3)** Northern Cape; **(4)** Free State; **(5)** KwaZulu-Natal; **(6)** North West; **(7)** Gauteng; **(8)** Mpumalanga; and **(9)** Limpopo.

3.7.3.2. Geographic type

This variable is basically about classifying individuals in accordance with settlement characteristics. The final coding was as: **(1)** Urban; and **(2)** Non-urban (Rural)

3.7.4. Agriculture-related variables

This includes agricultural activities, food production/agricultural activities, use of agricultural products and stock keeping, agriculture-related assistance from the government, agriculture-related assistance from any entity other than government, and practice of crop planting activities.

3.7.4.1. Agricultural activities

This variable had close-ended questions regarding involvements in agricultural activities. The question asked was “Has the household been involved in the production of any kind of food or agricultural products during the past 12 months?” (e.g. livestock, crops, poultry, food gardening, forestry, fish, etc.). The answer required was either **(1)** Yes; or **(2)** No.

3.7.4.2. Use of agricultural products and stock keeping

This variable helped to determine the reason behind growing agricultural products and keeping stock. The question asked was “What is the main purpose for growing farm products or keeping stock for the household?”. The answer was recorded as follows: **(1)** As a main source of food for the household; **(2)** As the main source of income/earning a living; **(3)** As an extra source of income; **(4)** As an extra source of food for the household; and **(5)** As a leisure activity or hobby, e.g., gardening.

3.7.4.3. Tenure status of land

The variable in this study assisted to ascertain the type of tenure status. It sought to find out how the land they use for food production is regulated, the question asked was 'on what basis does this household have access to the land used for crop production?' and it was specified that in cases where more than one kind of tenure system applies for different pieces of land, the respondent is to give an answer for the largest piece. The done list was as: **(1)** Owns the land; **(2)** Rents the land; **(3)** Sharecropping; **(4)** Tribal authority; and **(5)** State land.

3.7.5. Household variables

3.7.5.1. Household headship

This new variable was used in this study to allow for description of disparities between both males and females who were head of household and those who were not. Henceforth, this new variable was created and documented as follows: **(1)** Headed by male; **(2)** Headed by female.

3.8. Methods of data analysis

A comparison of perceived findings with anticipated findings is predominantly the objective of data analysis. Moreover, for data analysis execution, the computer was utilized since the GHS data contains huge data and a set of variables. Data was manipulated through usage of SPSS version 25. The univariate, bivariate, and multivariate statistical methods were utilized to analyse the data. The univariate analysis, such as descriptive statistics, was used for exploration of the dataset.

The bivariate analysis, using cross-tabulation and chi-square test statistics, was used to test the relationship amongst the independent and dependent variables deliberated in this study. Multivariate analysis using logistic regression was also used to classify factors contributing to land tenure and land use for agriculture among household heads' residing in non-metropolitan areas. Onto determining a significant association between two variables, a p-value of less than 0.05 (<0.05) was considered.

3.8.1. Univariate analysis

Univariate analysis is a method used to analyse data by a single variable. It synopsizes data and makes it easy to compute percentages. Descriptive statistics is used in this study explicitly to display the dissemination and values of certain variables by making use of frequency tables and graphs.

3.8.2. Bivariate analysis

However, since the use of univariate analysis only was not sufficient to answer the research questions and outlined objectives for this study, bivariate analysis was considered. Data analysis of this kind is carried out to examine if there is an association that exists between independent and dependent variables. The results can be presented through cross-tabulation (two-way table) to exhibit the percentages patterns.

3.8.2.1. Cross-tabulation/classification

In this study, socio-demographic variables, socio-economic variables, locational variables, and household variables were cross-tabulated with land variables to examine if there is any association among them. For instance, through usage of SPSS, the province of birth of household head was cross-tabulated with land tenure status. This procedure allowed to create tables with percentages which in turn made things much simpler for the researcher to measure the pattern of the percentages. This technique supported this study to better understand, for example, the land tenure choice is highly used by small-scale farmers household head relatively to household headship in rural areas.

3.8.2.1.1. Chi-square

Test statistic 'Chi-square' associates two variables in a contingency table to determine if there is any association or whether they vary from each other. If the significance level is not more than the cut-off value of 0.05, that denotes that there is an association (significant relationship) among the variables. In this case, the hypothesis is supported by the findings. On the other hand, if the p-value is more than 0.05, this indicates there is no significant relationship among the variables, and the hypothesis is rejected.

The formula for Chi-square test statistic: $\chi^2 = \sum (O_i - E_i)^2 / E_i$

3.8.3 Multivariate analysis

Multivariate analysis denotes statistical methods altogether that concurrently analyse multiple measurements on entities under study. Therefore, any simultaneous analysis of over and above two variables can be loosely deliberated as multivariate analysis (Joseph et al., 2010; Johnson and Wichern, 2007).

3.8.3.3. Logistic regression

Firstly, the dependent variables such as tenure status, agricultural activities, and use of agricultural products were dichotomised. The independent variables were simultaneously included in the model (Nsengiyumva, 2013). Hosmer-Lemeshow goodness-of-fit informed us how closely the observed and predicted probabilities match. In this case a *p>0.05* indicated that the model fit the data. In addition, 5% was used as cut off point as a level of significance. If Hosmer-Lemeshow goodness-of-fit test statistics is greater than 0.05, as we want for well-fitting models, this implies that the model's estimates fit the data at an acceptable level. That is well-fitting model show non-significance on the H.L goodness-of-fit test. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed (Nsengiyumva, 2013).

With regards to the variables in the equation table, any variable with a *p<0.05* was considered as significant but even any variable with 0.07 value was considered as significant in the model. The emphasis here is to note that this is different from Hosmer Lemeshow which provides a p*>0.05*. The Wald estimate provides the importance of the contribution of each variable in the model. The higher the value, the more important it is. The Exp (B) gives the Odds Ratios. In other words, it gives the likelihood of an event to occur (Nsengiyumva, 2013). Actually, Logistic regression model predicts binary dependent variable y from interval or binary independent variables $x_1, x_2, \ldots, x_n$

The equation of model is:

$p(y=1) = \frac{\exp(z)}{1+\exp(z)}$ where $z = b_0 + b_1x_1 + \cdots + b_nx_n$

Estimated model $\hat{p}(y=1) = \frac{\exp(\hat{z})}{1+\exp(\hat{z})}$ $\hat{z} = \hat{b}_0 + \hat{b}_1x_1 + \cdots \hat{b}_nx_n$

Where $\widehat{b_i}$ are derive b maximum likelihood estimation

$b_0, b_1 \ldots\ldots, b_n$ are regression coefficients, where b_i is change in log-odds of $y = 1$ (the events happening) for unit change in x_i with other independent variables held constant.

Equivalently,exp (b_i) is change in odds of $y = 1$ (the event happening) for change in x_i.

When x_i is a binary variable, exp (b_i) is the change in odds of $y = 1$ where x_i changes from 0 to 1, where $x_i = 0$ is treated as reference category.

CHAPTER 4: FINDINGS

4.1. Introduction

In this chapter, all the results from the study are presented based on objectives used in this study. First to be presented are the results from univariate and bivariate analysis. For univariate, it presents food production trends between 2015 and 2018 using both dependent and independent variables.

4.2 Sample composition

The study focuses on household heads who access land for subsistence food production across nine provinces in South Africa. The survey results are portrayed in Table 4.1 below. The survey results show an overall number of participants to be 74 449 and 71 137 respectively enumerated in the 2015 and 2018 General Household Survey. The results indicate the imbalance between genders, females being more (52.4%) than males (47.6%) for 2015. Although there were just minor dissimilarities, males still occupied a low percentage (47.4%) and females (52.6%) for 2018. Also pertaining to the age group, the sample was composed of in younger ages being the majority partaking in the survey, those aged 12-22 were more with 26.7%, followed by those in ages between 23-33 with 24.5% for 2015, and for 2018 percentages slightly decreased to 26.1% and 23.7%.

Looking at population group, results indicate that African/Black and Coloureds were the population groups that were a majority during the survey period, with 82.2% and 9.3% respectively by 2015, and for 2018 they were 83.7% and 9.2%. Indian/Asian were the smallest population group involved in the survey, with only 2.1% of its population by 2015, and only 1.7% by 2018. With regards to marital status, the results from table 4.1 below indicate a high percentage of participants being single with 66.2% for 2015, and for 2018 were more with 67.0%, followed by those married virtually the same for both years with 26.7% for 2015 and 26.0% for 2018.

The results further indicate a meagre 1.4% of participants among those divorced remaining constant for both years. Among the population surveyed, males heading households were more (54.2%) compared to females (45.8%) by 2015, still it was the case for 2018 with female-headed households occupying 47.2% as compared to their counterparts' male-headed households occupying a high percentage of 52.8%.

The results indicated a plentiful of individuals being those who possessed secondary level of education (46.2%) for 2015 and (48.3%) for 2018, followed by those with primary level of education which were virtually the same (28.4%) for 2015 and (28.1%) for 2018, with those who occupied higher education being the least (8.5%) for 2015 and (8.1%) for 2018. However, those with no education at all also constituted quite a higher percentage, given the percentage of those with higher education, those with no education were 16.4% by 2015 and decreased to 15.5% by 2018.

With regards to employment status, majority of participants were not economically active for both 2015 and 2018 respectively with 46.1% and 45.3%, followed by those who were employed (41.6%) and (40.9%). The data indicated those who were not unemployed were the least of the population for 2015 (12.4%) and 2018 (13.8%). The findings further indicated that Gauteng was the province with the highest response rate among all provinces, which could be because it is the most populous province compared to others, with 21.8% for 2015 and increased to 22.0% by 2018, followed by KwaZulu-Natal with 18.2 by 2015 and went down vaguely to 18.1% by 2018. With other provinces surveyed, nonetheless, Northern Cape showed the least percentage of 4.7% which remained the same for 2018 which could also be because it is the province with smaller population concentrated there.

Moreover, those settling in urban areas are more than those in non-urban settlement types, those who resided in urban areas constituted a high percentage for both years with 61.2% for 2015, which went up a bit to 61.3% by 2018, whereas those who resided in non-urban areas also occupied a low percentage of 38.8% for 2015 and for 2018 went decreased to 38.7%.

Table 4.1: Frequency distributions for independent variables

Characteristics	2015		2018	
	n	Percent	n	Percent
Gender				
Male	35 438	47.6	33 695	47,4
Female	39 011	52.4	37 442	52,6
Total	74 449	100,0	71 137	100,0
Age group				
12-22	14 938	26,7	14 048	26,1
23-33	13 692	24,5	12 773	23,7
34-44	10 258	18,4	10 044	18,6
45-55	7 979	14,3	7 643	14,2
56-66	5 300	9,5	5 478	10,2
67+	3 712	6,6	3 911	7,3
Total	74 449	100,0	71 137	100,0
Population group				
African/Black	61 241	82,3	59 541	83,7
Coloured	6 960	9,3	6 538	9,2
Indian/Asian	1 591	2,1	1 218	1,7
White	4 657	6,3	3 840	5,4
Total	74 449	100,0	71 137	100,0
Marital status				
Married	19 836	26,7	18 445	26,0
Divorced	1 022	1,4	969	1,4
Separated, but still legally married	444	0,6	420	0,6
Widowed	3 846	5,2	3 629	5,1
Single	49 182	66,2	47 555	67,0
Total	74 449	100,0	71 137	100,0
Household headship				
Headed by male	40 337	54,2	37 573	52,8
Headed by female	34 112	45,8	33 564	47,2
Total	74 449	100,0	71 137	100,0
Education status				
No education	11 925	16,4	10 841	15,5
Primary	20 979	28,4	19 627	28,1
Secondary	33 641	46,2	33 746	48,3
Tertiary	6 202	8,5	5 654	8,1
Total	74 449	100,0	71 137	100,0
Employment status				
Employed	21 576	41,6	20 310	40,9
Unemployed	6 430	12,4	6 838	13,8
Not Economically Active	23 913	46,1	22 509	45,3
Total	74 449	100,0	71 137	100,0

Province				
Western Cape	7 139	9,6	6 920	9,7
Eastern Cape	10 258	13,8	9 542	13,4
Northern Cape	3 484	4,7	3 339	4,7
Free State	4 409	5,9	4 095	5,8
KwaZulu-Natal	13 582	18,2	12 873	18,1
North West	4 807	6,5	4 366	6,1
Gauteng	16 222	21,8	15 623	22,0
Mpumalanga	6 141	8,2	6 064	8,5
Limpopo	8 407	11,3	8 315	11,7
Total	74 449	100,0	71 137	100,0
Geography type				
Urban	45 568	61,2	43 591	61,3
Non-Urban	28 881	38,8	27 546	38,7
Total	74 449	100,0	71 137	100,0
NB: Gender (only used to control for all variables)				

Source: Author's own calculations from 2015 and 2018 General Household Survey data

Furthermore, the results regarding the dependent variables (see table 4.2 below) show distributions and patterns of percentages in relation to characteristics that were of choice by the researcher on household heads who acquire land for subsistence food production across South African provinces. The results show that there are a few numbers of individuals involved in agricultural activities. The study done by Baloyi (2010) found out that small-scale farmers in developing countries come across massive challenges, one of them being poor land acquisition. Even those who have land, they lack on-farm infrastructure which comprises resources which could be utilized to speed up production. As a result, the study by Baiphethi reported that in specification to South Africa, it is prone to de-agriculture due to land constraints that ongoingly exist (Baiphethi, 2009). As it can be reflected on table 4.2 below, by 2015 only 25.3% were indulged in agricultural activities, and 74.7% were reported to be agriculturally not involved, and by 2018 those who were practicing farming decreased to 24.0% and those who were not in pursuit of agricultural activities were more as compared to 2015 by having increased to 76.0%.

The data depicted in table 4.2 below indicates the use of agricultural products and stock-keeping. It shows that those who use them as an extra source of food for the household were more with 79.9% for 2015, however decreased to 76.3% by 2018, followed by those who use them as the main source of food for the household with 8.0% for the year 2015 and were more by 2018 by 9.0%. However, those who used them as the main source of income or earning a living were the least of the population with 1.5% for 2015 and were more by 2018 with 2.1%.

More so, the findings indicate that with regards to tenure status of the land, the majority owns the land they are occupying with 64.2% by 2015, and by 2018 decreased to 63.4%, followed by those who occupy a land which is under tribal authority with 33.5% for both years and it remained at the same percentage. The least of the population were those who occupy land for sharecropping land with 0.6% by 2015, and 0.8% by 2018.

The respondents indicated that they use their farmed products as a form of livelihood diversification. A sampled 79.9% % and 76,3% of respondents for both years was reported to use their farm products as an extra source of food for the household. Followed by respondents who used their agricultural products and stockkeeping as a main source of food for the household, 8,0% and 9.0% respectively was reported. The least of the population was among respondents who used their farm products as the main source of income/earning a living, with reported percentages 1,5% for 2015, and increased to 2,1% by 2018.

Table 4.2: Distribution of land related variables

Characteristics	2015		2018	
	n	Percent	n	Percent
Agricultural activities				
Yes	18 791	25,3	16 965	24,0
No	55 360	74,7	53 775	76,0
Total	74 449	100,0	71 137	100,0
Tenure status of land				
Owns the land	9 003	64,2	7 956	63,4
Rents the land	132	0,9	134	1,1
Sharecropping	80	0,6	102	0,8
Tribal authority	4 704	33,5	4 204	33,5
State land	110	0,8	159	1,3
Total	74 449	100,0	71 137	100,0
Use of agricultural products and stock keeping				
As a main source of food for the household	1 480	8,0	1 505	9,0
As the main source of income/earning a living	272	1,5	343	2,1
As an extra source of income	900	4,9	1 046	6,3
As an extra source of food for the household	14 695	79,9	12 749	76,3
As a leisure activity or hobby e.g., gardening	1 054	5,7	1 069	6,4
Total	74 449	100,0	71 137	100,0

***Source*:** Author's own calculations from 2015 and 2018 General Household Survey data

4.3. Distribution of agricultural activities

In this subsection, all the dependent variables were cross tabulated with the independent variables to observe the relationship among them, chi-square test statistic was used to test significance level which has its cut-off value as 0.05, alongside Phi and Cramer's V coefficients were used to test the strength of the association. More so, gender was used as a variable to control throughout, thus observing any disparities that exist among males and females in-between the years 2015 and 2018.

4.3.1. Agricultural activities by age group and gender

The study analysed the findings by cross-tabulating data using agricultural activities across selected age groups and controlled by gender. The hypothesis is that younger household heads are more likely to be agriculturally involved. As depicted in table 4.3 below, the findings show that most of small-scale farmers who are males in ages 12-22 are in agricultural activities, percentages with 39,6% and 38,4% respectively. Moreover, in ages 23-33 males remained to occupy a high percentage. However, of the sampled population, females aged 67 and above in agricultural involvement reported high over males. The reason behind could be due to life expectancy of males being lower than females, meaning most of males rarely reach ages which are as from 67 and above. Inheritance also might play a big role among older women to acquire land for agricultural purposes. Thus, the involvement in agricultural activities.

Additionally, based on these results, the study has discovered that engagement in agricultural activities decreases with age, the more household heads advance in years, the higher the chances they are likely to be discouraged to get into agriculture-related activities. The findings are objective enough to support the hypothesis. A Chi-square test statistic showed a significant relationship between agricultural activities and age group, since the p-value= 0.000<0.05. Moreover, the Phi and Cramer's V were used to measure the strength of the relationship between the above variables. The findings showed a moderate relationship 0.131 and 0.129 respectively.

Table 4.3: Distribution of agricultural activities by age group and gender

Gender	Agricultural activities	Age group (2015)						
		12-22	**23-33**	**34-44**	**45-55**	**56-66**	**67+**	Total
Male	Yes	2311	1118	748	685	556	424	5842
		39,6%	19,1%	12,8%	11,7%	9,5%	7,3%	100,0%
	No	5173	5466	4091	2842	1705	909	20186
		25,6%	27,1%	20,3%	14,1%	8,4%	4,5%	100,0%
	Total	7484	6584	4839	3527	2261	1333	26028
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	2085	1371	1089	1071	868	839	7323
		28,5%	18,7%	14,9%	14,6%	11,9%	11,5%	100,0%
	No	5323	5673	4281	3359	2151	1532	22319
		23,8%	25,4%	19,2%	15,0%	9,6%	6,9%	100,0%
	Total	7408	7044	5370	4430	3019	2371	29642
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Age group (2018)							
Male	Yes	2003	978	668	560	577	429	5215
		38,4%	18,8%	12,8%	10,7%	11,1%	8,2%	100,0%
	No	4994	5122	4145	2751	1711	995	19718
		25,3%	26,0%	21,0%	14,0%	8,7%	5,0%	100,0%
	Total	6997	6100	4813	3311	2288	1424	24933
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	1861	1222	973	975	896	803	6730
		27,7%	18,2%	14,5%	14,5%	13,3%	11,9%	100,0%
	No	5115	5371	4195	3316	2263	1668	21928
		23,3%	24,5%	19,1%	15,1%	10,3%	7,6%	100,0%
	Total	6976	6593	5168	4291	3159	2471	28658
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

***Source*:** Author's own calculations from 2015 and 2018 General Survey Household data

4.3.2. Differentials in agricultural activities by population group and gender

The table 4.4 below shows the distribution of agricultural activities and population group. The findings show that most of small-scale farmers are black females involved in agricultural activities more than other racial groups. According to Aliber et al. (2006), black households have a high probability of owning land, though they may not satisfactorily use it, followed by white males who reported a 2,8% and 2,4% respectively, in both years. In addition, the Indian population group has the least of small-scale farmers involved in agricultural activities.

Furthermore, Aliber's work showed also that African/black is the predominant racial group involved in agriculture, and Cousins (2000) revealed that apartheid regime had unfair tenure distributions, which left blacks vulnerable to poverty and landlessness. Additionally, the results

support the formulated hypothesis that black/African females heading households are more involved in agricultural activities than males across nine provinces of South Africa.

The Chi-square test statistic relationship between agricultural activities and population group, showed a p-value of 0.000<0.05, denoting significance. To measure the strength of the relationship between the variables, the Phi and Cramer's V respectively (0.192, 0.185) tests were used and showed a moderate association.

Table 4.4: Distribution of agricultural activities by population group and gender

Gender	Agricultural activities	Population group (2015)				
		African/Black	**Coloured**	**Indian/Asian**	**White**	Total
Male	Yes	8232	203	46	244	8725
		94,3%	2,3%	0,5%	2,8%	100,0%
	No	20728	3062	770	2009	26569
		78,0%	11,5%	2,9%	7,6%	100,0%
	Total	28960	3265	816	2253	35294
		100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	9572	214	32	248	10066
		95,1%	2,1%	0,3%	2,5%	100,0%
	No	22455	3473	733	2130	28791
		78,0%	12,1%	2,5%	7,4%	100,0%
	Total	32027	3687	765	2378	38857
		100.0%	100.0%	100.0%	100.0%	100.0%
		Population group (2018)				
Male	Yes	7467	148	19	186	7820
		95,5%	1,9%	0,2%	2,4%	100,0%
	No	20542	2921	593	1636	25692
		80,0%	11,4%	2,3%	6,4%	100,0%
	Total	28009	3069	612	1822	33512
		100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	8771	161	23	190	9145
		95,9%	1,8%	0,3%	2,1%	100,0%
	No	22413	3295	583	1792	28083
		79,8%	11,7%	2,1%	6,4%	100,0%
	Total	31184	3456	606	1982	37228
		100.0%	100.0%	100.0%	100.0%	100.0%

***Source*:** Author's own calculations from 2015 and 2018 General Household Survey data

4.3.3. Differentials in agricultural activities by marital status and gender

Based on the findings in table 4.5 below, an illustration shows that of all the sampled population, most of the small-scale farmers were among males who were single, who reported to be agriculturally involved, with 76,4% and 76,7%, respectively for both years. Followed by females who were married, who reported a 21,9% by 2015, and decreased to 21,3% by 2018. The findings further depict that those who are separated, but still legally married reported the lowest to be involved in agricultural activities, considering all the nuptial categories.

Chi-square test statistic was used to assess the relationship between agricultural activities and marital status. The findings showed a p-value of 0.000<0.05. Therefore, since the p-value of 0.000 is less than the cut-off value of 0.05, the test statistic thereto denotes a positive relationship between agricultural activities and marital status. In addition, Phi and V tests showed an 0.084 and 0.076, which denotes a weak association.

Table 4.5: Differentials in agricultural activities by marital status and gender

Gender	Marital status	Agricultural activities (2015)					
		Married	**Divorced**	**Separated, but still legally married**	**Widowed**	**Single**	Total
Male	Yes	1790	59	46	160	6657	8712
		20,5%	0,7%	0,5%	1,8%	76,4%	100,0%
	No	7978	288	125	427	17703	26521
		30,1%	1,1%	0,5%	1,6%	66,8%	100,0%
	Total	9768	347	171	587	24360	35233
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	2198	116	71	1129	6538	10052
		21,9%	1,2%	0,7%	11,2%	65,0%	100,0%
	No	7806	551	200	2118	18072	28747
		27,2%	1,9%	0,7%	7,4%	62,9%	100,0%
	Total	10004	667	271	3247	24610	38799
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Agricultural activities (2018)						
Male	Yes	1588	66	44	121	5991	7810
		20,3%	0,8%	0,6%	1,5%	76,7%	100,0%
	No	7486	253	131	399	17374	25643
		29,2%	1,0%	0,5%	1,6%	67,8%	100,0%
	Total	9074	319	175	520	23365	33453
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	1946	107	59	1029	5989	9130
		21,3%	1,2%	0,6%	11,3%	65,6%	100,0%
	No	7317	537	183	2064	17937	28038
		26,1%	1,9%	0,7%	7,4%	64,0%	100,0%
	Total	9263	644	242	3093	23926	37168
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.3.4. Differentials in agricultural activities by household headship and gender

Considering household heads who are small-scale farmers, and are agriculturally involved, the findings in table 4.6 below depict that female headed households are more involved in agricultural activities compared with male headed households, the percentage reported for 2015 was 52,7%, and increased to 54,6% by 2018. Consequently, these findings answer one of the research questions that, based on the increase of females taking part in small-scale farming and agriculturally involved, there are dissimilarities that coexist with agricultural involvement

among household heads, and the hypothesis that the number of small-scale farmers households involved in agricultural activities has increased from 2015 to 2018.

Furthermore, the findings match up the study done by Ellis, which revealed that many households are headed by females, which means that responsibilities in families fall on their shoulders (Ellis, 1998). Whilst on the issue of responsibilities, men are very likely to pass on and leave their families, which compels women to be the heads of their households, with a responsibility to provide. In cases where a woman may not have adequate financial means to provide for the household, subsistence food production becomes a refuge for food security.

Chi-square test statistic showed a significance between agricultural activities and household headship, meaning that there is a relationship between agricultural activities and household headship. To test the strength of the relationship, Phi and Cramer's V were used respectively -0.081 and 0.081, and Phi coefficient showed a negative weak association, whilst Cramer's V showed a positive weak association by 2015. Similarly, by 2018, Phi's coefficient showed a negative weak association with -0.083, while Cramer's was 0.083.

Table 4.6: Distribution of agricultural activities by household headship and gender

Household headship	Agricultural activities (2015)		
	Headed by male	**Headed by female**	Total
Yes	8884	9907	18791
	47,3%	52,7%	100,0%
No	31322	24038	55360
	56,6%	43,4%	100,0%
Total	40206	33945	74151
	100,0%	100,0%	100,0%
Agricultural activities (2018)			
Yes	7705	9260	16965
	45,4%	54,6%	100,0%
No	29645	24130	53775
	55,1%	44,9%	100,0%
Total	37350	33390	70740
	100,0%	100,0%	100,0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.3.5. Agricultural activities by highest level of education and gender

The study findings reveal that most females were agriculturally involved, with 40,1% by 2018 possessing secondary level of education. On the other hand, with males, a majority fell among those who had primary level of education who reported a 39,6% which was in 2015. Moreover, the findings show that being a small-scale farmer and having tertiary educational level tends to decrease the likelihoods of getting involved in farm activities (see table 4.7 below).

The findings showed a p-value of 0.000 denoting significant relationship between agricultural activities and highest level of education. To measure the strength of the relationship, Phi and Cramer's tests were used. Therefore, 0.144 and 0.152 respectively, both showing a moderate association.

Table 4.7: Distribution of agricultural activities by highest level of education and gender

Gender	Agricultural activities	Highest level of education (2015)				
		No education	**Primary**	**Secondary**	**Tertiary**	Total
Male	Yes	1758	3399	3081	344	8582
		20,5%	39,6%	35,9%	4,0%	100,0%
	No	3745	6956	12638	2487	25826
		14,5%	26,9%	48,9%	9,6%	100,0%
	Total	5503	10355	15719	2831	34408
		100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	2192	3368	3822	536	9918
		22,1%	34,0%	38,5%	5,4%	100,0%
	No	4181	7180	13963	2813	28137
		14,9%	25,5%	49,6%	10,0%	100,0%
	Total	6373	10548	17785	3349	38055
		100.0%	100.0%	100.0%	100.0%	100.0%
	Highest level of education (2018)					
Male	Yes	1581	2926	2878	284	7669
		20,6%	38,2%	37,5%	3,7%	100,0%
	No	3444	6648	12794	2260	25146
		13,7%	26,4%	50,9%	9,0%	100,0%
	Total	5025	9574	15672	2544	32815
		100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	1862	3075	3610	462	9009
		20,7%	34,1%	40,1%	5,1%	100,0%
	No	3901	6871	14257	2623	27652

		14,1%	24,8%	51,6%	9,5%	100,0%
	Total	5763 100.0%	9946 100.0%	17867 100.0%	3085 100.0%	36661 100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.3.6. Differentials in agricultural activities by employment status and gender

In relation to being a small-scale farmer and how employment status influences agricultural involvement, it is illustrated in table 4.8 and findings from the study show that most females who are not economically active were agriculturally involved with 67,4% and 64,7% respectively, in both years. However, given the employed who were in agricultural involvement, males reported higher percentages with 28,9% and 29,3% respectively, results still show that there are dissimilarities that hint the discrimination of women by society which leads them to take inferior positions of employment on the job market.

The Chi-square test statistic was used to assess the relationship between agricultural activities and employment status. The findings showed a p-value of 0.000. As a result, given that the p-value of 0.000 is less than the cut-off value of 0.05, the test statistic indicated significance. This means that there is a relationship between agricultural activities and employment status. To measure the strength of the relationship between the variable, the Phi and Cramer's V showed a moderate relationship with 0.198 and 0.171 respectively.

Table 4.8: Distribution of agricultural activities by employment status and gender

Gender	Agricultural activities	Employment status (2015)			
		Employed	**Unemployed**	**Not Economically Active**	Total
Male	Yes	1491	631	3036	5158
		28,9%	12,2%	58,9%	100,0%
	No	10303	2338	6187	18828
		54,7%	12,4%	32,9%	100,0%
	Total	11794	2969	9223	23986
		100,0%	100,0%	100,0%	100,0%
Female	Yes	1544	652	4544	6740
		22,9%	9,7%	67,4%	100,0%
	No	8130	2786	10077	20993
		38,7%	13,3%	48,0%	100,0%
	Total	9674	3438	14621	27733
		100.0%	100.0%	100.0%	100.0%
	Employment status (2018)				
Male	Yes	1337	656	2564	4557
		29,3%	14,4%	56,3%	100,0%
	No	9576	2562	6145	18283
		52,4%	14,0%	33,6%	100,0%
	Total	10913	3218	8709	22840
		100,0%	100,0%	100,0%	100,0%
Female	Yes	1465	677	3927	6069
		24,1%	11,2%	64,7%	100,0%
	No	7792	2914	9756	20462
		38,1%	14,2%	47,7%	100,0%
	Total	9257	3591	13683	26531
		100.0%	100.0%	100.0%	100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.3.7. Agricultural activities by province and gender

The results show small-scale farmers who are female to be more involved in agriculture-related activities than males. Herewith, Appendix 1 shows the distribution of agricultural activities and province. A high percentage was reported among females in agricultural involvements from Limpopo with 24,9% over males who nonetheless were from Eastern Cape that reported a 24,4% by 2015. Likewise, in 2018 the data shows most females in agricultural involvement from KwaZulu-Natal and Limpopo occupying the same percentage of 24,5%. However, males recorded a lower percentage of 24,3% from KwaZulu-Natal. It worth mentioning as well, that

small-scale farmers from Western Cape reported very low in relation to agricultural involvement. These findings support the work of Pinaar and Traub, (2015) that the small holder farmers consist of 4 million of black farmers farming in the former homeland area of 13% of agricultural land of South Africa.

Further analysis was carried out by means of Chi-square test statistic. The results indicate an association between both agricultural activities and province at p=.000<0.05, meaning that there is a relationship between agricultural activities and province. The Phi and Cramer's V showed a relatively strong relationship of 0.407 and 0.385 respectively.

4.3.8. Distribution of agricultural activities by geographic type and gender

Geographic type is one of the important characteristics, to exhibit if most household heads who practice small-scale farming and are involved in agricultural activities are located in either urban or non-urban settlement types. The findings in table 4.9 reveal that females in non-urban areas are the most involved in agricultural activities for both years, and by 2015 females reported 81,6% and increased to 82,0% by 2018. Land is a very substantial resource that can be utilized to practice agricultural activities, and a massive number of households residing in rural areas (non-urban) depend so much on land for food production and consumption (Nyirasafari, 2009).

Given the p=0.000<0.05, it means that there is a relationship between agriculture activities and geographic type. In relation to Phi and Cramer's V tests, Phi's coefficient showed a negative weak relationship -0.507 and -0.495 respectively. On the other hand, Cramer's V statistical test of strength indicated a moderate positive relationship for both years with 0.507. As a result, the findings fully support the hypothesis that "The household involvement in the agricultural activities differ by geographic type, where the household is located".

Table 4.9: Distribution of agricultural activities by geographic type and gender

Gender	Agricultural activities	Geographic type (2015)		
		Urban	**Non-Urban**	Total
Male	Yes	1674 19,2%	7051 80,8%	8725 100,0%
	No	20213 76,1%	6356 23,9%	26569 100,0%
	Total	21887 100,0%	13407 100,0%	35294 100,0%
Female	Yes	1849 18,4%	8217 81,6%	10066 100,0%
	No	21623 75,1%	7168 24,9%	28791 100,0%
	Total	23472 100.0%	15385 100.0%	38857 100.0%
	Geographic type (2018)			
Male	Yes	1455 18,6%	6365 81,4%	7820 100,0%
	No	19353 75,3%	6339 24,7%	25692 100,0%
	Total	20808 100,0%	12704 100,0%	33512 100,0%
Female	Yes	1644 18,0%	7501 82,0%	9145 100,0%
	No	20845 74,2%	7238 25,8%	28083 100,0%
	Total	22489 100.0%	14739 100.0%	37228 100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.4. Differentials in tenure status of land among small-scale farmers

4.4.1. Differentials in tenure status of land by age group and gender

The findings of the study in Appendix 2 show that small-scale farmers who are male, aged between 12-22 own the land and results further depict that they are likely to use it for share-cropping more than their female counterparts in both years. Although these findings portray the predominant tenure status for small-scale farmers in ages 12-22 to be occupying tribal-owned land among males, one of the reasons could be that most of the small-scale farmers are

from non-urban settlements, where in many cases, land is acquired through tribal authority. Notably, the last of the sampled population reported among small-scale farmers is aged 67 and above. According to Tsegaye (2017) individuals in younger age groups have higher chances to be favoured by tenure security than the old.

A Chi-square test statistic was performed to examine the association between tenure status of land and age group and reported the p-value of 0.000 which denotes significance. Moreover, Phi and Cramer's V tests showed a weak relationship, 0.084 and 0.042 respectively by 2015. Similarly, by 2018, 0.083 and 0.042 respectively.

4.4.2. Distribution of tenure status of land by population group and gender

The blacks were found to own the land more than other racial groups. The findings from Appendix 3 show that black small-scale farmers who are females are very disposed to occupy a tribal-owned land. However, when it comes into owning the land, black females who are small-scale farmers have got higher chances surpassing their male counterparts in both years. Pinaar and Traup (2015) suggest that household select into farming activities to feed the household to minimise food expenditure from more formal market channels. The fact that Indian/Asian populations are not much interested in farming could be as a result that most of Indians are typically into retailing and services that sell non-farm products to survive.

A Chi-square test statistic was performed to examine the association between tenure status of land and population group. The findings indicate a p-value= 0.000<0.05. The test statistic showed a significant relationship between the two variables. Moreover, Phi and Cramer's V was used to measure the strength of the association. The values showed a moderate relationship (0.147) for Phi's coefficient. On the contrary, Cramer's V (0.085) independently showed a weak association by 2015. However, by 2018, Phi's coefficient was 0.235 denoting a relatively stronger relationship. On the other hand, Cramer's V was 0.136 denoting a moderate association.

4.4.3. Tenure status of land by marital status and gender

The findings on land tenure and marital status as depicted on Appendix 4 show that small-scale farmers who are single males are more likely to own the land more than those who are either married, widowed, separated, or divorced females. The findings exhibited that male small-scale farmers own the land more than their female counterparts in both 2015 and 2018, 75,4% and

75,2% respectively, followed by the married. The findings depict female small-scale farmers to be tenure secure than males, with 22,7% and 22,0% in that order.

In addition, the results further show that single male smallholders own land to practice crop planting activities (sharecropping) more than their female counterparts, 83,8% and 78,8% respectively. More so, females remain to be tenure insecure as compared to males. The disparities depicted on the findings necessitate a rapid remedy to get rid of the land constraints that coexist with land acquisition for food production given that there are more female headed households in South Africa. A Chi-square test statistic showed significant association among tenure status of land and marital status. Additionally, Phi and Cramer's V displayed a weak association 0.084 and 0.042 by 2015. Likewise, by 2018, 0.078 and 0.039, showing a weak association.

4.4.4. Tenure status of land by household headship and gender

The results in table 4.10 below concerning household headship and tenure ownership show that there were more female small-scale farmers heading household in 2015 owning the land as compared to males, with 52,6% by 2015 and increased to 54,4% by 2018. Moreover, female small-scale farmers who were heading households reported high percentages in relation to occupying a land to plant and produce crops (sharecropping) than their counterparts on both years. In correlation, findings are reasonably linking as from the inception, disclosing that there are more female headed households who are agriculturally involved. Often, farming activities form an important part of livelihood strategy as most rural people are either directly or indirectly linked to agriculture (Pinaar and Traut, 2015)

A Chi-square test statistic was used to weigh the level of association between tenure status of land and household headship. The findings indicate a p-value= 0.000<0.05, hence there is astatistical evidence to conclude that there is a significant relationship between tenure status of land and household headship. The Phi and Cramer's V 0.079 and 0.050 independently showed a weak association.

Table 4.10: Distribution of tenure status of land by household headship and gender

Household headship	Tenure status of land (2015)		
	Headed by male	**Headed by female**	Total
Owns the land	4265 47,4%	4738 52,6%	9003 100,0%
Rents the land	72 54,5%	60 45,5%	132 100,0%
Sharecropping	26 32,5%	54 67,5%	80 100,0%
Tribal authority	1894 40,3%	2810 59,7%	4704 100,0%
State land	70 63,6%	40 36,4%	110 100,0%
Total	6327 100.0%	7702 100.0%	14029 100.0%
Tenure status of land (2018)			
Owns the land	3628 45,6%	4328 54,4%	7956 100,0%
Rents the land	76 56,7%	58 43,3%	134 100,0%
Sharecropping	44 43,1%	58 56,9%	102 100,0%
Tribal authority	1740 41,4%	2464 58,6%	4204 100,0%
State land	60 37,7%	99 62,3%	159 100,0%
Total	5548 100,0%	7007 100,0%	12555 100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.4.5. Tenure status of land by highest level of education and gender

The earlier findings (see table 4.7) revealed that female small-scale farmers possessing secondary education are the most agriculturally involved. Similarly, the results in Appendix 5 depict that being a female small-scale farmer with secondary education increases the probabilities of owning the land because they have the means to do so. These findings support Pinaar and Traut's argument that farming households in South Africa's rural areas typically pursue different livelihood strategies on the basis of the available natural, physical, human, and

financial capital available to them and these are also to a large extent dependent on biophysical and socio-economic conditions.

However, with regards to small-scale farmers utilizing a land for sharecropping purposes, the results show that in 2015, majority of male small-scale farmers with primary education who access land for crop planting with 54.3%, while the percentage decreased in 2018 with 44.0%.

The chi-square test statistic was performed. The findings showed a p-value of 0.000, which does not exceed the standard value of 0.05, in turn denotes a significant relationship between tenure status of land and highest level of education. Moreover, Phi's coefficient was 0.105, signifying a moderate association, and Cramer's was 0.061 denoting a weak association in 2015. On the other hand, by 2018 both values 0.083 and 0.048 presented a weak association.

4.4.6. Tenure status of land by employment status and gender

Concerning tenure status of land and employment status, in Appendix 6, it is apparent that being a female small-scale farmer and economically inactive increases the chances of owning a land, and as well manipulating it for sharecropping. Followed by employed males, correspondingly, the findings depict that they are very much likely to own the land and use it for sharecropping, more than females who also are involved in small-scale farming.

The Chi-square test showed a p-value of 0.000, which does not surpass the cut-off value of 0.05. This means that there is a positive relationship between tenure status of land and employment status. Moreover, Phi and Cramer's V coefficients were 0.154 and 0.109, signifying a moderate association by 2015. Likewise, by 2018, both values 0.151 and 0.106 separately disclosed a moderate relationship.

4.4.7. Tenure status of land by province and gender

With regards to province, the results on Appendix 7 illustrate that male small-scale farmers who are from Limpopo are the most likely to own the land over female counterparts. However, males in small-scale farming originating from the KwaZulu-Natal are the most likely to use the land for sharecropping, who reported a percentage of 59,5% by 2015, and 69,2% by 2018, which shows that there was an increase of small-scale farmers involved in share cropping. In fact, they might use the land for sharecropping because, on Pinaar and Traut (2015)'s point of view, struggling smallholder sector is a direct result of historical patterns of dispossession and impoverishment, which systematically eroded historically successful land-based production systems and livelihoods in South Africa.

The Chi-square test statistic between tenure status of land and province, showed a p-value of 0.000, meaning there is a significant relationship. Furthermore, Phi and Cramer's V coefficients respectively 0.614 and 0.307 showed a strong association by 2015. Correspondingly, 0.596 and 0.298 by 2018 singly presented a strong relationship.

4.4.8. Tenure status of land by geographic type and gender

Appendix 8 displays the findings concerning tenure status of land and geographic type. As it was depicted earlier (see table 4.9) most of household heads agriculturally involved are females situated in non-urban areas, and so are the small-scale farmers. The findings, hence, reveal that most non-urban small-scale farmers who are females tend to own the land. Research done by Pinaar and Traut (2015) stresses that the smallholder sector consists of around 4 million black farmers including women farming in the former homeland areas on 13% of agricultural land, and this is a result of the sad history of South Africa.

However, males who engaged in small-scale farming reported more to be occupying land utilized for sharecropping, with 89,2% and 96,2% respectively. The study has also used a chi-square test to examine the relationship between the tenure status of land and geographic type, with $p=0.000<0.05$, meaning that there is a positive relationship between the tenure status of land and geographic type. More so, Phi and Cramer's V tests showed a relatively strong relationship with 0.313 and 0.318 respectively.

4.5. Differentials in use of agricultural products and stockkeeping

4.5.1. The use of agricultural products and stockkeeping by age group and gender

The agricultural and stockkept products can play a vital role in curbing food insecurity and starvation within the household. The findings depicted in Appendix 9 show that a majority of the sampled population reported amongst male small-scale farmers aged between 12-22 use their farmed products as an extra source of food for the household, with the actual reported percentages 41,4 % and 39,1% respectively. Before, the findings of the study show that a mainstream of household heads who are agriculturally involved are in younger age groups. With that being said, the findings show that household heads in ages 23-33 involved in small-scale farming among females are most likely to use their agricultural products as a main source of food for the household. On the other hand, males tend to use the farm products to generate an extra source of income. The results suggest that females indulge in subsistence agriculture to produce food for the household to survive. On the other hand, males partake in small-scale

farming to accumulate extra income. In South Africa, the main source of income is social welfare grants from the government, specifically old age grants and child support grants (Statistics South Africa, 2013).

Chi-square test statistic was used to assess the relationship between use of agricultural products and stockkeeping with age group showed a p-value 0.000, indicating the statistical evidence to conclude that there is a positive relationship between use of agricultural products and stockkeeping and age group. To measure the strength of the relationship, Phi and Cramer's V tests 0.075 and 0.038 respectively, showed a weak association. In the same way, by 2018, Phi and Cramer's V were 0.068 and 0.034 respectively, denoting a weak relationship.

4.5.2. The use of agricultural products and stockkeeping by population group and gender

The results in Appendix 10 depict that black or African females involved in small-scale farming vastly tend to utilize their agricultural and stockkept products as a main source of food for the household as compared to their male counterparts, the reported percentages respectively were 97,3% by 2015, and by 2018 increased to 98,3%. Additionally, the results altogether show that black small-scale farmers are the most likely to keep and use agricultural or harvested products, more than other racial groups. Emtage saw that in the past and the outcome of the sustainable livelihood approach is designed to improve the livelihoods of poor households by improving their levels of well-being, food security, income, and biophysical environment (Emtage, 2004).

By means of using the chi-square test statistic to assess the relationship between use of agricultural products and stockkeeping and population group, findings showed a p-value of 0.000, meaning there is a significant relationship between use of agricultural products and stockkeeping with population group. Additionally, Phi and Cramer's V was 0.393 and 0.227, denoting a very strong association by 2015. On the other hand, by 2018 Phi's coefficient was 0.259, denoting a very strong association, at the same time as Cramer's V was 0.149, conveying a moderate association.

4.5.3. Differentials in use of agricultural products and stockkeeping by marital status and gender

The results depicted on Appendix 11 show that most of the single males who are in small-scale farming tend to use their agricultural products as extra food for the household, with 77,9% and 77,6% respectively reported. On the other hand, females use the farm products as a main source of food for the household. Followed, by the married small-scale farmers whom amongst them,

both males and females reported to be using agricultural and stockkept products as the main source of income/earning a living in both 2015 and 2018. Rather, males reported higher than females with 38,3% and 33,5% respectively.

Furthermore, by manipulating data to perform Chi-square test statistic to weigh the level of association between use of agricultural products and stockkeeping and marital status, the findings indicate a p-value= 0.000<0.05. Since the p-value of 0.000 does not exceed the cut-off value of 0.05, there is a statistical proof to conclude that there is a significant relationship amongst the variables. The Phi and Cramer's V tests showed a 0.096 and 0.048 independently showed a weak level of association by 2015. However, the 2018 data set indicate that Phi and Cramer's V revealed a weak relationship, with 0.096 and 0.048 respectively.

4.5.4. Differentials in use of agricultural products and stockkeeping by household headship and gender

With regards to use of agricultural products and stockkeeping and household headship. The study results (see table 4.11 below) reveal 74,3% of households headed by male used their farm products as the main source of income/earning a living by 2015. Nevertheless, by 2018, it decreased to 56,6%. With regards to female headed households, as compared to their male counterparts, 55,6% of the sampled population in 2015 used their farm products as an extra source of food for the household. While in 2018, the results showed 57,5% of female headed households using their harvested farm products as a main source of food for the household.

The findings indicate a p-value= 0.000<0.05. So, since the p-value of 0.000 does not go beyond the cut-off value of 0.05, this suggests that it is statistically evident to infer that there is a positive relationship between use of agricultural products and stockkeeping and household headship. The Phi's coefficient (0.124) showed a moderate association and Cramer's V was 0.076, autonomously showing a weak relationship.

Table 4.11: Distribution of use of agricultural products and stockkeeping by household headship and gender

Household headship	Use of agricultural products and stockkeeping (2015)		
	Headed by male	**Headed by female**	Total
As a main source of food for the household	764 51,6%	716 48,4%	1480 100,0%
As the main source of income/earning a living	202 74,3%	70 25,7%	272 100,0%
As an extra source of income	548 60,9%	352 39,1%	900 100,0%
As an extra source of food for the household	6524 44,4%	8171 55,6%	14695 100,0%
As a leisure activity or hobby e.g. gardening	641 60,8%	413 39,2%	1054 100,0%
Total	8679 100.0%	9722 100.0%	18401 100.0%
Use of agricultural products and stockkeeping (2018)			
As a main source of food for the household	640 42,5%	865 57,5%	1505 100,0%
As the main source of income/earning a living	194 56,6%	149 43,4%	343 100,0%
As an extra source of income	559 53,4%	487 46,6%	1046 100,0%
As an extra source of food for the household	5604 44,0%	7145 56,0%	12749 100,0%
As a leisure activity or hobby e.g. gardening	585 54,7%	484 45,3%	1069 100,0%
Total	7582 100,0%	9130 100,0%	16712 100.0%

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.5.5. The use of agricultural products and stockkeeping by highest level of education and gender

The study findings in Appendix 12 show that small-scale farmers possessing secondary education are most likely to use agricultural products and stock keeping as the main source of income/earning a living. In 2015 males reported a 45,2% more than females with 42,6% who used their farm products as a main source of income/earning a living. However, in 2018, females reported higher than males with 47,6%. The results further show that male small-scale farmers in possession of primary education are likely use the farm products as a main source

of income with 40,7% by 2015. However, the 2018 results broaden the evidence that female small-scale farmers typically endure as a group that use farm products as a main source of food to provide for household dwellers. With that said, the study reports female small-scale farmers with secondary education, 41,8% and 42,3% respectively use the farm products as a main source of food for household consumption.

The results are not surprising at all. Across all the South African provinces, there are more female headed households, given the cost of living being too high and all the burden of having to provide for the household entirely lying on females' shoulders. Hence, it makes sense as to why they use agricultural products as the main source of food for their households. Thus, there is a huge necessity for the land constraints that are monotonously prevalent in South Africa to be dissolved. This will become a remedy to at least reduce, and in the long run eliminate poverty cycles that are at a standstill in South Africa.

The findings from the manipulation of the Chi-square test showed a p-value of 0.000. Since the p-value is lower than the standard value of 0.05, this means that there is a significant relationship between use of agricultural products and stockkeeping and highest level of education. Moreover, Phi's coefficient was 0.132, showing a moderate association, and Cramer's value being 0.076 implying a weak association by 2015. However, by 2018 both values 0.083 and 0.048 singly showed a weak association.

4.5.6. Use of agricultural products and stockkeeping by employment status and gender

In this section, the 2015 data set depicts that majority of female small-scale farmers who are not economically active are more likely to use the agricultural product and stock keeping as extra source of food for the household consumption with 69,1%. In 2018 however, the agricultural products and stock keeping was used as main source of food for the household consumption with 58.9%. With regards to male small-scale farmers, the study reports that 58.9% of the participants who were employed used farm product and stock keeping as the main source of income or earning a living. Moreover, the 2018 data set reports surprising results because male participants indicated that they use farm products as a main source of food for the household consumption, with 61.1% (see Appendix 13).

The Chi-square test between the use of agricultural products and stockkeeping and employment status showed a significant relationship. Moreover, the Phi and Cramer's V tests were used to measure the strength of the relationship between use agricultural of agricultural products and stockkeeping with employment status. The Phi's value (0.123) denoted a moderate relationship

between use agricultural of agricultural products and stockkeeping with employment status, on the other hand, the Cramer's V (0.087) showed a weak relationship for 2015. Conversely, for 2018 both Phi and Cramer's V tests showed a weak association between the use of agricultural products and stockkeeping and employment status (see Appendix 18).

4.5.7. Differentials in of use of agricultural products and stockkeeping by province and gender

The results from Appendix 14 depict the use of agricultural products and stockkeeping by province. According to the study done by Akiyemi and Mashunje (2019), KwaZulu-Natal is among then provinces that have slight chances of owning a land and possesses higher prospects of utilizing the land for food production. The findings of the study show that KwaZulu-Natal is an exclusive province among all the other eight provinces, where small-scale farmers in this province use the agricultural products as a main source of food for the household. More so, KwaZulu-Natal outstrips other provinces in relation to usage of agricultural products as a leisure activity or hobby e.g., gardening.

By means of manipulating the chi-square test statistic, findings showed a p-value of 0.000, which does not exceed the standard value of 0.05. Since the p-value is lesser than the standard value of 0.05, this means that there is a significant relationship between use of agricultural products and stockkeeping and province. Moreover, Phi and Cramer's V, showed a strong association with 0.447 and 0.227 respectively in 2015. On the other hand, Phi's coefficient was 0.376, meaning that there is moderate relationship, while Cramer's V value was 0.188, also implying a moderate association by 2018.

4.5.8. The use of agricultural products and stockkeeping by geographic type and gender

Appendix 15 illustrates that most of small-scale farmers originate from non-urban areas. Moreover, the findings show most of female small-scale farmers whom the 88,9% of the sampled population reported to be using agricultural products as the main source of income/earning a living by 2015 and reported an 84,3% of those using the farm products as an extra source of income by 2018.

The Chi-square test statistic, testing a relationship between use of agricultural products and stockkeeping and geographic type, was performed. The findings showed a p-value of 0.000, which does not exceed the standard value of 0.05. Since the p-value is lower than the standard value of 0.05, this means that there is a significant relationship between use of agricultural

products and stockkeeping and geographic type. Moreover, Phi and Cramer's V, only Phi's coefficient (0.161) showed moderate correlation, and Cramer's V was 0.083 singly showing a weak association.

4.6. Logistic regression on land acquisition for food production in South Africa

In addition to the data analysis by means of cross-tabulation and Chi-square test to observe the relationship between land acquisition and socio-demographic characteristics, socio-economic characteristics of small-scale farmers across nine provinces of South Africa, Logistic regression analysis was carried out by dichotomising dependent variables for both 2015 and 2018 GHS data. Hence, Logistic regression statistical analysis was further performed to identify the factors contributing to land acquisition for food production among small-scale farmers in South Africa.

4.6.1. Binary Logistic Regression on factors associated with agricultural activities

In addition to the Bivariate analysis performed in chapter 4, the study further looked at the factors contributing to land acquisition among small-scale farmers in South Africa. In this regard, logistic regression analysis was used. The findings show that the omnibus test of model coefficient was statistically significant with $p=0.000<0.05$ and with *-2 Log likelihood* (1,061). Even though Hosmer Lemeshow was slightly low at $p= 0.007<0.05$, the data was still found to be fit for the model since the model coefficient was statistically significant.

Furthermore, the finding from logistic regression show that for 2015, age was significant with agricultural activities or involvement. The study revealed that, being a small-scale farmer aged between the 23-33 and 34-44 age group for 2015 increase the chances of being involved in agricultural activities by 1,260 and 1,229 times respectively than being 67 years old and above. Looking in 2018, the study found further that this variable was also significant with 1,287 and 1,238 times higher respectively than being 67 years old and above.

Looking at population group, the findings of 2015 show that being coloured or Indian/Asian contribute 1,611 and 2,233 times respectively to be agriculturally involved than being white small-scale farmer. Hence, in 2018, the same variable was also significant. The results show that being coloured or Indian/Asian increase the chances of being involved in agricultural activities by 1,609 and 3,107 times than being white. These are surprising results because one expects African/Black to be involved in agriculture for livelihood.

Marital status was another variable which was significant. The findings in 2015 indicate that being married decrease the chances of being involved in agricultural activities 0.876 times than being single. Moreover, the findings in 2018 show also that the variable was significant, that being married contribute less chances of being involved in agriculture activities by 0.832 times than being single. However, the work of Dlova et al., (2004) and Emaikwu et al., (2001) highlighted that level of education is an important factor that contributes to the agricultural activities' involvement. The findings of the study revealed that having primary education and having secondary education small-scale farmer increase the probability of being involved in agricultural activities 1,146 and 1,305 times respectively than small-scale farmer with tertiary education. In 2018 however, the study indicates that being a small-scale farmer who has secondary education increases the chances of being involved in agricultural activities by 1, 174 times than having tertiary education.

Employment status was significant, and it is indicated by this study in 2015 that both being a small-scale farmer, employed or unemployed, contributes to better chances of being involved in agricultural activities by 1,312 and 1,170 respectively, times higher than those who are not economically active small-scale farmer in South Africa.

Looking at 2018 however, the findings show that the omnibus test of model coefficient was also statistically significant with $p=0.000<0.05$ and with *-2 Log likelihood.* Even though Hosmer Lemeshow was a bit low at $p= 0.00<0.05$, the data was still found to be fit for the model since the model coefficient was statistically significant. The study found that being employed as a small-scale farmer increases the chances of being involved in agricultural activities by 1,226 times than those who are not economically active small-scale farmers. The rest of the provinces were significant when compared to Limpopo province.

Furthermore, the findings of 2015 data set revealed that being a small-scale farmer living in any province of South Africa increase the chances of being involved in agricultural activities than those who are in Limpopo. In 2018 however, only the province of Free State was not significant. Geographic type was significant for both 2015 and 2018. It shows that being a small-scale farmer living in an urban area increases the chances of participating in agriculture by 7,343 and 7,808 times than being in rural areas. These are controversial results because it is rather expected to see more small-scale farmers in rural areas involved in agricultural activities. Lele and Agarwal (1989) stress that subsistence farming is found in urban areas though the expectation is high in rural areas.

Table 4.12: The factors associated with agricultural activities among small-scale farmers in South Africa

Characteristics	2015				2018				Difference in odds ratios (2018-2015)
	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	
Age group		51,712	0,000			69,218	0,000		
12-22	0,02	0,047	0,829	1,015	-0,023	0,107	0,743	0,977	-0,038
23-33	0,231	11,184	0,001	1,260	0,252	13,488	0,000	1,287	0,027
34-44	0,206	9,204	0,002	1,229	0,214	10,014	0,002	1,238	0,009
45-55	-0,008	0,016	0,901	0,992	0,044	0,455	0,500	1,045	0,053
56-66	0,005	0,006	0,941	1,005	-0,081	1,788	0,181	0,922	-0,083
67+ (Ref)									
Population group		61,618	0,000			53,859	0,000		
African/Black	0,030	0,169	0,681	1,031	0,114	2,194	0,139	1,120	0,089
Coloured	0,477	24,155	0,000	1,611	0,475	20,146	0,000	1,609	-0,002
Indian/Asian	0,803	24,397	0,000	2,233	1,134	34,135	0,000	3,107	0,874
White (Ref)									
Marital status		20,832	0,000			35,622	0,000		
Married	-0,132	12,145	0,000	0,876	-0,184	22,527	0,000	0,832	-0,044
Divorced	-0,073	0,422	0,516	0,929	-0,147	1,768	0,184	0,863	-0,067
Separated, but still legally married	0,119	0,701	0,402	1,126	-0,009	0,004	0,950	0,991	-0,135
Widowed	0,075	1,573	0,210	1,078	0,096	2,466	0,116	1,101	0,023
Single (Ref)									
Household headship									
Headed by male	-0,04	1,700	0,192	0,961	0,009	0,075	0,784	1,009	0,048
Headed by female (Ref)									
Highest level of education		43,871	0,000			33,631	0,000		
No education	0,050	0,474	0,491	1,051	-0,085	1,277	0,258	0,918	-0,133
Primary education	0,136	5,684	0,017	1,146	-0,010	0,028	0,867	0,990	-0,156
Secondary education	0,267	29,130	0,000	1,305	0,160	9,542	0,002	1,174	-0,131
Tertiary education (Ref)									
Employment status		53,727	0,000			29,390	0,000		
Employed	0,271	51,888	0,000	1,312	0,204	27,561	0,000	1,226	-0,086
Unemployed	0,157	12,168	0,000	1,170	0,018	0,168	0,681	1,018	-0,152
Not economically active (Ref)									
Province		1678,546	0,000			1239,353	0,000		
Western Cape	1,330	234,020	0,000	3,780	1,687	253,201	0,000	5,404	1,624
Eastern Cape	-0,084	3,614	0,057	0,920	-0,168	14,019	0,000	0,845	-0,075
Northern Cape	0,854	128,520	0,000	2,349	1,031	154,816	0,000	2,804	0,455
Free State	0,176	7,865	0,005	1,192	-0,100	2,376	0,123	0,905	-0,288
KwaZulu-Natal	0,596	205,395	0,000	1,814	0,228	29,308	0,000	1,256	-0,558
North West	1,610	661,958	0,000	5,002	1,520	492,110	0,000	4,571	-0,431
Gauteng	1,663	635,732	0,000	5,278	0,982	254,533	0,000	2,669	-2,609

Mpumalanga	0,312	39,954	0,000	1,366	0,228	21,516	0,000	1,256	-0,110
Limpopo (Ref)									
Geography type									
Urban	1,994	3505,273	0,000	7,343	2,055	3389,210	0,000	7,808	0,465
Non-urban (Ref)									
Constant	**-24,240**	**0,000**	**0,995**	**0,000**	**-24,000**	**0,000**	**0,996**	**0,000**	-

Note: Ref: reference category

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.6.2. Binary logistic regression on factors associated with land tenure

This study investigated the factors influencing land ownership among small-scale farmers across South Africa. The findings from 2015 data set show that the omnibus test of model coefficient was statistically significant with *p=0.000<0.05* and with *-2 Log likelihood.* Even though Hosmer Lemeshow was a bit low at *p= 0.165>0.05*, this is an indication that the data was found to be fit for the model. Hence, age was one of the contributing factors to land ownership among African female small-scale farmers. The findings indicate that all age groups were significant except the 56-66 age group. The reason might be that small-scale farmers in that age group tend to inherit their land to their descendent because they possibly have no energy to do farming anymore. The same results were obtained except 45-55 and 56-66 age groups which were not significant.

Marital status was significant in 2015. The data show that being married or being widowed increases the chances of owning land by 1,396 and 1,529 times than being single. This makes sense since, for example, married women obtain land from male kin such as a husband or a brother. Moreover, this is also possible because a widowed woman inherits land from the late husband. In 2018, marital status was significant as well, and all the categories were significant.

Level of education was significant, and the findings from 2015 data set show that being a small-scale farmer with secondary education decreases the chances of owning land by 0,759 times than those who have tertiary education. The same was observed in 2018, where having secondary education contributes less chances of owning a land by 0.791 times than those who have tertiary education.

Employment was only significant in the 2018 data set. The findings revealed that being employed small-scale farmer gives the opportunity to own a land by 1,185 times higher than somebody who is not economically active. However, it was indicated that being an unemployed small-scale farmer decreases the likelihood of owning a land by 0.356 times than those who

are not economically active. This might be true because somebody who does not have another source of income, especially from a salary, find it difficult to have funds to buy land for farming.

The study shows further that being a small-scale farmer living in any province of South Africa increases the likelihood of owning a land except Northern Cape for 2015. Nonetheless, the 2018 data set shows that the omnibus test of model coefficient was statistically significant, with $p=0.000<0.05$ and with *-2 Log likelihood.* Hosmer Lemeshow was statistically significant as well with $p= 0.904>0.05$, meaning that the data was found to be perfectly fit for the model. Thus, small-scale farmers have higher chances of owning land in any province of South Africa. Looking at geographic type, being a small-scale farmer in urban areas decreases the likelihood of owning a piece of land for subsistence farming and for food production, compared to those who are in rural areas. Mokgope (2000) supports this argument, showing that small-scale farmers in urban areas only use their backyard to grow some crop to supplement off-farm income. Furthermore, Cousins (2000) notes that the government adopted a willing buyer and willing seller approach for the purpose of redistribution which has made the land expensive in urban areas, making it difficult for the population to acquire it.

Table 4.13: The factors contributing to land ownership among small-scale farmers in South Africa

Characteristics	2015				2018				Difference in odds ratios (2018-2015)
	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	
Age group		36,204	0,000			36,786	0,000		
12-22	0,794	28,685	0,000	2,211	0,738	24,165	0,000	2,091	-0,120
23-33	0,615	17,638	0,000	1,850	0,639	18,708	0,000	1,894	0,044
34-44	0,478	11,347	0,001	1,614	0,459	10,246	0,001	1,582	-0,031
45-55	0,232	3,024	0,082	1,261	0,189	1,977	0,160	1,209	-0,053
56-66	0,170	1,776	0,183	1,185	0,050	0,161	0,688	1,051	-0,134
67+ (Ref)									
Population group		3,118	0,374			1,154	0,764		
African/Black	0,081	0,073	0,787	1,084	0,273	0,949	0,330	1,314	0,230
Coloured	-0,591	2,303	0,129	0,554	0,214	0,214	0,644	1,239	0,686
Indian/Asian	0,316	0,283	0,595	1,372	-0,099	0,015	0,901	0,906	-0,466
White (Ref)									
Marital status		18,966	0,001			41,261	0,000		
Married	0,333	14,694	0,000	1,396	0,415	21,601	0,000	1,514	0,118
Divorced	0,370	2,221	0,136	1,447	0,912	14,593	0,000	2,489	1,042
Separated, but still legally married	0,482	2,646	0,104	1,619	1,241	16,666	0,000	3,457	1,838
Widowed	0,424	11,431	0,001	1,529	0,475	13,902	0,000	1,609	0,080
Single (Ref)									
Household headship									
Headed by male	-0,077	1,478	0,224	0,926	0,037	0,320	0,572	1,038	0,112
Headed by female (Ref)									
Highest level of education		14,872	0,002			9,741	0,021		
No education	-0,107	0,487	0,485	0,898	-0,414	6,382	0,012	0,661	-0,237
Primary education	-0,014	0,011	0,915	0,986	-0,129	0,877	0,349	0,879	-0,108
Secondary education	-0,276	5,368	0,021	0,759	-0,235	3,517	0,061	0,791	0,032
Tertiary education (Ref)									
Employment status		0,823	0,663			30,985	0,000		
Employed	-0,062	0,623	0,430	0,940	0,170	4,557	0,033	1,185	0,245
Unemployed	0,023	0,054	0,816	1,023	-0,447	18,829	0,000	0,639	-0,384
Not economically active (Ref)									
Province		1699,826	0,000			1313,481	0,000		
Western Cape	1,823	24,904	0,000	6,187	-1,052	4,037	0,045	0,349	-5,838
Eastern Cape	2,694	1181,471	0,000	14,786	2,229	752,375	0,000	9,294	-5,492
Northern Cape	-0,836	2,481	0,115	0,433	-1,453	5,650	0,017	0,234	-0,200
Free State	-1,728	30,331	0,000	0,178	-1,031	29,453	0,000	0,356	0,179
KwaZulu-Natal	1,190	273,537	0,000	3,288	0,918	160,856	0,000	2,504	-0,785
North West	-1,861	9,888	0,002	0,156	-2,057	11,893	0,001	0,128	-0,028
Gauteng	0,916	14,972	0,000	2,499	-0,476	3,788	0,052	0,621	-1,878
Mpumalanga	-1,119	83,576	0,000	0,327	-2,349	192,616	0,000	0,095	-0,231

Limpopo (Ref)									
Geography type									
Urban	-2,356	451,476	0,000	0,095	-1,803	274,259	0,000	0,165	0,070
Non-urban (Ref)									
Constant	**-1,720**	**25,839**	**0,000**	**0,179**	**-1,528**	**22,442**	**0,000**	**0,217**	-

Note: Ref: reference category

Source: Author's own calculations from 2015 and 2018 General Household Survey data

4.6.3. The factors associated with use of agricultural products and stockkeeping

When examining the factors influencing the use of agricultural products and stock-keeping as the main source of food for consumption in the household, Logistic regression analysis was utilised. Looking at the 2015 data set. The findings show that the omnibus test of model coefficient was statistically significant with *p=0.000<0.05* and with *-2 Log likelihood.* Hosmer Lemeshow was also statistically significant with *p= 0.1657>0.05*, which means that the data perfectly fits the model.

Being a small-scale farmer aged between 34-44 years old decreases the likelihood of using agricultural products or stock keeping as a main source of food for the household to survive by 0,695 times than those who are in the age between 67 and above. This might be true in a sense that small-scale farmers in that age are employed, and they only do farming as a supplement to their income earning. However, 2018 data set shows that small-scale farmers of all ages do not need to rely on agricultural products and stock keeping as main source of food for the household. They possibly rely on the income from salaries or wages to get food for the household. These findings are supported by Louw and Lulama, (2015) who saw that social grants, specifically old age pensions and child support grants, play an important role in determining livelihood strategies of many smallholder farmers in the former homeland regions of South Africa.

Looking at population group, the study found that it was significant. The findings indicate that being black/Africa small-scale farmer decreases the likelihood of using agricultural products and stock keeping as the main source of food for household consumption 0.448 times lower compared to white population. This might be true because the majority of people who own farms are white. This is due to the sad history of South Africa during apartheid when black people were dispossessed of their land and were moved to the homelands. Looking at population group in 2018, the same results were observed among the black population group. However, the data shows that being a coloured small-scale farmer increases the chances of

using agricultural products and stock keeping as the main source of food for consumption in the household.

Marital status was only significant in the 2018 data set. It shows that being a divorced small-scale farmer increases the chances of using the agricultural products and stock keeping as the main source of food for livelihood, 2.696 times compared to those who are single. The reason might be that divorced people in rural areas are more involved in agriculture and they are less likely to diverse income. Moreover, households headed by males are less likely to use the agricultural products and stock keeping for food consumption by 0.809 times lower, compared to the households headed by females. According to Nyirasafari (2009), the reason might be that female headed households living in rural areas are more likely to be involved in small-scale farming, compared to male heading household.

With regard to level of education in 2015, the study shows that having no education or secondary education decreases the likelihood of using the agricultural product and stock keeping as main source of food as a livelihood strategy by 0.593 and 0.682 times compared to those who have tertiary education. According to Tsegaye, (2017), this makes sense because this population does not even have small holdings or gardens to practice the agricultural activities. Hence, the same situation was observed in the 2018 data set, where having no education, primary education, and secondary education negatively influences the likelihood of using the agricultural products and stock keeping as main source of food for household consumption.

Nevertheless, the data set of 2015 shows that being unemployed increases the chances of using the agricultural products and stock keeping as the main source of food for household use by 1,206 times than those who are not economically active. However, the 2018 data set shows otherwise. The findings indicate that being an employed small-scale farmer increases the chance of using the agricultural products and stock keeping as main source of food for consumption in the household by 1.632 times than those who are not economically active.

The study revealed that province was significant for both 2015 and 2018 data sets. The findings show that being a small-scale farmer living in another province in South Africa decreases the chances of using the agricultural products and stock keeping as a main source of food for the household to survive compared to those who are in Limpopo province. In addition, being a small-scale farmer living in an urban area decreases the likelihood of using the agricultural products and stock keeping as the main source of food for household consumption compared

to those in rural areas. In addition, the findings show that the omnibus test of model coefficient was statistically significant with *p=0.000<0.05* and with *-2 Log likelihood.* Hosmer Lemeshow was also significant with p= *0.904>0.05*. This is proof that the model perfectly fits the data.

Table 4.14: The of use of agricultural product and stock keeping as main source of food for the household

Characteristics	2015				2018				Difference in odds ratios (2018-2015)
	B	Wald	Sig.	Exp(B)	B	Wald	Sig.	Exp(B)	
Age group		14,136	0,015			20,287	0,001		
12-22	-0,046	0,056	0,812	0,955	-0,435	5,038	0,025	0,648	-0,307
23-33	-0,303	2,555	0,110	0,738	-0,553	8,129	0,004	0,575	-0,163
34-44	-0,364	3,899	0,048	0,695	-0,758	16,401	0,000	0,469	-0,226
45-55	-0,301	3,025	0,082	0,740	-0,621	12,212	0,000	0,538	-0,202
56-66	0,055	0,098	0,754	1,056	-0,363	4,687	0,030	0,696	-0,360
67+ (Ref)									
Population group		12,694	0,005			13,152	0,004		
African/Black	-0,803	9,165	0,002	0,448	-0,609	4,285	0,038	0,544	0,096
Coloured	0,082	0,043	0,836	1,085	1,550	3,990	0,046	4,712	3,627
Indian/Asian	19,106	0,000	0,997	198375418,21	-0,077	0,016	0,900	0,926	-198375417,29
White (Ref)									
Marital status		3,374	0,497			5,609	0,230		
Married	-0,092	0,752	0,386	0,912	0,060	0,300	0,584	1,062	0,150
Divorced	0,425	1,103	0,294	1,529	0,992	4,441	0,035	2,696	1,167
Separated, but still legally married	0,321	0,451	0,502	1,378	0,344	0,606	0,436	1,410	0,032
Widowed	-0,155	0,862	0,353	0,857	-0,057	0,117	0,732	0,945	0,088
Single (Ref)									
Household headship									
Headed by male	-0,212	6,917	0,009	0,809	0,075	0,835	0,361	1,077	0,268
Headed by female (Ref)									
Highest level of education		16,148	0,001			8,857	0,031		
No education	-0,523	6,546	0,011	0,593	-0,665	8,802	0,003	0,514	-0,079
Primary education	-0,114	0,399	0,528	0,892	-0,480	5,773	0,016	0,619	-0,274
Secondary education	-0,382	5,468	0,019	0,682	-0,450	5,904	0,015	0,638	-0,045
Tertiary education (Ref)									
Employment status		3,977	0,137			22,825	0,000		
Employed	0,187	3,657	0,056	1,206	0,489	22,745	0,000	1,631	0,424
Unemployed	0,009	0,006	0,940	1,009	0,196	3,021	0,082	1,216	0,208
Not economically active (Ref)									
Province		375,641	0,000			291,618	0,000		
Western Cape	-2,281	28,425	0,000	0,102	-0,877	0,694	0,405	0,416	0,314
Eastern Cape	-1,690	56,345	0,000	0,184	-1,762	76,290	0,000	0,172	-0,013

Northern Cape	-2,138	49,353	0,000	0,118	-2,010	35,109	0,000	0,134	0,016
Free State	-2,581	110,517	0,000	0,076	-2,522	116,127	0,000	0,080	0,005
KwaZulu-Natal	-3,071	207,841	0,000	0,046	-2,513	168,738	0,000	0,081	0,035
North West	-1,327	15,742	0,000	0,265	-1,645	31,740	0,000	0,193	-0,072
Gauteng	-3,121	152,279	0,000	0,044	-3,439	219,615	0,000	0,032	-0,012
Mpumalanga	-2,421	115,492	0,000	0,089	-2,046	95,821	0,000	0,129	0,040
Limpopo (Ref)									
Geography type									
Urban	-0,629	40,887	0,000	0,533	-0,045	0,165	0,685	0,956	0,423
Non-urban (Ref)									
Constant	**6,195**	**252,620**	**0,000**	**490,262**	**5,716**	**202,429**	**0,000**	**303,728**	-

Note: Ref: reference category

Source: Author's own calculations from 2015 and 2018 General Household Survey data

CHAPTER 5: DISCUSSION OF THE FINDINGS

5.1. Introduction

This study aimed at examining the relationship between land acquisition for food production across the nine provinces of South Africa. It explored how small-scale farmers' socio-demographic, socio-economic, and locational characteristics influence land access to produce food for household survival. Thereto, this chapter discusses the results in Chapter 4 to give an understanding as to how the research questions were articulated and the hypotheses were tested with the research design. The discussions are put in order to disclose the relationship between small-scale farmers' characteristics and land and agriculture-related variables.

The study proposes that small-scale farmers' access to land is determined by their characteristics. To confirm this general hypothesis, the study, firstly, used univariate analysis to explore the data. Secondly, the study used cross-tabulation to see the patterns of the percentages in two-way tables. Pearson Chi-square test statistic was used to measure the relationship between small-scale farmers' characteristics and land related variables. Thirdly, the study used multivariate analysis to identify the factors that contribute to land acquisition for farming across all nine provinces of South Africa. The SPSS software version 27 and Excel were used to analyse the data. To analyse the data, the study used the 2015 and 2018 GHS data sets for the purpose of comparison.

5.2. Major procedures followed in research design

The study used the research design and methodology drawn in Chapter 3. More so, the study was strictly quantitative in nature and used both descriptive and inferential statistics for analysis. The secondary data was used, from the 2015 and 2018 General Household Survey collected by Statistics South Africa by means of survey methodology. The relationship between the dependent and independent variables was examined. The independent variables involved were socio-demographic, socio-economic, and locational variables. On the other hand, agriculture variables were used as dependent variables in the analysis.

Additionally, with regards to analysis groundwork, SPSS software version 27 was utilised to explore the data. Furthermore, the analysis was performed by making use of the Univariate analysis to explore the data. The Bivariate analysis by means of cross-tabulation and Chi-square test statistic were used to test the relationship between the dependent and independent variables; Phi and Cramer's V tests were performed to assess the strength of association.

However, the Multivariate analysis such as Logistic regression was manipulated to draw attention to factors contributing to land acquisition for food production. To accomplish logistic regression, dependent variables were re-coded to a dichotomous variable. Moreover, the significance of the study lies within highlighting fundamental changes of the land acquisition gap for the year 2015 and 2018 among small-scale farmers in the nine provinces of South African.

The theoretical framework for the study covered Livelihood Sustainable Framework's Theory. The Reason was the fact that there was no unified theory of why there are dissimilarities among small-scale farmers who acquire land for food production. According to Ellis (1998), agriculture plays a significant role in diversification alternatives, and most certainly stimulate income diversity. This theory, thus, successfully explains the population that is likely to agriculturally be involved for subsistence and diversification of income streams for their households. Moreover, the study identified all the factors that contributed to explaining the differential in tenure ownership between males and females who are small-scale farmers.

5.3. Distribution and composition of small-scale farmers

At the initial stage, chapter 4 showed the size and composition of small-scale farmers from the 2015 and 2018 General Household Survey. Demographic and socio-economic variables, such as age group, population group, marital status, level of education, household headship, employment status, province, and geographic type were explored. By means of Univariate analysis, the study discovered that most of small-scale farmers were African/black, followed by Whites. Coloured and Indian/Asian small-scale farmers were less likely to be agriculturally involved. The study of Von Fintel and Pienaar (2016) supported the findings, indicating that there is 4 million allocated among the traditionally African/Black involved in small-scale farming in homeland areas, and only producing approximately 5% of farming productivity, contrasted to the other 35 000 (traditionally white) commercial farmers who produce the rest. More so, most of the small-scale farmers are concentrated in Limpopo.

Though it is impossible to verify empirically the share produced by women because agriculture is usually a venture among household members and involves a range of resources and inputs that cannot be readily assigned by gender, the contribution of women to agricultural and food production is clearly significant. With regards to gender, the results of the study indicate a higher percentage of females involved in agricultural activities compared to males. This is in harmony with the findings by Zongho et al. (2020) that men are still more likely to indulge in off-farm

activities such as seeking employment in metropolitan areas. On the other hand, women in rural dwellings are left as heads of the household and indulging in small-scale farming to produce food, which is an easy road to take to curb poverty and food insecurity. Though the literature is muchly silent regarding the marital status, the study shows that single people are the mostly reported to be involved in small-scale farming for subsistence food production.

This study reported further that young people are highly involved in agriculture in their youthful ages. The rate is believed to be highest among the youth and rural dwellers. Moreover, the study found that most of the small-scale farmers in both 2015 and 2018 have secondary education, and males were more favoured in employment than females. However, the majority proved to be economically inactive, with the majority originating from non-urban settlements. Mokgope (2000) proclaims that non-urban dwellers are rich in land which is a resource to fight poverty cycles within household structures.

5.4. The relationship between agricultural activities and the characteristics of small-scale farmers.

This study assumes that acquiring land for food production is influenced by personal characteristics. Therefore, some of the socio-economic, demographic variables have been found to be relative to the differentials in land acquisition among males and females who practice small-scale farming.

5.4.1. Differentials in agricultural activities and age group

The study by Oluwatayo (2009) reported that people in younger ages are very likely to indulge in in livelihood activities. To examine the relationship between the agricultural activities and age, the hypothesis was formulated as; "*younger household heads are more likely to be involved in agricultural activities*". What the results revealed confirmed the hypothesis, that male small-scale farmers who were in younger age groups 12-22, were reported to be more involved in agricultural activities than those in older ages. Therefore, the hypothesis formulated in this regard was supported by the findings that there is a relationship between small scale farmers and agricultural activities. This argument is supported by Adey et.al (2000) who notes that agriculture is often perceived as the occupation of the poor, and young people have no desire to be involved. In a family farming household, usually only the younger children will assist, as the adolescents consider the tasks too menial.

The results from the study support the study by Aliber and Hart (2009) which found out that the number of young people who are agriculturally involved in small-scale farming for subsistence production is more than the one in older ages, and it decreases with age. Adey et al (2000) stresses that children, especially girls, are taken out of school to help with agricultural tasks, as less labour is available for fieldwork when a family member is sick.

However, the study by Zongho et al., (2020) found the opposite of the results in the study, that older farmers are active in agricultural activities than young people. Possibly, the youth is less absorbed in agricultural activities and see farming as an occupation for the older generation.

5.4.2. Agricultural activities and small-scale farming by population group

The population group variable is significant to the study, given the South African history that was set apart by racial division. Hence, reviewing the structural changes on land acquisition gap is important as to highlight the coexisting dissimilarities among males and females in general and within each of the population groups. This enlightens policy makers of the effectiveness/ineffectiveness of the land policies that by this time exist and the necessity to foster new policies that will be solid enough to get rid of inequalities and land constraints. The results answered the question; *Which population group is the most likely to be involved in agricultural activities for food production?* This was formulated to measure the relationship between population group and agricultural activities involvement among small-scale farmers to produce food for household consumption. As a result, the Chi-square test statistic indicates that the population group of a small-scale farmer is associated with agricultural involvement. This means that the involvement of a small-scale farmer depends on the population group they belong to.

In this regard, the study found that Blacks/Africans are more agriculturally involved in small-scale farming to produce food for household consumption. This could be explained by the findings from the work of Von Fintel and Pienaar (2016) that Black/African are small-scale farmers because they are landless, poor, perform agricultural activities on very small pieces of (communal) land for household subsistence. However, it can be mentioned that most of the farmers are reliant on social grants payments from the government's social protection programme. Furthermore, Black/Africans have been completely affected by poverty because of the Land Acts of 1913 where the black population was forcibly removed from their land and moved into homeland. This sad history of South Africa led Black/African population in a deep poverty.

5.4.3. Agricultural activities and small-scale farming by marital status

This section focuses on the relationship between agricultural activities and marital status. According to the study done by Mdlalose (2016), an individuals' marital status does not certainly impact on their farming choices. The hypothesis formulated was "*marital status is one of the factors contributing to a household head to practice farming*". This hypothesis was supported by the findings that single males are more likely to be involved in agricultural activities in South Africa compared to those who are single females, divorced or separated. Hence, the Chi-square test statistic showed that there is a significant relationship between the variables, though the relationship was not strong enough.

5.4.4. Agricultural activities by household headship

The objective in this section was to examine whether household headship is related to the farming practice. The hypothesis formulated was "*There is a relationship between agricultural activities and household headship*". In this regard, the results from the Chi-square statistical test indicate that there is an association between household headship and the agricultural involvement. However, Phi and Cramer's V that were used to measure the strength of this relationship indicated a very weak relationship for both 2015 and 2018.

The results showed that female headed households are more involved in agricultural activities compared to male headed households, and there was percentage increase that was reported from 2015 to 2018. According to Thamaga-Chitja and Morojele (2014) women do most of the fruitful work in small-scale agriculture due to their traditional and cultural roles, to curb poverty in a household and in society at large (Abdu-Raheem and Worth, 2011). In general, this study holds essence that there are more women agriculturally involved, who are small-scale farmers and who use the land for subsistence production. The international development community has recognized that agriculture is an engine of growth and poverty reduction in countries where it is the main occupation of the poor. Yet, the agricultural sector in many developing countries, including South Africa, is underperforming in part, because women who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers, and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources (SOFA Team and Doss, 2011).

5.4.5. Agricultural activities and highest level of education

This section is based on the discussion between highest level of education and agricultural activities. Education plays a vital role in decision-making of the household. Small-scale farmers who are educated are bright enough to read, write, understand information provided by different institutions. Consequently, this enables them to weigh any possible risks involved and make informed decisions in relation to land acquisition processes and/or policies. Moreover, educated people would understand how the land should be used to produce food for household consumption. In this regard, a hypothesis: "*The household involvement in the agricultural activities differ by level of education*" was formulated and confirmed by the findings from Chi-square test statistic which showed a significant relationship between these two variables. Phi and Cramer's V showed a very moderate association between the variables.

The study findings show that the majority of small-scale farmers in agricultural activities possessed secondary education, and there were more females agriculturally involved. The study by Mayowa (2015) also discovered that most of small-scale farmers hold secondary education qualifications. In contrast, the study by Tshuma (2014) reported a significant number of both males and females in small-scale farming sector, though, most of them do not have formal education.

Tshuma, (2014) further indicated that those in rural settlements who have acquired formal education scarcely involve themselves in farming practices. They rather, prefer to seek off-farm employment than staying in the homesteads to practice agricultural activities. Therefore, the hypothesis which was formulated in this regard was successfully supported by the findings. Undeniably, education is one of the determinants of agricultural involvement as supported by Francis and Hoddinott, (1993).

The results make much sense by indicating that the small-scale farmers who possessed secondary level education were most likely to indulge in farm activities. The possible explanation is that a person who has secondary level of education is likely to have a clarity on modern technologies in reaction to farm-related aspects. These findings are supported by Adey et, al (2000) who note that in the small-scale farming sector, there is a farmer who is well established and active, who assists other farmers with advice, seeds, and plants. That established small-scale farmer facilitates the farmer-to-farmer learning activities, promotes an ecological approach to production, empowers these farmers with skills to increase their production and assist them with the acquisition of plants, seeds and animals.

5.4.6. Agricultural activities and employment status

In this section, the hypothesis was formulated: "*Agricultural involvement differs by employment status*." Based on the study findings, females who are not economically active are more involved in agricultural activities than employed and unemployed females. With respect to this, data analysis was carried out to examine whether small-scale farmers' employment status determine farm practice. The Pearson Chi-square test statistic confirmed that there is an association between the two variables. The strength of association was moderate in both years of 2015 and 2018.

Given that there are more female headed households in South Africa, the majority of them are involved in the agricultural activities to supplement the household for food security (Ogunlela and Mukhtar, 2009; Jili and Masuku, 2017). Generally, most of the women practice small-scale farming, especially in rural areas to earn a living (Jili and Masuku, 2017). To some extent, the high level of involvement of women in agricultural activities is because men migrate to urban areas to seek employment opportunities. Women, therefore, who remain behind 'keeping the fire burning' resort to agricultural activities to support the families. In addition, women in rural areas lack technical skills, making crop production one of the activities they can perform. Most of the poor and marginalized population reside in the rural areas and they are dependent on agricultural practices for their livelihoods (Acha, 2014).

However, the findings revealed that a small proportion of employed males was involved in agricultural activities. This was supported by Adey et.al (2000) who revealed that in small-scale farmers households, usually at least one family member works away from home, within the community, within another community or in an urban centre. Up to 48 per cent of rural households in South Africa are dependent on wages, with approximately half of South Africans earning less than ZAR1000 per month.

5.4.7. Agricultural activities and province

The spatial setting such as province, where small-scale farmers live is an important factor to consider when looking at agricultural involvement in South Africa since some provinces in South Africa are well-off than others. In this section, the purpose is to examine the relationship between the province and the agricultural involvement. In this regard, a hypothesis was formulated: "*The household involvement in the agricultural activities differ by province*. The study confirms that female small-scale farmers from Limpopo were more agriculturally involved than other provinces in 2015. However, the study shows further that, in 2018 female

small-scale farmers who were mostly involved in agricultural activities were highly represented in Limpopo and KwaZulu-Natal respectively.

These findings were supported by the Chi-square test statistic results. The study found an association between these two variables in both 2015 and 2018. This means that there is a significant relationship between province and agricultural activities. The Phi and Cramer's V results show that the relationship between those two variables is strong. Hence, in the following section, geographic type was used as another factor which has an impact on agricultural involvement.

5.4.8. Agricultural activities and geographic type

Most of small-scale farmers are based in rural or non-urban areas, in line with the work of Mokgope (2000) and Jazairy et al., (1992) which found out that a land is an asset which rural lives could utilize to diversify their livelihoods, and consequently could deal with the chronic issue of food insecurity and rural poverty. Similarly, subsistence food production plays a significant role in plummeting rural poverty and food insecurity (Lele and Agarwal, 1989). The hypothesis formulated in this regard is "*Geographic type is one of the factors contributing to agricultural activities involvement among small-scale farmers*". With regards to geographic type, the study indicates that females who are located in non-urban areas are more likely to be involved in agricultural activities than those living in urban areas for livelihood.

5.4.9. Tenure status of land by age group

The research objective in this section was to examine whether there is a relationship between age of the small-scale farmer and land tenure status among small scale-farmers. The hypothesis formulated was: "*A relationship exists between small-scale farmers' age and land tenure*." The results from the Chi-square statistical test reveal that there is a significant relationship between age and tenure status of land. Moreover, the Phi and Cramer's V tests showed a weak association between these two variables. This means that land tenure is influenced by the age of a small-scale farmer. The findings of the study showed that small-scale farmers who are male in ages 12-22 use the land for sharecropping more than their female counterparts in both years. The literature shows that female access land through male kinship. Women are mostly marginalised on the land market because they have to depend on males in order to get land.

5.4.10. Tenure status of land and by population group

During apartheid, policies and laws were in place that restricted land ownership and trade by black people, and greatly limited commercialisation amongst black farmers. While there was a supportive extension service for small-scale farmers in the former homelands, this was always afforded a low priority in relation to South Africa's overall (Ade et al, 2000). The acquisition of land in South Africa is a sensitive topic. The expropriation of land under the apartheid regime created unequally balanced land ownership in favour of the White minority (Hoffmann & Dilizo; 2018).

One of the objectives of the study was to identify whether there are differentials in terms of tenure status of land by population group. Hence, the research question was formulated: "*Which population group is the most likely to acquire land for food production?*". When the Pearson Chi-square test statistic was used to measure the relationship between these two variables, the study found that Blacks/Africans were owning land more than other racial groups. However, the majority of the sampled population accesses land regulated by tribal authority. The findings reported further that, black small-scale farmers are more likely to access land through tribal-owned land. Given that there are more households headed by females, Pinaar and Traup (2015) reported that households headed by females partake in agricultural activities to provide food for the household, which is usually bought from the formal market bureau.

Some households in rural areas depend on agriculture to curb food insecurity and poverty. The literature has indicated that most of small-scale farmers access land through tribal authority. According to the study of Aliber (2005) agricultural output contributes about 15% of the overall household income among Black/African households. However, in the poorest quintile, the contribution remains at 35%. However, there has been so much agricultural evolvement because later on, Aliber and Hart (2009) on their work which focused on "Subsistence farming as a strategy to address rural food security" reported that only 4 million-strong (traditionally black African) small-scale sector in homesteads produces about 5% of agricultural output, in association to the 35 000 (traditionally white) commercial farmers who produce the rest. More so, Baiphethi (2009) reported that South Africa was among the countries that are undergoing de-agriculture. The results, therefore, show that blacks are more infused in small-scale farming, while whites occupy large hectares of land that enable them to indulge in commercial farming.

5.4.11. Tenure status of land and marital status

This study also examined the differential of household heads who acquire land for food production by looking at marital status. According to Munhenga (2014), marital status of the household head is a significant factor that can determine household head's choices of livelihood strategies, including land. The objective was to find out whether small scale farmers' marital status influences the land tenure. The hypothesis "*Marital status influences land tenure of the head of the household*" was formulated. The study findings show that single males who are small-scale farmers are more likely to own the land more than those who are either married, widowed, separated, or divorced females. To indorse this, a Chi-square statistical test was manipulated to test the hypothesis. The results corroborate a significant relationship between land tenure status and marital status. The strength of this association was measured and found very weak in both years.

In South Africa, the most channel through which women access land is through the tribal-owned land. Kimani (2008), reports about women's struggles to secure tenure security and or land rights. Research stresses that, in South Africa, a woman may possibly have accessibility to her father's land before marriage. However, a married female would then get access to land from kinship male such as husband or from the extended family. In cases where a husband may pass away, his land is passed on to male children. They might have had or to male in-laws if there were none (Kimani, 2008). Land tenure and rights are typically facilitated by males: first the fathers, then the sons and finally, husbands and/ or their male relatives. Therefore, the results are not surprising because males who are single are likely to own the land, then the land is passed on to them.

5.4.12. Tenure status of land by household headship

Household headship is an important feature in this study of land acquisition for food production. In the context of this study, it is hypothesised that "*The households headed by females are more likely to access land through ownership"*. The results support the hypothesis as they show that there are more female small-scale farmers heading household in 2015 owning the land compared to males. The land ownership among female small-scale farmers increased in 2018.

The results clearly show that women are heading households, and play a crucial role as agriculturalists, food producers, and providers. However, women are frequently not considered within African customary societies where males are more preferred as heads of household.

Rural women work on the land to practice farming for household subsistence, and in many cases having no control over the decisions regarding land regulation or household resources generated by their efforts (Nadasen, 2012).

Moreover, Serrat (2008) in Nadasen (2012) notes the responsibility of dealing with household food shortage falling on their shoulders. There is another problem which is an insufficient control and use of land, leading to food insecurity due to gender discrimination. Women's insecure access to land hinders their ability to take advantage of economic opportunities and reduce household food insecurity (Songelwa, 2009).

5.4.13. Tenure status of land by highest level of education

The study by Zongho et al., (2020) on the determinants of small-scale farmers' choice and adaptive strategies in response to climatic shocks found out that the level of education can help to raise or secure the capital to purchase land. It is assumed that a small-scale farmer with high level of education has the potential of managing land to their full capacity. Moreover, education levels provide an individual with improved farming practice and familiarity with the benefits.

In this context, a research question was formulated: *"How does the education levels of household head influence land tenure status*? The hypothesis formulated in this regard was "land tenure status of small-scale farmers differs by levels of education. This hypothesis was supported by the findings generated from the Chi-square test statistic. In particular, being a female small-scale farmer with secondary education upsurges the chances of land tenure security. The literature has indicated that men indulge into rural-urban migration to diversify their portfolios by seeking non-farm employment especially when they have tertiary qualifications which make them competitive in the job market whilst those with secondary education may have farming knowledge to some extent, and in turn involve themselves in farming practice.

Moreover, women may be owning more land than males. However, according to Ogunlela and Mukhtar (2009) in the study of gender issues in agriculture and development, indicated that while women's agricultural involvement plays a significant role, they still face hindrances in the farming industry such as lack of resources especially when they are not educated. Likewise, Masuku and Jili (2017) postulate that when a woman is educated, her involvement in the agricultural sector does only play the significant role on the household level, but also in safeguarding national food security and in backing up the country's economy.

5.4.14. Tenure status of land and employment status

To measure whether access to land varies by employment status among small-scale farmers, a hypothesis was proposed: "*The employment status determines land tenure among small-scale farmers*." This hypothesis was supported by the findings of Chi-square statistics, which confirmed a significant relationship between these two variables. The findings further show that males who were not economically active were tenure secure than small-scale farmers who were employed. The findings revealed further that a small portion of small scalers who were employed, owned land for food production. Looking at female population, the findings indicate that female were more likely to own land in 2018 compared to 2015. This means that the percentage has increased over time. Those who are not economically active were rather using sharecropping to access the land.

5.4.15. Tenure status of land by province

In this section, the purpose is to examine the relationship between the tenure status and the province where farmers are located. In this regard, a hypothesis was formulated: "*The land tenure differs by province of small-scale farmers.*" The aim of this hypothesis is to examine whether there is a relationship between land tenure status and province of residence. Using a Chi-square test statistic, the study found an association between these two variables for 2015 and 2018. The Phi and Cramer's V results show a strong association between land tenure and the province a small-scale farmer lives in.

The study revealed that male-headed households who practice small-scale farming reside mainly in Limpopo and are more likely to own the land. Research has shown that, Limpopo province is believed to have more small-scale farmers who produce so much fresh farm products for food security (Baiphethi and Jacobs, 2009). However, small-scale farmers from KwaZulu-Natal access land by means of sharecropping compared to other provinces. Considering females, the findings show that Limpopo is predominated with female small-scale farmers who own land for food production in 2015. KwaZulu Natal indicates a high number of females who access land through sharecropping compared to other provinces. The rest of the provinces of South Africa access land through other means. However, the study shows that small-scale farmers in Free State and North West are not likely to access land using sharecropping in 2015.

5.4.16. Tenure status of land and geographic type

In studying small-scale farming and land tenure, geographic type is a very important feature which is used to identify the variation in land tenure according to the spatial geographies of small-scale farmers residing either in urban or in rural areas. According to the study of Von Fintel and Pienaar (2016) small-scale farming is of wider significance in rural development., As such, the hypothesis that, "*Land tenure of small-scale farmers differs according to geographic type*" was tested and supported by the results of Chi-square statistical test which indicates a significant relationship between these variables. Research has shown that rural livelihoods depend so much on land for household food production (Mokgope, 2000). Land ownership among small-scale farmers is predominant in rural areas for livelihood subsistence. This is mainly found among women who are heading households with children, who has to work hard to support the family, in addition to social security provided by the government.

5.4.17. Use of agricultural products and stock keeping and age group

In this study, age is one of the socio-demographic features used to measure the variations of what agricultural product is used for. Hence, within the context of this study, it was hypothesized that "*There is an association between the use of agricultural product and stock keeping and age group*". The results from a Chi-square statistical test indicate that there is an association between age group and use of agricultural products and stockkeeping. The results showed a P= 0.00<0.05. Phi and Cramer's V were used to measure the strength of this association. The results confirm a weak association in both 2015 and 2018.

The study found that, in 2015, the agricultural products were used as an extra source of food for the household consumption among young small-scale farmers. However, males aged between 23 and 33 were more likely to use the agricultural products as an extra source of income, while females used it as the main source of food for the household. In 2018 however, males used the agricultural product as a source of food for the household, while females used the agricultural product as the main source of food for household consumption. In 2018, male farmers aged between 23 and 33 used agricultural product as an extra source of food for the household. This is typical because people in this age range are assumed to be doing some off-farm activities which can supplement the agricultural products.

5.4.18. Use of agricultural products and stock keeping and population group

A specific research question was asked: what is the agricultural products used for across the population groups in South Africa? Results of the question on issue related to this point were obtained through analysis by controlling the agricultural products and population group by gender in order to measure the variation of agricultural products amongst population group (African/Black, Coloured, Indian/Asian, and White) based on the gender of the head of household. In this regard, a hypothesized statement was "*The use of farm product in the household differs by population group"*. To confirm this hypothesis, a Chi-square statistical test was employed to measure the relationship between those two variables. The results confirm a significant relationship between the use of agricultural products and population group. The strength of this association was measured and found strong by 2015. However, although by 2018, the Phi's coefficient was found strong, Cramer's V showed a moderate association.

In general, the study revealed that 97,3% of Black/African females use the agricultural products as an extra source of food for household consumption. However, Male white small-scale farmers use it as the main source of income. Possibly, these are the white farmers who are involved in commercial farming. In 2018, the findings showed that 98,3% Black/African use the agricultural products as the main source of food for household consumption. However, in 2018, white female small-scale farmers indicated that they use the agricultural product as main source of income. The data shows that Indian/Asian were less involved in agriculture, hence they use other means to generate food and income in the households.

5.4.19. Use of agricultural products and stock keeping and marital status

Marital status plays a significant role to ascertain the disparity in usage of agricultural products among small-scale farmers in South Africa. Hence, the research question *"Does the use of agricultural product differ by marital status?* This research question engendered the hypothesis, *"The use of agricultural product and stock keeping differ according to marital status by gender".* The findings from Chi-square answered the research question and confirmed the hypothesis formulated. The test statistic was statistically significant with a $p=0.000<0.05$. The study found that 77,9% of households headed by single females used the farm products as an extra source of food for the household in 2015. Regarding those who are married, the findings show that they used their agricultural products as main source of income. This might be possible because they might have other sources as food for household subsistence. Furthermore, single females used the agricultural product as main source for food for the

household with 67,5%. In 2018, however, 72,1% reported that they use agricultural product as their main source of food for the household consumption.

The study shows that female farmers who were separated, but still legally married reported lower percentages across all categories of in terms of use of agricultural products. Hence, the hypothesis was supported by the findings that there is a significant relationship between the use of agricultural product and stock keeping is determined by marital status, though the relationship was weak (Munhenga, 2014).

5.4.20. Use of agricultural products and stock keeping by household headship

Demographically, household headship is an important variable that can explain the variations of use of agricultural products and stock keeping in the household. In the context of South Africa, the majority of households are headed by women, which means that female play a very important role in generating food security. In this regard, the hypothesis was formulated that "*The use of agricultural product among small-scale farmers is related to household headship*." To verify this hypothesis, Chi-square test statistic was performed to measure the association between these two variables. The findings confirm the hypothesis since the $p=0.00<0.05$. This means that the test statistic was significant, and the relationship was strong for both 20215 and 2018. The findings revealed that South Africa is highly represented when it comes to females who use food as the main source of income for livelihood compared to men (Ntlapo, 2014). This might be possible because women carry the responsibility to provide for the household, in cases males migrate to pursue off-farm activities (Ellis, 1998; Tshuma, 2014). Thus, the use of agricultural products for livelihoods plays an important role among females who are endowed with a burden of having to be sole providers for the household. However, it is commonly suggested that female-headed households are poorer and more vulnerable than others and that their prevalence is growing, making poverty an increasingly female phenomenon (SOFA Team and Doss, 2011).

5.4.21. Use of agricultural products and stock keeping by highest level of education

As formerly indicated, the level of education is amongst the central features that impact a household's head to agriculture related activities. To identify whether use of agricultural product and stock keeping varies by small-scalers' level of education, a hypothesis was proposed: "*Small-scalers' level of education determines the usage of farm products by the household head as the main source of livelihood in the household*" This hypothesis was

supported by the findings of Chi-square statistics, which confirmed a significant relationship between these two variables in both 2015 and 2018.

The findings depict further that female-headed households in small-scale farming who have had secondary education have higher chances of using the farm products as a main source of food for household consumption. Small-scale farmers with low literacy levels muchly use farm product as the main source of income, the reason could be that they have not educationally advanced and that makes them to be uncompetitive in the job market, as they lack skills. Farming therefore becomes a shoulder link to income diversification, to provide for their families. Educating small scale farmers on management skills has to be in alignment with the strategies which are aimed towards small scale farmers' development (Khapayi and Celliers, 2016). Hence, the following section looks at the impact of employment status on use of agricultural products.

5.4.22. Use of agricultural products and stock keeping by employment status

In this study of land acquisition among small-scale farmers in South Africa, employment is an important variable which indicates the variations of the use of agricultural products among small-scale farmers across all nine provinces of South Africa. In this regard, the hypothesis was formulated: "The *use of farm product and stock keeping by household is determined by employment status.*" The findings generated by the Chi-square test statistic shows an association between use of agricultural product and whether the farmer is employed in off-farm activities or not, and the strength of the association was moderate for 2015, while it was weak in 2018.

Looking at the findings for 2015, it is crystal clear that both males who are not economically active rely on the agricultural products and stock keeping as their extra source of food for the household survival. Females who are employed prefer to use the agricultural products as an extra source of food for the household as well at 69,1%. Some people who are employed are not earning enough to sufficiently secure food for the household. They rather prefer to supplement it with some agricultural products as an extra source of food for the household to survive. Therefore, income diversification becomes a very important feature in the household (Ellis, 2008). This is followed by females who use agricultural products as extra source of income at 67,3%. The 2018 data set indicates that both males and females who are not economically active rely heavily on the agricultural products. They use it as a main source of food for the household to survive (at 66,4%). This means that both males and females who are

not economically active find the social security, such as grant, provided by the government not sufficient to secure food for the household.

5.4.23. Use of agricultural products and stock keeping by province

Province was recognized to be a significant factor which determines use of agricultural product among small-scale farmers in South Africa. In this sub-section, results show that there are variations in use of agricultural products among small-scale farmers according to province of residence. Hence, the research hypothesis "*Use of agricultural products among small-scale farmers differs by province*". To test this assumption, the study used the Chi-square test statistic to examine the relationship between the above-mentioned variables. Furthermore, the Phi and Cramer's V test statistic showed a strong relationship in 2015 GHS data set. The 2018 GHS data set, however, revealed a moderate association. This means that the use of agricultural products is influenced by the province where the farmers reside. It was shown, for example, that small-scale farmers who live in KwaZulu Natal predominantly use the agricultural products as a main source of food for the household for males and females in both 2015 and 2018 GHS data sets. Despite the fact that KwaZulu-Natal covers a small portion of South Africa's land area, a significant percentage of the country's small-scale farmers are based in KwaZulu-Natal. The agriculture continues to play a crucial part in the livelihoods of large numbers of households involving substantial numbers of farmers (Kotze, et.al, 2000).

5.4.24. Use of agricultural products and stock keeping and geographic type

Agriculture in the former homelands of South Africa is generally perceived as 'subsistence' and is extremely marginal in terms of the commercial-dominated agricultural sector (Bembridge 1990). However, agriculture continues to play a crucial role in the livelihoods of large numbers of households, involving substantial numbers of small-scale farmers in rural areas (Cooper 1988). The main purpose in this section is to examine whether the "*Use of agricultural product in the household differs by geographic type where small-scale farmer reside*". To ascertain with this assumption, the Pearson Chi-square test statistic was performed to measure the association between use of agricultural product and geographic type such as rural and urban areas. The findings of this study reveal that there is a significant relationship between the two variables. Furthermore, Phi and Cramer's V indicated that, for 2015 GHS data set, the relationship was moderate, while the findings from the 2018 GHS data set shows that the relationship was weak.

The findings of 2015 indicate that 86,6% of male small-scale farmers who reside in rural areas use farm product and stock keeping mainly as an extra source of income or earning for a living. Looking at females who are small-scale farmers, the findings reveal that 88,9% of female small-scale farmers living in rural areas mainly use their agricultural products and stock keeping as the main source of income to earn a living. Like male small-scale farmers living in rural areas in 2015, the study indicates that GHS data of 2018 depicts male and female small-scale farmers residing in rural areas use their agricultural products mainly as an extra source of income as well, with 84,1% and 84,3% respectively. These findings support Adey et al (2000)'s findings who show that for most families in the rural areas, income is usually not from one source, but is derived from a number of activities.

5.5. The logistic regression results

To ascertain the determinants of access to land for food production among small-scale farmers and to what extent they influence land access, the study used logistic regression analysis. Diverse models were employed to express the influence of every single independent variable on dichotomised dependent variables.

5.5.1. Agricultural activities

Agriculture subsidises poverty at rural, urban, and national levels by easing food prices, job creation, improving real wages; and expanding farm profits, and it has to be noted that poverty cycles are prevalent in rural areas of South Africa (Machete, 2004). Agricultural activity was the first dependent variable which was dichotomised to set apart the household heads who are involved in agricultural activities. More so, variables that impact accessibility to land acquisition among small-scale farmers in South Africa were distinguished and tested. The level of statistical significance was set at 0.05. The test showed significance, and the data fits the model. Correspondingly, the model coefficient and Hosmer-Lemeshow tests were significant for both 2015 and 2018 GHS data sets.

Age was among the characteristics identified as significant and influences the chances of agricultural involvement. The findings suggest that being young may increase the chances of being involved in agricultural undertakings. Quite precisely, the study findings depict those small-scale farmers aged between 23-33 and 34-44 are most likely to engage in agriculture-related activities. However, the results contradict with the study conducted by Mashamaite (2014) on contributions of smallholder subsistence agriculture towards rural household food

security, which found that a small number of young farmers are agriculturally involved. Quite the contrary, this study found that being among the elderly reduces the chances of practicing farming. Rather, the author's findings were that those in age group of 36-50 were noticeable to be in farming, together with those over 50 years of age. Furthermore, the supposition could be that some have retired from various occupations and therefore diversified to farm practices.

Population group was also found to be significant and contributes to being agriculturally involved. However, the results were quite interesting, given that there are more small-scale farmers who are black. The results suggest that being an Indian/Asian small scaler increases the chances of being agriculturally involved than being white by 2015. Nonetheless, by 2018 the results showed that being either coloured or Indian/Asian heightens the prospects of indulging in farm practice. Marital status was found to be significant for both 2015 and 2018, and results revealed that being single increases the chances of being agriculturally involved. Given the sky-high unemployment rates in South Africa, the married may financially interjoin their incomes to afford life's basic needs whilst the single people heading households, without any external financial back-up might resort to agricultural activities to produce food for survival on a daily basis.

The farm output is dependent on the education level of the rural farmers to comprehend and be in terms with the technical modifications which can be too complicated to be understood by the uneducated rural farmers (Okpachu et al., 2014). Hence, the results further revealed that education levels impact the probability of involvement in agriculture-related activities. It is indicated by the findings that small-scale farmers with secondary education have increased possibilities of indulging in farm practice. This implies that small-scale a farmer's level of education determines their chances of agricultural involvement. The results match with the findings from Oduro-Ofori et al., (2014) where it was the major finding that as the level of education increases, productivity increases, with secondary level of education having the highest revenues on farming productivity as secondary education gives a farmer basic literateness and mathematical ability and skills.

Looking at employment status, the results indicate that being a small-scale farmer, employed or unemployed, enhances the chances of being engaged in agricultural activities than those who are not economically active in South Africa. The unemployed small-scale farmers may engage in agricultural activities because of lacking financial means to buy agricultural products. On the other hand, the employed may engage in farming activities out of interest, as a leisure

activity, or to supplement some of the farm products which many be expensive in the formal markets.

Moreover, the findings uncovered that being a small-scale farmer residing in any other South African province intensifies the possibilities of being agriculturally engaged than those who reside in Limpopo province. Rather, the 2018 GHS data set shows the Free State province as insignificant. With that disclosure, the results are not surprising at all. The Statistics South Africa 2011 Census key highlights report stated that an overall of 24,4% of households in agriculture (Statistics South Africa, 2011). The study findings further indicate that a small-scale farmer dwelling in an urban area has higher chances of being agriculturally involved than small-scale farmers inhabiting in rural areas. These were some of the surprising results as the expectation was that since most of small-scale farmers are situated in rural areas, they are the most likely to engage in farm activities. The reason could be that small-scale farmers in urban areas have got accessibility to resources that enable a better farming experience and intensified farming outputs. Conversely, this could be a hindrance for farmers in rural areas.

5.5.2. Tenure status of land

Tenure status of land is the second dependent variable dichotomised to ascertain the most common tenure status that household heads who are small-scale farmers are most likely to acquire, and thus scrutinize the degree to which the land is owned. The factors affecting land ownership were examined among small-scale farmers within South Africa. The GHS data set findings revealed the significance of the omnibus test of model coefficient, alongside Hosmer Lemeshow which suggested that the data was fit for the model.

The results indicate that age, marital status, level of education, employment status, province, and geographic type all affect the likelihood of land tenure among small-scale farmers. For instance, age was among the leading factors determining land tenure among African female small-scale farmers. Moreover, of all age groups, only small-scale farmers aged 56-66 were found to be insignificant with land tenure. Similarly, by 2018, of all the age groups, only 45-55 and 56-66 were found insignificant. Additionally, marital status results indicate that being married or being widowed increase the chances of owning land than being single. This makes sense because both married and widowed people at some point in their lives have spouses, which requires them to acquire land, where they will stay with those who are subsequently allowed to join the households, such as children, and possibly allow for flexibility to practice

farm activities in it. The widowed woman has higher chances of inheriting the late husband's land.

Looking at level of education, the findings show that being a small-scale farmer in possession of secondary level of education lessens the chances of land ownership than those who have tertiary education. This might be because educated individuals tend to pull towards rural-urban migration to seek more economic opportunities, which may be scarce in the rural areas. The findings also show that being employed as a small-scale farmer increases the likelihoods of being tenure secure over the economically inactive. Nevertheless, it was also disclosed that an unemployed small-scale farmer has lesser chances of owning a piece of land than those who are not economically active. This might be true because somebody who does not have another source of income, especially from a salary, finds it difficult to have funds to buy a land for farming.

The results further depicted that small-scale farmers have greater chances of owning land in any province of South Africa, except for Northern Cape, which was in 2015. With respect to geographic type, a small-scale farmer residing in an urban area has lesser chances of owning land for livelihood food production likened to small-scale farmers located in rural areas.

5.5.3. Use of agricultural products and stock keeping

Historically, rural households self-produced large amounts of their own food. Small-scale farming reduces the openness of food insecurity on both rural and urban, enhancing livelihoods, and allowing for cost-effective markets. Hence, a need arises to substantially expand the efficiency of subsistence agriculture as a safety measure for prolonged food security (Baiphethi and Jacobs, 2009). The use of agricultural products and stockkeeping was the third dependent variable manipulated and dichotomised in this study. More so, it adds essence to the study by examining the probabilities of the household heads who use the farm products as a main source of food for household consumption. The findings from logistic regression analysis show that age group, population group, marital status, level of education, employment status, province and the geographic type are significant.

Age is among some of the contributing factors in the study of household heads who acquire land to practice small-scale farming, such that results depict that being a small-scale farmer in ages between 34-44 decreases the possibility of using agricultural products or stock keeping as a main source of food for the household to survive than those who are aged 67 and above. The reason behind this could be that between ages 34 and 44,the majority are infused in off-

farm activities, in employment. That necessitates non-farm skills which is predominantly based in urban areas away from rural areas.

Regarding population group, the study findings indicate that being a black/African small-scale farmer decreases the chances of using agricultural products and stock keeping as the main source of food for household consumption in association with the White racial group. This might be true because the majority of people who own farms are white. On the other hand, the results indicate that being a coloured small-scale farmer upsurges the probabilities of using agricultural products and stock keeping as the main source of food for consumption within the household.

Marital status was also found to influence the use of agricultural products and stockkeeping. The study findings showed that a small-scale farmer who is a divorcee may escalate the likelihoods of consuming the agricultural products and stock keeping as main source of food for livelihood than those who are single. This assumption might be true. For example, in cases where the other spouse who used to be the sole provider, or was plentifully the contributor financially is no longer around, the other spouse will have to make ends meet to survive, resorting to subsistence farming to produce food as the main source of livelihood.

Employment status is one of the most significant factors influencing the welfare of all the small-scale farmers. The results presented that being an unemployed small-scale farmer raises the chances of using the agricultural products and stock keeping as the main source of food for household use than those who are not economically active.t This might be very true, because having no occupation or job that brings in income to the household may be a challenge. For instance, to buy basic food such as vegetables and fruits which are almost consumed daily, may not be cost-effective especially in formal markets and thus makes the buying power inflexible for those who are unemployed. As a consequence, resorting to subsistence agriculture to produce food as the main source of consumption by the household takes priority.

With respect to the province, the study findings portrayed that a small-scale farmer residing in any province in South Africa lessens the chances of consuming the farm products and stock keeping as a main source of food for the household for survival by means of association with small-scale farmers residing within the Limpopo province. The Limpopo province is foremost dependent on farming and comprises numerous small-scale farmers. The study by Oni et al., (2012) mentions about 519 000 of small-scale farmers within the Limpopo, with 28% of those farmers being female, given that the study findings revealed that there are more female headed

households who practice small-scale farming who use the agricultural products and stockkeeping as the main source of food to feed the household. More so, farming in Limpopo enhances the food security as from the household to the provincial level (Oni et al., 2012).

Moreover, among the small-scale farmers in South Africa, those living in urban area have lesser chances of consuming the agricultural products and stock keeping as the main source of food for household consumption than those dwelling in rural areas. In rural areas all over the world, farming signifies the most important land use and a major component of the sustainability of rural areas. Therefore, the results are not shocking at all. Farming, together with its related activities formulate the fundamental make-up of rural life. It is therefore expected for household heads who are farmers situated in rural areas to utilize their farm products as the main source of food for household consumption.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

This chapter consolidates the work done from the first chapter, where the research problem was presented up to the outcomes of the study in chapter five. Moreover, it focuses on providing a summary of the findings, resulting from the data analysis and further provide recommendations and concluding the study. The study examines the land acquisition for food production among small-scale farmers across nine provinces of South Africa, specifically looking at small-scale farmers' sociodemographic and socio-economic characteristics such as age, gender (used to control), population group, level of education, and employment status, to name a few. Locational variables, such as the province and geographic type were used to examine farming patterns. The study, nevertheless, utilizes secondary data requested from StatsSA (GHS 2015 & GHS 2018) by making a comparison to reach this conclusion. The data was analysed using SPSS statistical software version 27.

This study featured univariate analysis, by means of descriptive statistics, to study the distribution of the variables. To test the significance of the relationship between independent and dependent variables, bivariate analyses such as cross-tabulation, Chi-square test statistics, Phi, and Cramer's' V were utilized. Additionally, the study also used multivariate analysis, using binary logistic regression to examine the factors contributing to small-scaler's access to land tenure, agricultural activities, and the use of agricultural activities in South Africa. Moreover, Sustainable Livelihood was used to explain this study on land acquisition for food production among small-scale farmers in South Africa.

6.2. Summary of the research

This study was based on adequate evidence that shows the small-scale agriculture, to be faced by a number of challenges, to be precise "the land" and possibilities which are available for the better development of this sector predominantly in relation to financial and formal sustainability. The food insecurity in rural areas of South Africa remains the challenge.

By means of SLA, the consensus was that the effectiveness of small-scale farming agriculture in tackling food security primarily is determined by availability, strengths and weaknesses of the local assets and structures, paying particular attention to the local context of each different area. On the contrary, the South African government has unsuccessfully sustained the competence of small-scaler's input to food security, just as the literature has indicated that the

outputs from household heads involved in framing does not only provide food from the household level, somewhat stabilizes food security on a national level. With that said, the necessity arises to reconsider the underlying features of the small-scale sector. Given numerous challenges highlighted and discussed on the literature directly affecting the small-scale growth, this thesis attests that greater support is required to ensure the success of small-scale farmers. It calls for reviewing of land policies, that will integrate small-scalers, and in the long run. The intention should be embroiled around establishing formal corporations and lay economic bases that empower the small-scale farmers to show their full capacity in order to eliminate food insecurity.

This research shows that land enables the small-scale farmers to produce their food to feed the households, and some could be sold to local markets, should there be a surplus, meaning that some income could be generated from the harvested products. Moreover, it implies that subsistence farming expansion is an operative development approach that forms the substantial livelihood establishment for the small-scalers. In spite of this, it is disheartening to see that small-scale subsistence production, though it has been revealed to be significant in curbing food security setback and rural poverty on the whole, the output of this sector is extremely poor and unable to address the barrier of the food security in South Africa, especially in rural areas. Therefore, various livelihood diversification strategies are employed where some of the small-scale farmers migrate and leave the farm practices to indulge in off-farm activities in the urban areas.

Policies to prioritize, or at least join in small-scale farmers are needed. Moreover, such policies will then help lift up outputs of emerging or already producing farmers, comprising increased land access and legitimate support, enhance availability of food and subsidize local food prices henceforth engendering higher incomes which play a very vital role in wrestling food insecurity. The land reform policy holds essence in addressing food security in South Africa and was discussed in prior chapters. This is for the reason that there can never be small-scale subsistence production and household food security if household heads lack accessibility to user-friendliness, and enough land to make a transformation in either producing large quantities of food or generating some income from productivity.

This research therefore holds essence that notwithstanding the small-scale farmers' substantial role played in growing share crops to maintain food utilisation, there are still massive land

constraints which hinder the small-scale farmers to produce even more, create employment and eliminate poverty cycles that wearyingly exist.

6.2.1. Agricultural activities in South Africa

The study findings show that female household heads are most likely to be involved in agricultural activities, and the literature did indicate that it is because most of them are left with the burden to be providers for the household, as their husbands migrate to further places to partake in off-farm activities. More so, the results showed that small-scale farming is selective of individuals in younger age groups. On the other hand, the older lose interest in farming. The socio-economic results found that the largest group of farmers at 39,6% and 38,4% consecutively for the years under comparison, were between the ages of 12 and 22. This basically means that youth of South Africa are the most vulnerable population in terms of land scarcity. The maximum age of the group of farmers interviewed in the study area was found to be 67 years and older and are less involved in agricultural activities. Therefore, the older may lose interest in acquiring land because they may not reach full potential in it as they might not be bodily fit as the youth is.

Noteworthy also is the marital status, single people were found to be agriculturally involved, surpassing other marital statuses, and this variable was found to be having a positive relationship with agricultural activities. The education levels were found to have a positive correlation with agricultural activities. The study results reflect that 40,1% of female small-scale farmers practicing agriculture obtained a secondary education as the highest educational achievement, while 5,4% obtained tertiary education. The rest had primary education whilst others had no schooling at all. Hence this study found out that 67,4% and 64,7% of females were not economically active over males, showing that there are dissimilarities with regards to farm practices. With only a few of small-scale farmers employed, for instance in 2015, only 22,9% of females were employed, and 28,9% of males employed, which condenses the bulk of these communities poor or living under the poverty stroke.

Moreover, the findings showed that Limpopo is the centre of agricultural activities. It is believed that Limpopo occupies about 10,2% of the land size of the whole of South Africa practicing farming and producing food household survival and supplying some to the reachable national markets (Oni et al.,2012). The findings further revealed that about 81,6% and 82,0% of females who are into farming are situated in non-urban areas. This informs us that the small-scale farmers, more especially in rural areas are really in need of land for subsistence farming.

They depend as almost the main livelihood strategy, rather the lack of land access propels some to diversify to other livelihood patterns.

6.2.2. Tenure status of land

The study kept on controlling for gender, to observe dissimilarities amongst males and females, and largely examine structural changes. The findings of this study also reveal that tribal authority is the most leading tenure status that household heads are likely to acquire. However, it is absolutely evident that this method is not eye-opening enough in addressing the growing land demand and speed up the land reform policies to get rid of land constraints in South Africa. This study informs that as the majority of small-scale farmers are situated in rural areas which is where land is regulated by tribal systems. I It is where traditional leaders are almost taking all the reins and land is an asset that has no substitute and precious that it becomes grim for tribal owners to distribute it. They are desperately in need of it for livelihood purposes.

The 47,8% of males was reported to be the majority who occupy the land for sharecropping in the younger age group of 12-22. The study reveals that the Indian/Asian population is not much absorbed into farming, which could explain why there are so many blacks owning the land more than other racial groups as the majority was amongst females who reported 94,3% by 2018 to be owning the land. Nonetheless, as earlier stipulated, the tribal authority as the tenure status takes much prevalence. Thus far, the findings of the study have shown that the single are more agriculturally involved, which complements the proposal that male small-scale farmers owned the land more than their female counterparts in both 2015 and 2018, where 75,4% and 75,2% respectively were reported. This informs us that single small-scale farmers acquire land to produce in it as depicted underneath the sharecropping category. Besides, given that the youth unemployment rate in South Africa it is extremely high, young people are physically fit and external funders target youths who are keen to start such enterprises.

The results in the study reveal that more than half of females to be heading households, a 52,6% and 54,4% respectively for both years was reported, the same females also reported high percentages among small-scale farmers who used land to grow crops in it. This explains why there are more female headed households engaged in agriculture, the essence of things dwells with subsistence food production. The findings of this study also reflect gender control on education level, and a high percentage of 41,1% was reported, which was for females immersed in subsistence agriculture to have obtained secondary education owning the land.

The findings of this study put forward a significant proportion of 64,5% among females not economically active, and a 51,4% occupied a land for sharecropping. It is apparent that being a female small-scale farmer and economically inactive rases the likelihoods of tenure security, and as well operating in crop production, and the rest were the employed and unemployed. The study findings confirmed that it is not a generalization that Limpopo province has most small-scale farmers who survive on subsistence food production, and that most of those small-scale farmers are females headed households. The results from the study portrayed a significant 33,9% and 30,9% respectively of female small-scale farmers who owned the land, and small-scale farmers utilizing and/or occupying sharecropping land were also among females.

These findings approve the notion that females are prevalent as household heads and are faced with the burden of providing for their households. As a result, they are more engaged in farm practice and whenever the land is owned, it is utilized for livelihood related purposes, most of all for food production. It also appeared that most part of the land is owned by the female headed households in the rural areas, which is precisely where most of individuals who practice subsistence farming are concentrated, rather with tribal system dominant which to a certain degree does not emancipate rural dwellers to own land. This means rural poverty and food security are an infinite quest unless rural development does not only get documented but the institutional and practical measures must be taken.

6.2.3. Use of agricultural products and stockkeeping

The findings of the study also showed that small-scale farmers in ages 12-22 reported a significant number (37,7%) of males using farm products as a main source of food for the household by 2018. Moreover, black/African small-scale farmers have lesser chances of using agricultural products and stock keeping as the main source of food for household consumption. Additionally, many farms are owned by the white population due to the land dispossession history that deprived blacks fair land distribution and left them vulnerable to landlessness. Therefore, this explains the shortage or land scarcity. It almost becomes impossible for blacks to produce and use their agricultural products as a main source of food. Consequently, the majority of them prefer to move to other livelihood alternatives, such as employment on off-farm subdivisions.

Herein, the marital status showed a significant 79,5% of males by 2018 in subsistence farming using their harvested products as a main source of food for the household. Moreover, households headed by males are not likely to use the agricultural products and stock keeping

for food consumption as likened with female headed ones. Hence, most of females who obtained secondary education use agricultural products as a main source of food, a significant 42,3% by 2018 was reported. Small-scale farmers by virtue of possessing secondary level of education endowing basic literacy skills, are assumed that they reach full potential in productivity, thus, producing large quantities of food as they are survivalists to feed the household, and where possible, some of the marginal surplus may be sold to generate some income. The findings indicated the not economically active females who are small-scale farmers use agricultural products and stock keeping as main source of food for consumption in the household. For instance, a significant 66,4% was reported by 2018. Moreover, the study findings reported that most small-scale farmers residing in KwaZulu-Natal utilize their farmed products as the main source of food. Additionally, small-scale farmers from rural areas are the most prevalent in using the agricultural products and stock keeping as the main source of food for household consumption.

6.3. Recommendations

A number of initiatives aimed at promoting subsistence agricultural development and food security could be put in place. Recommendations on how to enhance the land acquisition issue for small-scale subsistence agriculture towards food security at household level in rural areas are discussed below:

First and foremost, small-scale farmers should be the centre of land reform policy. The small-scale agricultural sector has extremely experienced negligence for years now as South Africa's institutional land reform establishments have been attempting to redistribute land which was acquired away from black people in the course of the apartheid regime. Not forgetting that South Africa has overstressed redistribution of huge commercial farms as single operations. As a result, this rigorously restricts the numbers of people who stand to benefit from land reform, not primarily to land tenure, but rather inclusive of employment creation and rural poverty reduction just as the study has shown that small-scale farming is prevalent in rural settlements.

Meanwhile, there is an ongoing quest to land expropriation without compensation, not as yet implemented. In the meantime, a need arises to implement educational programmes, as study findings and recent literature has shown that most of small-scale farmers do not have outstanding literacy levels. As a result, small-scale farmers need some encouragement to put some strategies in place on how they can diversify their livelihoods, especially improving technologies' education to enable them to produce much demanded products which they can

sell. They will generate money to buy basic needs, inclusive of food to survive because many of them occupy small land sizes which limits production in large quantities.

The evidence from the study hints to the assumption that regardless of the small-scale sector making up the majority of farmers in South Africa, they are not taken seriously by policy makers and are dismissed in the policy making processes. This study points out also that the central impediment encountered by small-scale farmers, ability to lead to effective agricultural productivity is the lack of credit resources and financial institutions. At least if they could receive funds, they could use them to buy some land to steer the flexibility of production in large quantities.

It should also be remembered that in South Africa, based on the study findings there are more female headed households. Land related policies should give precedence to females as the heads of the households carrying the burden of providing, and other highly disadvantaged population, taking into consideration all aspects, such as, unemployed people, less-literate, and impoverished households. I propose that strong and impartial policies be implemented to make sure that women who are left behind to look after their households get all the help they might need, to diversify economically and develop businesswise.

One more key assumption drawn from examining the patterns of small-scale farming agricultural production in South Africa is that this sector remains considered together with misconception that it is only producing crops for subsistence intents. There is a need for the government and other agencies that publish much of information in relation to small-scale agriculture to reintroduce the importance of small-scale agriculture, that it can actually give people a standard life because a majority wants to kick-off to commercialization without gaining experience from humble beginnings, which is small-scale food production. There is need for reviewing the policy framework to create a beneficial environment for the small-scale farmers. Even those who have indulged in off-farm activities might resettle, should land reform policy centralize small-scale farming.

Another conclusion drawn from this thesis is that while there is a role for government to play in supporting small-scale agriculture, this role has not been well-defined by government as well as its interventions.

6.4. Areas of further research

In light of the findings of the study, there is need for further research in this area of land acquisition for small-scale farming to produce food for livelihood:

1) The study finds out that small-scale farming can be used as a tool to fight rural poverty and curb the food insecurity from household level to the national scale. However, there are no clear policies and markets which integrate small-scale farmers who already might have gone out of their way to make ends meet to acquire land. Therefore, under such a context there is need for detailed investigation on the potential role of small-scale farming and channels which may be clear enough even to laymen to market agricultural and stockkept products.

2) There is also the need to investigate land acquisition for small-scale farming. The study used old data which was the GHS 2015 and GHS 2018 from Statistics South Africa to observe structural changes. Recent data may be used to see if there have been improvements.

6.5. Conclusion

The study aimed to explore characteristics that determine land acquisition for small-scale farming to produce food for subsistence in South Africa. By means of using sustainable livelihoods framework as the tool for deepening and constructing the theoretical framework , it became crystal clear that small-scale farmers have not made use of their full potential to ensure sufficient food production and diversification of livelihood strategies. The research established that the nature and extent of small-scale farmers' capability to ensure food security is subject to dynamic developments oscillating from the accessible assets, socioeconomic factors, and policy environment. This research established that small-scale farming is almost the main livelihood option for the rural dwellers of South Africa. However, South Africa's capability to preserve food security is influenced by a number of challenges like poor institutional framework, lack of capital. Literature by some means highlighted population growth, which increased a demand for land. The interplay of apartheid made things even worse.

This study further concludes that the improvement is almost one-dimensional, females being the interest group that almost the whole study is centralized. For instance, the study results disclosed that households headed by females intensified their agricultural involvement as from 2015 to 2018 over males, meaning that small-scale farming is more selective of females. Agreeably, it is not surprising at all because both recent and old literature from various scholars

showed that females have the whole obligation, entirely lying on their shoulders to be providers for their households.

More so, the study holds that with regards to household heads acquiring land increased, female heads who owned land increased, and on the other hand, males decreased. With that said, it is not surprising once again as to why a lot of scholars enfolded the theme of land feminization, however this study controlled for both genders to observe structural changes. As a result, women are seemingly fighting to take their rightful place in development integration as they were previously disadvantaged. As for men, the literature unpacked that they are prone and selective of migration, to be involved in non-agricultural livelihoods.

The food consumption by the household also arises as a theme in showing the improvement of land acquired for small-scale farming to produce food. The male headed also may have used the farmed products for feeding their households. However, female headed households reported a significant increase in using the farm products as a main source of food for the household consumption, whereas males reported a significant decline too. As already postulated, females are radically integrating themselves in a development. If it was not for that, the social status of women in the society would still be way worse than it was previously. The study shows that there have been evolvements such that women have liberated from being confined themselves at home, to be breeding resources, only to give birth to babies that might have a tough time growing up due to lack of nutritional diet, which could come from some of the products farmed, in cases some may be sold so that basic needs can be afforded and even more, depending on the farm outputs.

Moreover, a variety of stakeholders, government, NGOs, private sub-divisions should come together to create a positive environment for small-scale farmers to contribute effectively to agricultural production so that the predicament of food insecurity in South Africa, and rural poverty can be well resolved . Be that as it may, there is necessity to diminish the land constraints that hinder the small-scaler's capability to ensure food security for consumption or livelihood intents.

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Appendices

Appendix 1: Distribution of agricultural activities by province and gender

Gender	Agricultural activities	Province (2015)									
		Western Cape	**Eastern Cape**	**Northern Cape**	**Free State**	**KwaZulu-Natal**	**North West**	**Gauteng**	**Mpumalanga**	**Limpopo**	Total
Male	Yes	163	2133	254	416	1978	371	323	1096	1991	8725
		1,9%	24,4%	2,9%	4,8%	22,7%	4,3%	3,7%	12,6%	22,8%	100,0%
	No	3276	2603	1371	1633	4426	1946	7649	1790	1875	26569
		12,3%	9,8%	5,2%	6,1%	16,7%	7,3%	28,8%	6,7%	7,1%	100,0%
	Total	3439	4736	1625	2049	6404	2317	7972	2886	3866	35294
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	161	2429	275	533	2204	380	333	1244	2507	10066
		1,6%	24,1%	2,7%	5,3%	21,9%	3,8%	3,3%	12,4%	24,9%	100,0%
	No	3530	3061	1583	1809	4932	2085	7804	1967	2020	28791
		12,3%	10,6%	5,5%	6,3%	17,1%	7,2%	27,1%	6,8%	7,0%	100,0%
	Total	3691	5490	1858	2342	7136	2465	8137	3211	4527	38857
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100,0%	100.0%	100.0%
	Province (2018)										
Male	Yes	86	1877	176	398	1899	268	383	962	1771	7820
		1,1%	24,0%	2,3%	5,1%	24,3%	3,4%	4,9%	12,3%	22,6%	100,0%
	No	3248	2547	1360	1474	4093	1832	7216	1888	2034	25692
		12,6%	9,9%	5,3%	5,7%	15,9%	7,1%	28,1%	7,3%	7,9%	100,0%
	Total	3334	4424	1536	1872	5992	2100	7599	2850	3805	33512
		100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Female	Yes	81	2053	190	478	2244	296	425	1138	2240	9145
		0,9%	22,4%	2,1%	5,2%	24,5%	3,2%	4,6%	12,4%	24,5%	100,0%

	No	3484 12,4%	3023 10,8%	1611 5,7%	1704 6,1%	4598 16,4%	1930 6,9%	7439 26,5%	2052 7,3%	2242 8,0%	28083 100,0%
	Total	3565 100.0%	5076 100.0%	1801 100.0%	2182 100.0%	6842 100.0%	2226 100.0%	7864 100.0%	3190 100.0%	4482 100.0%	37228 100.0%

Appendix 2: Differentials in tenure status of land by age group and gender

Gender	Tenure status of land	Age group (2015)						
		12-22	**23-33**	**34-44**	**45-55**	**56-66**	**67+**	Total
Male	Owns the land	1072 38,1%	561 19,9%	367 13,0%	347 12,3%	268 9,5%	200 7,1%	2815 100,0%
	Rents the land	10 22,7%	12 27,3%	10 22,7%	8 18,2%	4 9,1%	0 0,0%	44 100,0%
	Sharecropping	11 47,8%	3 13,0%	2 8,7%	6 26,1%	1 4,3%	0 0,0%	23 100,0%
	Tribal authority	625 46,3%	243 18,0%	157 11,6%	112 8,3%	114 8,4%	100 7,4%	1351 100,0%
	State land	9 28,1%	6 18,8%	7 21,9%	5 15,6%	2 6,3%	3 9,4%	32 100,0%
	Total	1727 100.0%	825 100.0%	543 100.0%	478 100.0%	389	303 100.0%	4265 100.0%
Female	Owns the land	975 27,2%	671 18,7%	570 15,9%	542 15,1%	416 11,6%	410 11,4%	3584 100,0%
	Rents the land	15 27,3%	18 32,7%	6 10,9%	9 16,4%	5 9,1%	2 3,6%	55 100,0%
	Sharecropping	12	7	3	4	5	1	32

		37,5%	21,9%	9,4%	12,5%	15,6%	3,1%	100,0%
	Tribal authority	574 31,8%	310 17,2%	237 13,1%	255 14,1%	217 12,0%	211 11,7%	1804 100,0%
	State land	20 38,5%	9 17,3%	6 11,5%	8 15,4%	2 3,8%	7 13,5%	52 100,0%
	Total	1596 100.0%	1015 100.0%	822 100.0%	818 100.0%	645 100.0%	631 100.0%	5527 100.0%
	Age group (2018)							
Male	Owns the land	864 35,7%	458 18,9%	318 13,1%	287 11,9%	286 11,8%	208 8,6%	2421 100,0%
	Rents the land	13 31,7%	6 14,6%	6 14,6%	10 24,4%	4 9,8%	2 4,9%	41 100,0%
	Sharecropping	14 41,2%	9 26,5%	3 8,8%	2 5,9%	5 14,7%	1 2,9%	34 100,0%
	Tribal authority	550 44,2%	243 19,5%	144 11,6%	99 8,0%	109 8,8%	98 7,9%	1243 100,0%
	State land	18 34,0%	11 20,8%	9 17,0%	8 15,1%	4 7,5%	3 5,7%	53 100,0%
	Total	1459 100,0%	727 100,0%	480 100,0%	406 100,0%	408 100,0%	312 100,0%	3792 100.0%
Female	Owns the land	863 26,5%	585 18,0%	453 13,9%	512 15,7%	427 13,1%	412 12,7%	3252 100,0%
	Rents the land	13 24,1%	9 16,7%	15 27,8%	11 20,4%	3 5,6%	3 5,6%	54 100,0%
	Sharecropping	9 22,0%	10 24,4%	6 14,6%	5 12,2%	7 17,1%	4 9,8%	41 100,0%
	Tribal authority	484	294	227	230	207	189	1631

		29,7%	18,0%	13,9%	14,1%	12,7%	11,6%	100,0%
	State land	17	14	13	8	9	4	65
		26,2%	21,5%	20,0%	12,3%	13,8%	6,2%	100,0%
	Total	1386	912	714	766	653	612	5043
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Appendix 3: Distribution of tenure status of land by population group and gender

Gender	Tenure status of land	Population group (2015)				
		African/Black	**Coloured**	**Indian/Asian**	**White**	Total
Male	Owns the land	3873	109	33	148	4163
		93,0%	2,6%	0,8%	3,6%	100,0%
	Rents the land	40	5	0	17	62
		64,5%	8,1%	0,0%	27,4%	100,0%
	Sharecropping	34	1	0	2	37
		91,9%	2,7%	0,0%	5,4%	100,0%
	Tribal authority	2124	0	4	0	2128
		99,8%	0,0%	0,2%	0,0%	100,0%
	State land	47	1	0	0	48
		97,9%	2,1%	0,0%	0,0%	100,0%
	Total	6118	116	37	167	6438
		100.0%	100.0%	100.0%	100.0%	100.0%
Female	Owns the land	4541	116	29	154	4840
		93,8%	2,4%	0,6%	3,2%	100,0%
	Rents the land	39	9	0	22	70

		55,7%	12,9%	0,0%	31,4%	100,0%
	Sharecropping	39	3	0	1	43
		90,7%	7,0%	0,0%	2,3%	100,0%
	Tribal authority	2576	0	0	0	2576
		100,0%	0,0%	0,0%	0,0%	100,0%
	State land	61	0	0	1	62
		98,4%	0,0%	0,0%	1,6%	100,0%
	Total	7256	128	29	178	7591
		100.0%	100.0%	100.0%	100.0%	100.0%
	Population group (2018)					
Male	Owns the land	3385	80	17	128	3610
		93,8%	2,2%	0,5%	3,5%	100,0%
	Rents the land	44	1	1	9	55
		80,0%	1,8%	1,8%	16,4%	100,0%
	Sharecropping	50	0	0	2	52
		96,2%	0,0%	0,0%	3,8%	100,0%
	Tribal authority	1933	9	0	2	1944
		99,4%	0,5%	0,0%	0,1%	100,0%
	State land	68	3	0	0	71
		95,8%	4,2%	0,0%	0,0%	100,0%
	Total	5480	93	18	141	5732
		100,0%	100,0%	100,0%	100,0%	100.0%
Female	Owns the land	4097	99	18	132	4346
		94,3%	2,3%	0,4%	3,0%	100,0%
	Rents the land	72	0	2	5	79
		91,1%	0,0%	2,5%	6,3%	100,0%
	Sharecropping	48	0	0	2	50

		96,0%	0,0%	0,0%	4,0%	100,0%
	Tribal authority	2249 99,5%	6 0,3%	0 0,0%	5 0,2%	2260 100,0%
	State land	88 100,0%	0 0,0%	0 0,0%	0 0,0%	88 100,0%
	Total	6554 100.0%	105 100.0%	20 100.0%	144 100.0%	6823 100.0%

Appendix 4: Tenure status of land by marital status and gender

Gender	Tenure status of land	Marital status (2015)					
		Married	**Divorced**	**Separated, but still legally married**	**Widowed**	**Single**	Total
Male	Owns the land	909 21,9%	36 0,9%	18 0,4%	61 1,5%	3133 75,4%	4157 100,0%
	Rents the land	25 40,3%	0 0,0%	0 0,0%	0 0,0%	37 59,7%	62 100,0%
	Sharecropping	6 16,2%	0 0,0%	0 0,0%	0 0,0%	31 83,8%	37 100,0%
	Tribal authority	348 16,4%	6 0,3%	15 0,7%	43 2,0%	1714 80,6%	2126 100,0%
	State land	15 31,3%	0 0,0%	0 0,0%	0 0,0%	33 68,8%	48 100,0%
	Total	1303 100.0%	42 100.0%	33 100.0%	104 100.0%	4948 100.0%	6430 100.0%
Female	Owns the land	1097	71	34	526	3107	4835

		22,7%	1,5%	0,7%	10,9%	64,3%	100,0%
	Rents the land	27 38,6%	1 1,4%	0 0,0%	0 0,0%	42 60,0%	70 100,0%
	Sharecropping	6 14,0%	0 0,0%	1 2,3%	6 14,0%	30 69,8%	43 100,0%
	Tribal authority	491 19,1%	24 0,9%	23 0,9%	338 13,1%	1695 65,9%	2571 100,0%
	State land	15 24,2%	0 0,0%	0 0,0%	9 14,5%	38 61,3%	62 100,0%
	Total	1636 100.0%	96 100.0%	58 100.0%	879 100.0%	4912 100.0%	7581 100.0%
	Marital status (2018)						
Male	Owns the land	789 21,9%	29 0,8%	16 0,4%	58 1,6%	2711 75,2%	3603 100,0%
	Rents the land	23 41,8%	3 5,5%	0 0,0%	0 0,0%	29 52,7%	55 100,0%
	Sharecropping	9 17,3%	1 1,9%	1 1,9%	0 0,0%	41 78,8%	52 100,0%
	Tribal authority	330 17,0%	11 0,6%	13 0,7%	32 1,6%	1557 80,1%	1943 100,0%
	State land	12 16,9%	2 2,8%	0 0,0%	2 2,8%	55 77,5%	71 100,0%
	Total	1163 100,0%	46 100,0%	30 100,0%	92 100,0%	4393 100,0%	5724 100.0%
Female	Owns the land	952 22,0%	61 1,4%	22 0,5%	483 11,1%	2816 65,0%	4334 100,0%
	Rents the land	27	1	1	4	46	79

		34,2%	1,3%	1,3%	5,1%	58,2%	100,0%
	Sharecropping	10	3	0	6	31	50
		20,0%	6,0%	0,0%	12,0%	62,0%	100,0%
	Tribal authority	447	23	27	289	1473	2259
		19,8%	1,0%	1,2%	12,8%	65,2%	100,0%
	State land	13	1	0	7	67	88
		14,8%	1,1%	0,0%	8,0%	76,1%	100,0%
	Total	1449	89	50	789	4433	6810
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Appendix 5: Tenure status of land by highest level of education and gender

Gender	Tenure status of land	Highest level of education (2015)				
		No education	**Primary**	**Secondary**	**Tertiary**	Total
Male	Owns the land	776	1502	1587	215	4080
		19,0%	36,8%	38,9%	5,3%	100,0%
	Rents the land	10	16	24	8	58
		17,2%	27,6%	41,4%	13,8%	100,0%
	Sharecropping	6	19	10	0	35
		17,1%	54,3%	28,6%	0,0%	100,0%
	Tribal authority	456	953	656	48	2113
		21,6%	45,1%	31,0%	2,3%	100,0%
	State land	9	17	21	1	48
		18,8%	35,4%	43,8%	2,1%	100,0%
	Total	1257	2507	2298	272	6334

		100.0%	100.0%	100.0%	100.0%	100.0%
Female	Owns the land	1019	1505	1927	303	4754
		21,4%	31,7%	40,5%	6,4%	100,0%
	Rents the land	13	16	32	7	68
		19,1%	23,5%	47,1%	10,3%	100,0%
	Sharecropping	11	14	16	2	43
		25,6%	32,6%	37,2%	4,7%	100,0%
	Tribal authority	604	957	888	103	2552
		23,7%	37,5%	34,8%	4,0%	100,0%
	State land	13	13	27	8	61
		21,3%	21,3%	44,3%	13,1%	100,0%
	Total	1660	2505	2890	423	7478
		100.0%	100.0%	100.0%	100.0%	100.0%
	Highest level of education (2018)					
Male	Owns the land	742	1227	1389	175	3533
		21,0%	34,7%	39,3%	5,0%	100,0%
	Rents the land	5	20	22	5	52
		9,6%	38,5%	42,3%	9,6%	100,0%
	Sharecropping	11	18	20	2	51
		21,6%	35,3%	39,2%	3,9%	100,0%
	Tribal authority	391	835	657	41	1924
		20,3%	43,4%	34,1%	2,1%	100,0%
	State land	15	23	29	3	70
		21,4%	32,9%	41,4%	4,3%	100,0%
	Total	1164	2123	2117	226	5630
		100,0%	100,0%	100,0%	100,0%	100.0%
Female	Owns the land	900	1369	1759	252	4280

		21,0%	32,0%	41,1%	5,9%	100,0%
	Rents the land	14	22	38	3	77
		18,2%	28,6%	49,4%	3,9%	100,0%
	Sharecropping	11	14	22	3	50
		22,0%	28,0%	44,0%	6,0%	100,0%
	Tribal authority	442	852	837	107	2238
		19,7%	38,1%	37,4%	4,8%	100,0%
	State land	22	22	37	5	86
		25,6%	25,6%	43,0%	5,8%	100,0%
	Total	1389	2279	2693	370	6731
		100.0%	100.0%	100.0%	100.0%	100.0%

Appendix 6: Distribution of tenure status of land by employment status and gender

Gender	Tenure status of land	Employment status (2015)			
		Employed	**Unemployed**	**Not Economically Active**	Total
Male	Owns the land	791	297	1406	2494
		31,7%	11,9%	56,4%	100,0%
	Rents the land	27	3	10	40
		67,5%	7,5%	25,0%	100,0%
	Sharecropping	5	5	10	20
		25,0%	25,0%	50,0%	100,0%
	Tribal authority	207	151	816	1174
		17,6%	12,9%	69,5%	100,0%
	State land	11	2	18	31
		35,5%	6,5%	58,1%	100,0%

	Total	1041 100.0%	458 100.0%	2260 100.0%	3759 100.0%
Female	Owns the land	836 25,3%	338 10,2%	2131 64,5%	3305 100,0%
	Rents the land	25 52,1%	8 16,7%	15 31,3%	48 100,0%
	Sharecropping	7 23,3%	10 33,3%	13 43,3%	30 100,0%
	Tribal authority	279 16,9%	142 8,6%	1229 74,5%	1650 100,0%
	State land	11 25,0%	4 9,1%	29 65,9%	44 100,0%
	Total	1158 100.0%	502 100.0%	3417 100.0%	5077 100.0%
	Employment status (2018)				
Male	Owns the land	653 30,4%	375 17,5%	1117 52,1%	2145 100,0%
	Rents the land	24 66,7%	2 5,6%	10 27,8%	36 100,0%
	Sharecropping	11 34,4%	6 18,8%	15 46,9%	32 100,0%
	Tribal authority	250 23,7%	92 8,7%	713 67,6%	1055 100,0%
	State land	16 35,6%	12 26,7%	17 37,8%	45 100,0%
	Total	954 100,0%	487 100,0%	1872 100,0%	3313 100.0%

Female	Owns the land	739 25,1%	369 12,5%	1842 62,4%	2950 100,0%
	Rents the land	26 50,0%	6 11,5%	20 38,5%	52 100,0%
	Sharecropping	12 34,3%	5 14,3%	18 51,4%	35 100,0%
	Tribal authority	307 21,4%	97 6,8%	1033 71,9%	1437 100,0%
	State land	13 21,7%	10 16,7%	37 61,7%	60 100,0%
	Total	1097 100.0%	487 100.0%	2950 100.0%	4534 100.0%

Appendix 7: Tenure status of land by province and gender

Gender	Tenure status of land	Province (2015)									
		Western Cape	**Eastern Cape**	**Northern Cape**	**Free State**	**KwaZulu-Natal**	**North West**	**Gauteng**	**Mpumalanga**	**Limpopo**	Total
Male	Owns the land	122 2,9%	431 10,4%	91 2,2%	342 8,2%	782 18,8%	79 1,9%	199 4,8%	777 18,7%	1340 32,2%	4163 100,0%
	Rents the land	16 25,8%	0 0,0%	0 0,0%	8 12,9%	22 35,5%	1 1,6%	10 16,1%	2 3,2%	3 4,8%	62 100,0%
	Sharecropping	1 2,7%	0 0,0%	2 5,4%	0 0,0%	22 59,5%	0 0,0%	2 5,4%	5 13,5%	5 13,5%	37 100,0%
	Tribal authority	0 0,0%	1204 56,6%	0 0,0%	0 0,0%	541 25,4%	0 0,0%	0 0,0%	53 2,5%	330 15,5%	2128 100,0%

	State land	0 0,0%	7 14,6%	1 2,1%	0 0,0%	22 45,8%	0 0,0%	7 14,6%	9 18,8%	2 4,2%	48 100,0%
	Total	139 100.0%	1642 100.0%	94 100.0%	350 100.0%	1389 100.0%	80 100.0%	218 100.0%	846 100.0%	1680 100.0%	6438 100.0%
Female	Owns the land	114 2,4%	475 9,8%	112 2,3%	457 9,4%	849 17,5%	81 1,7%	205 4,2%	904 18,7%	1643 33,9%	4840 100,0%
	Rents the land	21 30,0%	0 0,0%	0 0,0%	6 8,6%	23 32,9%	3 4,3%	14 20,0%	1 1,4%	2 2,9%	70 100,0%
	Sharecropping	3 7,0%	1 2,3%	1 2,3%	0 0,0%	24 55,8%	0 0,0%	4 9,3%	5 11,6%	5 11,6%	43 100,0%
	Tribal authority	0 0,0%	1403 54,5%	0 0,0%	0 0,0%	649 25,2%	0 0,0%	0 0,0%	59 2,3%	465 18,1%	2576 100,0%
	State land	0 0,0%	7 11,3%	1 1,6%	0 0,0%	29 46,8%	0 0,0%	8 12,9%	13 21,0%	4 6,5%	62 100,0%
	Total	138 100.0%	1886 100.0%	114 100.0%	463 100.0%	1574 100.0%	84 100.0%	231 100.0%	982 100.0%	2119 100.0%	7591 100.0%
	Province (2018)										
Male	Owns the land	68 1,9%	326 9,0%	54 1,5%	331 9,2%	686 19,0%	41 1,1%	276 7,6%	779 21,6%	1049 29,1%	3610 100,0%
	Rents the land	2 3,6%	3 5,5%	0 0,0%	21 38,2%	10 18,2%	2 3,6%	5 9,1%	7 12,7%	5 9,1%	55 100,0%
	Sharecropping	0 0,0%	0 0,0%	1 1,9%	1 1,9%	36 69,2%	0 0,0%	1 1,9%	7 13,5%	6 11,5%	52 100,0%
	Tribal authority	0 0,0%	976 50,2%	0 0,0%	0 0,0%	532 27,4%	0 0,0%	0 0,0%	14 0,7%	422 21,7%	1944 100,0%
	State land	2 2,8%	26 36,6%	0 0,0%	0 0,0%	30 42,3%	0 0,0%	9 12,7%	1 1,4%	3 4,2%	71 100,0%

	Total	72 100,0%	1331 100,0%	55 100,0%	353 100,0%	1294 100,0%	43 100,0%	291 100,0%	808 100,0%	1485 100,0%	5732 100.0%
Female	Owns the land	67 1,5%	334 7,7%	71 1,6%	380 8,7%	863 19,9%	52 1,2%	303 7,0%	934 21,5%	1342 30,9%	4346 100,0%
	Rents the land	1 1,3%	11 13,9%	0 0,0%	36 45,6%	13 16,5%	2 2,5%	9 11,4%	5 6,3%	2 2,5%	79 100,0%
	Sharecropping	0 0,0%	0 0,0%	2 4,0%	0 0,0%	31 62,0%	0 0,0%	1 2,0%	7 14,0%	9 18,0%	50 100,0%
	Tribal authority	0 0,0%	1086 48,1%	0 0,0%	1 0,0%	602 26,6%	0 0,0%	0 0,0%	18 0,8%	553 24,5%	2260 100,0%
	State land	0 0,0%	25 28,4%	0 0,0%	0 0,0%	49 55,7%	0 0,0%	8 9,1%	1 1,1%	5 5,7%	88 100,0%
	Total	68 100.0%	1456 100.0%	73 100.0%	417 100.0%	1558 100.0%	54 100.0%	321 100.0%	965 100.0%	1911 100.0%	6823 100.0%

Appendix 8: Tenure status of land by geographic type and gender

Gender	Tenure status of land	Geographic type (2015)		
		Urban	**Non-Urban**	Total
Male	Owns the land	1136 27,3%	3027 72,7%	4163 100,0%
	Rents the land	32 51,6%	30 48,4%	62 100,0%
	Sharecropping	4 10,8%	33 89,2%	37 100,0%

	Tribal authority	57(2,7%	2071 97,3%	2128 100,0%
	State land	24 50,0%	24 50,0%	48 100,0%
	Total	1253 100.0%	5185 100.0%	6438 100.0%
Female	Owns the land	1282 26,5%	3558 73,5%	4840 100,0%
	Rents the land	37 52,9%	33 47,1%	70 100,0%
	Sharecropping	5 11,6%	38 88,4%	43 100,0%
	Tribal authority	63 2,4%	2513 97,6%	2576 100,0%
	State land	37 59,7%	25 40,3%	62 100,0%
	Total	1424 100.0%	6167 100.0%	7591 100.0%
	Geographic type (2018)			
Male	Owns the land	974 27,0%	2636 73,0%	3610 100,0%
	Rents the land	28 50,9%	27 49,1%	55 100,0%
	Sharecropping	2 3,8%	50 96,2%	52 100,0%
	Tribal authority	47 2,4%	1897 97,6%	1944 100,0%

	State land	43 60,6%	28 39,4%	71 100,0%
	Total	1094 100,0%	4638 100,0%	5732 100.0%
Female	Owns the land	1143 26,3%	3203 73,7%	4346 100,0%
	Rents the land	34 43,0%	45 57,0%	79 100,0%
	Sharecropping	3 6,0%	47 94,0%	50 100,0%
	Tribal authority	50 2,2%	2210 97,8%	2260 100,0%
	State land	42 47,7%	46 52,3%	88 100,0%
	Total	1272 100.0%	5551 100.0%	6823 100.0%

Appendix 9: The use of agricultural products and stockkeeping by age group and gender

Gender	Use of agricultural products and stockkeeping	Age group (2015)						
		12-22	**23-33**	**34-44**	**45-55**	**56-66**	**67+**	Total
Male	As a main source of food for the household	165 36,1%	88 19,3%	76 16,6%	67 14,7%	36 7,9%	25 5,5%	457 100,0%
	As the main source of income/earning a living	27 26,0%	16 15,4%	20 19,2%	17 16,3%	16 15,4%	8 7,7%	104 100,0%

	As an extra source of income	94 29,7%	73 23,1%	36 11,4%	45 14,2%	35 11,1%	33 10,4%	316 100,0%
	As an extra source of food for the household	1850 41,4%	857 19,2%	554 12,4%	492 11,0%	404 9,0%	312 7,0%	4469 100,0%
	As a leisure activity or hobby e.g., gardening	131 34,4%	70 18,4%	48 12,6%	49 12,9%	47 12,3%	36 9,4%	381 100,0%
	Total	2267 100.0%	1104 100.0%	734 100.0%	670 100.0%	538 100.0%	414 100.0%	5727 100.0%
Female	As a main source of food for the household	158 27,9%	130 23,0%	90 15,9%	79 14,0%	56 9,9%	53 9,4%	566 100,0%
	As the main source of income/earning a living	28 25,5%	13 11,8%	19 17,3%	25 22,7%	14 12,7%	11 10,0%	110 100,0%
	As an extra source of income	91 27,1%	62 18,5%	38 11,3%	64 19,0%	45 13,4%	36 10,7%	336 100,0%
	As an extra source of food for the household	1665 29,0%	1069 18,6%	841 14,6%	813 14,1%	682 11,9%	679 11,8%	5749 100,0%
	As a leisure activity or hobby e.g., gardening	93 23,0%	66 16,3%	77 19,0%	69 17,0%	59 14,6%	41 10,1%	405 100,0%
	Total	2035 100.0%	1340 100.0%	1065 100.0%	1050 100.0%	856 100.0%	820 100.0%	7166 100.0%
	Age group (2018)							
Male	As a main source of food for the household	159 37,7%	79 18,7%	60 14,2%	48 11,4%	50 11,8%	26 6,2%	422 100,0%
	As the main source of income/earning a living	36 27,9%	23 17,8%	10 7,8%	18 14,0%	27 20,9%	15 11,6%	129 100,0%
	As an extra source of income	137 38,5%	56 15,7%	40 11,2%	50 14,0%	46 12,9%	27 7,6%	356 100,0%

	As an extra source of food for the household	1510 39,1%	739 19,1%	498 12,9%	399 10,3%	403 10,4%	314 8,1%	3863 100,0%
	As a leisure activity or hobby e.g., gardening	133 36,9%	66 18,3%	42 11,7%	37 10,3%	42 11,7%	40 11,1%	360 100,0%
	Total	1975 100,0%	963 100,0%	650 100,0%	552 100,0%	568 100,0%	422 100,0%	5130 100.0%
Female	As a main source of food for the household	190 31,7%	116 19,4%	96 16,0%	82 13,7%	67 11,2%	48 8,0%	599 100,0%
	As the main source of income/earning a living	36 25,4%	15 10,6%	19 13,4%	30 21,1%	25 17,6%	17 12,0%	142 100,0%
	As an extra source of income	104 26,0%	62 15,5%	70 17,5%	70 17,5%	46 11,5%	48 12,0%	400 100,0%
	As an extra source of food for the household	1391 27,4%	926 18,3%	722 14,2%	726 14,3%	671 13,2%	634 12,5%	5070 100,0%
	As a leisure activity or hobby e.g., gardening	114 27,2%	80 19,1%	56 13,4%	49 11,7%	70 16,7%	50 11,9%	419 100,0%
	Total	1835 100.0%	1199 100.0%	963 100.0%	957 100.0%	879 100.0%	797 100.0%	6630 100.0%

Appendix 10: The use of agricultural products and stockkeeping by population group and gender

Gender	Use of agricultural products and stockkeeping	Population group (2015)				
		African/Black	**Coloured**	**Indian/Asian**	**White**	Total
Male		671	12	0	13	696

	As a main source of food for the household	96,4%	1,7%	0,0%	1,9%	100,0%
	As the main source of income/earning a living	73 57,0%	6 4,7%	0 0,0%	49 38,3%	128 100,0%
	As an extra source of income	416 91,6%	19 4,2%	0 0,0%	19 4,2%	454 100,0%
	As an extra source of food for the household	6537 97,0%	98 1,5%	21 0,3%	81 1,2%	6737 100,0%
	As a leisure activity or hobby e.g., gardening	376 71,3%	60 11,4%	22 4,2%	69 13,1%	527 100,0%
	Total	8073 100.0%	195 100.0%	43 100.0%	231 100.0%	8542 100.0%
Female	As a main source of food for the household	763 97,3%	9 1,1%	0 0,0%	12 1,5%	784 100,0%
	As the main source of income/earning a living	85 59,0%	4 2,8%	0 0,0%	55 38,2%	144 100,0%
	As an extra source of income	413 92,6%	15 3,4%	0 0,0%	18 4,0%	446 100,0%
	As an extra source of food for the household	7737 97,2%	125 1,6%	11 0,1%	85 1,1%	7958 100,0%
	As a leisure activity or hobby e.g., gardening	382 72,5%	56 10,6%	21 4,0%	68 12,9%	527 100,0%
	Total	9380 100.0%	209 100.0%	32 100.0%	238 100.0%	9859 100.0%
	Population group (2018)					
Male	As a main source of food for the household	662 98,2%	1 0,1%	3 0,4%	8 1,2%	674 100,0%
		123	3	0	44	170

	As the main source of income/earning a living	72,4%	1,8%	0,0%	25,9%	100,0%
	As an extra source of income	449 91,4%	20 4,1%	0 0,0%	22 4,5%	491 100,0%
	As an extra source of food for the household	5684 97,0%	93 1,6%	13 0,2%	70 1,2%	5860 100,0%
	As a leisure activity or hobby e.g., gardening	437 86,5%	28 5,5%	2 0,4%	38 7,5%	505 100,0%
	Total	7355 100,0%	145 100,0%	18 100,0%	182 100,0%	7700 100.0%
Female	As a main source of food for the household	817 98,3%	1 0,1%	3 0,4%	10 1,2%	831 100,0%
	As the main source of income/earning a living	134 77,5%	1 0,6%	0 0,0%	38 22,0%	173 100,0%
	As an extra source of income	517 93,2%	20 3,6%	0 0,0%	18 3,2%	555 100,0%
	As an extra source of food for the household	6694 97,2%	102 1,5%	16 0,2%	77 1,1%	6889 100,0%
	As a leisure activity or hobby e.g., gardening	491 87,1%	30 5,3%	3 0,5%	40 7,1%	564 100,0%
	Total	8653 100.0%	154 100.0%	22 100.0%	183 100.0%	9012 100.0%

Appendix 11: Differentials in use of agricultural products and stockkeeping by marital status and gender

Gender	Use of agricultural products and stockkeeping	Marital status (2015)					
		Married	**Divorced**	**Separated, but still legally married**	**Widowed**	**Single**	Total
Male	As a main source of food for the household	151	0	1	11	531	694
		21,8%	0,0%	0,1%	1,6%	76,5%	100,0%
	As the main source of income/earning a living	49	1	0	3	75	128
		38,3%	0,8%	0,0%	2,3%	58,6%	100,0%
	As an extra source of income	113	1	1	12	327	454
		24,9%	0,2%	0,2%	2,6%	72,0%	100,0%
	As an extra source of food for the household	1286	48	43	112	5239	6728
		19,1%	0,7%	0,6%	1,7%	77,9%	100,0%
	As a leisure activity or hobby e.g., gardening	153	6	0	14	352	525
		29,1%	1,1%	0,0%	2,7%	67,0%	100,0%
	Total	1752	56	45	152	6524	8529
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Female	As a main source of food for the household	173	7	4	71	529	784
		22,1%	0,9%	0,5%	9,1%	67,5%	100,0%
	As the main source of income/earning a living	51	0	1	9	82	143
		35,7%	0,0%	0,7%	6,3%	57,3%	100,0%
	As an extra source of income	127	0	1	39	278	445
		28,5%	0,0%	0,2%	8,8%	62,5%	100,0%
	As an extra source of food for the household	1634	92	62	954	5206	7948
		20,6%	1,2%	0,8%	12,0%	65,5%	100,0%

	As a leisure activity or hobby e.g., gardening	167 31,7%	16 3,0%	1 0,2%	39 7,4%	303 57,6%	526 100,0%
	Total	2152 100.0%	115 100.0%	69 100.0%	1112 100.0%	6398 100.0%	9846 100.0%
	Marital status (2018)						
Male	As a main source of food for the household	125 18,5%	0 0,0%	3 0,4%	10 1,5%	536 79,5%	674 100,0%
	As the main source of income/earning a living	57 33,5%	8 4,7%	2 1,2%	3 1,8%	100 58,8%	170 100,0%
	As an extra source of income	118 24,0%	2 0,4%	3 0,6%	9 1,8%	359 73,1%	491 100,0%
	As an extra source of food for the household	1139 19,5%	52 0,9%	34 0,6%	86 1,5%	4539 77,6%	5850 100,0%
	As a leisure activity or hobby e.g., gardening	123 24,4%	3 0,6%	2 0,4%	11 2,2%	366 72,5%	505 100,0%
	Total	1562 100,0%	65 100,0%	44 100,0%	119 100,0%	5900 100,0%	7690 100.0%
Female	As a main source of food for the household	148 17,9%	5 0,6%	3 0,4%	75 9,1%	597 72,1%	828 100,0%
	As the main source of income/earning a living	56 32,4%	2 1,2%	3 1,7%	23 13,3%	89 51,4%	173 100,0%
	As an extra source of income	140 25,3%	6 1,1%	0 0,0%	55 9,9%	353 63,7%	554 100,0%
	As an extra source of food for the household	1429 20,8%	87 1,3%	51 0,7%	812 11,8%	4501 65,4%	6880 100,0%
	As a leisure activity or hobby e.g., gardening	142 25,2%	4 0,7%	2 0,4%	52 9,2%	363 64,5%	563 100,0%

	Total	1915 100.0%	104 100.0%	59 100.0%	1017 100.0%	5903 100.0%	8998 100.0%

Appendix 12: The use of agricultural products and stockkeeping by highest level of education and gender

Gender	Use of agricultural products and stockkeeping	Highest level of education (2015)				
		No education	**Primary**	**Secondary**	**Tertiary**	Total
Male	As a main source of food for the household	137 20,1%	258 37,8%	263 38,6%	24 3,5%	682 100,0%
	As the main source of income/earning a living	23 18,3%	27 21,4%	57 45,2%	19 15,1%	126 100,0%
	As an extra source of income	91 20,7%	175 39,8%	153 34,8%	21 4,8%	440 100,0%
	As an extra source of food for the household	1362 20,5%	2706 40,7%	2374 35,7%	212 3,2%	6654 100,0%
	As a leisure activity or hobby e.g., gardening	96 19,1%	163 32,5%	182 36,3%	61 12,2%	502 100,0%
	Total	1709 100.0%	3329 100.0%	3029 100.0%	337 100.0%	8404 100.0%
Female	As a main source of food for the household	188 24,2%	237 30,5%	325 41,8%	27 3,5%	777 100,0%
	As the main source of income/earning a living	18 12,8%	39 27,7%	60 42,6%	24 17,0%	141 100,0%
	As an extra source of income	83 19,0%	157 35,9%	171 39,1%	26 5,9%	437 100,0%

	As an extra source of food for the household	1772 22,6%	2714 34,6%	2992 38,1%	372 4,7%	7850 100,0%
	As a leisure activity or hobby e.g., gardening	83 16,3%	162 31,9%	183 36,0%	80 15,7%	508 100,0%
	Total	2144 100.0%	3309 100.0%	3731 100.0%	529 100.0%	9713 100.0%
	Highest level of education (2018)					
Male	As a main source of food for the household	137 20,9%	267 40,7%	239 36,4%	13 2,0%	656 100,0%
	As the main source of income/earning a living	18 10,9%	51 30,9%	72 43,6%	24 14,5%	165 100,0%
	As an extra source of income	85 17,7%	176 36,6%	200 41,6%	20 4,2%	481 100,0%
	As an extra source of food for the household	1231 21,3%	2214 38,4%	2135 37,0%	186 3,2%	5766 100,0%
	As a leisure activity or hobby e.g., gardening	86 17,8%	180 37,3%	183 37,9%	34 7,0%	483 100,0%
	Total	1557 100,0%	2888 100,0%	2829 100,0%	277 100,0%	7551 100.0%
Female	As a main source of food for the household	168 20,8%	273 33,8%	342 42,3%	25 3,1%	808 100,0%
	As the main source of income/earning a living	19 11,3%	54 32,1%	80 47,6%	15 8,9%	168 100,0%
	As an extra source of income	102 18,6%	195 35,5%	222 40,4%	30 5,5%	549 100,0%
	As an extra source of food for the household	1439 21,1%	2328 34,2%	2714 39,9%	329 4,8%	6810 100,0%

	As a leisure activity or hobby e.g., gardening	114 21,1%	177 32,7%	202 37,3%	48 8,9%	541 100,0%
	Total	1842 100.0%	3027 100.0%	3560 100.0%	447 100.0%	8876 100.0%

Appendix 13: Use of agricultural products and stockkeeping by employment status and gender

Gender	Use of agricultural products and stockkeeping	Employment status (2015)			
		Employed	**Unemployed**	**Not Economically Active**	Total
Male	As a main source of food for the household	115 28,6%	62 15,4%	225 56,0%	402 100,0%
	As the main source of income/earning a living	56 58,9%	6 6,3%	33 34,7%	95 100,0%
	As an extra source of income	99 34,0%	37 12,7%	155 53,3%	291 100,0%
	As an extra source of food for the household	1038 26,4%	481 12,2%	2415 61,4%	3934 100,0%
	As a leisure activity or hobby e.g., gardening	148 44,4%	38 11,4%	147 44,1%	333 100,0%
	Total	1456 100.0%	624 100.0%	2975 100.0%	5055 100.0%
Female	As a main source of food for the household	122 23,8%	66 12,9%	324 63,3%	512 100,0%

	As the main source of income/earning a living	37 35,9%	5 4,9%	61 59,2%	103 100,0%
	As an extra source of income	72 23,8%	27 8,9%	204 67,3%	303 100,0%
	As an extra source of food for the household	1141 21,5%	499 9,4%	3663 69,1%	5303 100,0%
	As a leisure activity or hobby e.g., gardening	143 37,9%	40 10,6%	194 51,5%	377 100,0%
	Total	1515 100.0%	637 100.0%	4446 100.0%	6598 100.0%
	Employment status (2018)				
Male	As a main source of food for the household	87 23,6%	56 15,2%	225 61,1%	368 100,0%
	As the main source of income/earning a living	68 57,1%	6 5,0%	45 37,8%	119 100,0%
	As an extra source of income	106 33,4%	40 12,6%	171 53,9%	317 100,0%
	As an extra source of food for the household	950 28,2%	501 14,9%	1913 56,9%	3364 100,0%
	As a leisure activity or hobby e.g., gardening	102 32,5%	39 12,4%	173 55,1%	314 100,0%
	Total	1313 100,0%	642 100,0%	2527 100,0%	4482 100.0%
Female	As a main source of food for the household	101 18,7%	80 14,8%	358 66,4%	539 100,0%
	As the main source of income/earning a living	44 33,8%	11 8,5%	75 57,7%	130 100,0%

	As an extra source of income	101 28,0%	41 11,4%	219 60,7%	361 100,0%
	As an extra source of food for the household	1069 23,4%	485 10,6%	3020 66,0%	4574 100,0%
	As a leisure activity or hobby e.g., gardening	123 32,9%	44 11,8%	207 55,3%	374 100,0%
	Total	1438 100.0%	661 100.0%	3879 100.0%	5978 100.0%

Appendix 14: Differentials in of use of agricultural products and stockkeeping by province and gender

Gender	Use of agricultural products and stockkeeping	Province (2015)									
		Western Cape	**Eastern Cape**	**Northern Cape**	**Free State**	**KwaZulu-Natal**	**North West**	**Gauteng**	**Mpumalanga**	**Limpopo**	Total
Male	As a main source of food for the household	10 1,4%	91 13,1%	22 3,2%	52 7,5%	313 45,0%	16 2,3%	60 8,6%	113 16,2%	19 2,7%	696 100,0%
	As the main source of income/earning a living	9 7,0%	10 7,8%	20 15,6%	11 8,6%	13 10,2%	15 11,7%	5 3,9%	22 17,2%	23 18,0%	128 100,0%
	As an extra source of income	4 0,9%	67 14,8%	53 11,7%	20 4,4%	72 15,9%	100 22,0%	21 4,6%	41 9,0%	76 16,7%	454 100,0%
	As an extra source of food for the household	54 0,8%	1832 27,2%	140 2,1%	324 4,8%	1362 20,2%	206 3,1%	177 2,6%	832 12,3%	1810 26,9%	6737 100,0%
	As a leisure activity or hobby e.g., gardening	80 15,2%	105 19,9%	12 2,3%	6 1,1%	163 30,9%	18 3,4%	38 7,2%	72 13,7%	33 6,3%	527 100,0%
	Total	157 100.0%	2105 100.0%	247 100.0%	413 100.0%	1923 100.0%	355 100.0%	301 100,0%	1080 100,0%	1961 100.0%	8542 100.0%

Female	As a main source of food for the household	9 1,1%	120 15,3%	17 2,2%	74 9,4%	344 43,9%	13 1,7%	75 9,6%	113 14,4%	19 2,4%	784 100,0%
	As the main source of income/earning a living	7 4,9%	11 7,6%	20 13,9%	13 9,0%	15 10,4%	17 11,8%	6 4,2%	25 17,4%	30 20,8%	144 100,0%
	As an extra source of income	5 1,1%	78 17,5%	48 10,8%	19 4,3%	61 13,7%	81 18,2%	15 3,4%	56 12,6%	83 18,6%	446 100,0%
	As an extra source of food for the household	63 0,8%	2085 26,2%	169 2,1%	415 5,2%	1586 19,9%	228 2,9%	176 2,2%	950 11,9%	2286 28,7%	7958 100,0%
	As a leisure activity or hobby e.g., gardening	74 14,0%	94 17,8%	17 3,2%	5 0,9%	151 28,7%	20 3,8%	42 8,0%	89 16,9%	35 6,6%	527 100,0%
	Total	158 100.0%	2388 100.0%	271 100.0%	526 100.0%	2157 100.0%	359 100.0%	314 100,0%	1233 100,0%	2453 100.0%	9859 100.0%
	Province (2018)										
Male	As a main source of food for the household	1 0,1%	132 19,6%	9 1,3%	49 7,3%	268 39,8%	17 2,5%	89 13,2%	87 12,9%	22 3,3%	674 100,0%
	As the main source of income/earning a living	8 4,7%	41 24,1%	13 7,6%	9 5,3%	18 10,6%	13 7,6%	7 4,1%	29 17,1%	32 18,8%	170 100,0%
	As an extra source of income	3 0,6%	72 14,7%	46 9,4%	16 3,3%	68 13,8%	66 13,4%	28 5,7%	47 9,6%	145 29,5%	491 100,0%
	As an extra source of food for the household	38 0,6%	1467 25,0%	92 1,6%	306 5,2%	1329 22,7%	154 2,6%	200 3,4%	733 12,5%	1541 26,3%	5860 100,0%
	As a leisure activity or hobby e.g. gardening	33 6,5%	141 27,9%	9 1,8%	7 1,4%	198 39,2%	13 2,6%	31 6,1%	61 12,1%	12 2,4%	505 100,0%
	Total	83 100,0%	1853 100,0%	169 100,0%	387 100,0%	1881 100,0%	263 100,0%	355 100,0%	957 100,0%	1752 100,0%	7700 100.0%
Female	As a main source of food for the household	2 0,2%	144 17,3%	14 1,7%	63 7,6%	332 40,0%	20 2,4%	112 13,5%	113 13,6%	31 3,7%	831 100,0%

	As the main source of income/earning a living	4 2,3%	49 28,3%	14 8,1%	9 5,2%	18 10,4%	14 8,1%	5 2,9%	24 13,9%	36 20,8%	173 100,0%
	As an extra source of income	1 0,2%	63 11,4%	46 8,3%	11 2,0%	87 15,7%	82 14,8%	32 5,8%	72 13,0%	161 29,0%	555 100,0%
	As an extra source of food for the household	43 0,6%	1629 23,6%	94 1,4%	375 5,4%	1567 22,7%	157 2,3%	219 3,2%	845 12,3%	1960 28,5%	6889 100,0%
	As a leisure activity or hobby e.g., gardening	30 5,3%	149 26,4%	20 3,5%	7 1,2%	218 38,7%	15 2,7%	31 5,5%	76 13,5%	18 3,2%	564 100,0%
	Total	80 100.0%	2034 100.0%	188 100.0%	465 100.0%	2222 100.0%	288 100.0%	399 100.0%	1130 100.0%	2206 100.0%	9012 100.0%

Appendix 15: Distribution of use of agricultural products and stockkeeping by geographic type and gender

Gender	Use of agricultural products and stockkeeping	Geographic type (2015)		
		Urban	**Non-Urban**	Total
Male	As a main source of food for the household	206 29,6%	490 70,4%	696 100,0%
	As the main source of income/earning a living	18 14,1%	110 85,9%	128 100,0%
	As an extra source of income	61 13,4%	393 86,6%	454 100,0%
	As an extra source of food for the household	1146 17,0%	5591 83,0%	6737 100,0%
	As a leisure activity or hobby e.g., gardening	199 37,8%	328 62,2%	527 100,0%

	Total	1630 100.0%	6912 100.0%	8542 100.0%
Female	As a main source of food for the household	234 29,8%	550 70,2%	784 100,0%
	As the main source of income/earning a living	16 11,1%	128 88,9%	144 100,0%
	As an extra source of income	52 11,7%	394 88,3%	446 100,0%
	As an extra source of food for the household	1289 16,2%	6669 83,8%	7958 100,0%
	As a leisure activity or hobby e.g., gardening	212 40,2%	315 59,8%	527 100,0%
	Total	1803 100.0%	8056 100.0%	9859 100.0%
	Geographic type (2018)			
Male	As a main source of food for the household	170 25,2%	504 74,8%	674 100,0%
	As the main source of income/earning a living	40 23,5%	130 76,5%	170 100,0%
	As an extra source of income	78 15,9%	413 84,1%	491 100,0%
	As an extra source of food for the household	987 16,8%	4873 83,2%	5860 100,0%
	As a leisure activity or hobby e.g., gardening	117 23,2%	388 76,8%	505 100,0%
	Total	1392 100,0%	6308 100,0%	7700 100.0%

Female	As a main source of food for the household	217 26,1%	614 73,9%	831 100,0%
	As the main source of income/earning a living	38 22,0%	135 78,0%	173 100,0%
	As an extra source of income	87 15,7%	468 84,3%	555 100,0%
	As an extra source of food for the household	1106 16,1%	5783 83,9%	6889 100,0%
	As a leisure activity or hobby e.g., gardening	135 23,9%	429 76,1%	564 100,0%
	Total	1583 100.0%	7429 100.0%	9012 100.0%

Appendix 16: Summary of the exploration of results for agricultural activities

Characteristics	Variables of control	Test statistics- Values and significance 2015			Test statistics- Values and significance 2018		
		Chi-square	Phi	Cramer's V	Chi-square	Phi	Cramer's V
Agricultural activities & Age group	***Gender***	V= 951.149 P= 0.000 P<0.05	V= 0.131 P= 0.000 P<0.05	V= 0.131 P= 0.000 P<0.05	V= 895.798 P= 0.000 P<0.05	V= 0.129 P= 0.000 P<0.05	V= 0.129 P= 0.000 P<0.05
Agricultural activities & population group		V= 2731,266 P= 0.000 P<0.05	V= 0.192 P= 0.000 P<0.05	V= 0.192 P= 0.000 P<0.05	V= 2408.706 P= 0.000 P<0.05	V= 0.185 P= 0.000 P<0.05	V= 0.185 P= 0.000 P<0.05
Agricultural activities & marital status		V= 520.203 P= 0.000 P<0.05	V= 0.084 P= 0.000 P<0.05	V= 0.084 P= 0.000 P<0.05	V= 411.629 P= 0.000 P<0.05	V= 0.076 P= 0.000 P<0.05	V= 0.076 P= 0.000 P<0.05
Agricultural activities & household headship		V= 488.920 P= 0.000 P<0.05	V= -0.081 P= 0.000 P<0.05	V= 0.081 P= 0.000 P<0.05	V= 487.982 P= 0.000 P<0.05	V= -0.083 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05

Agricultural activities & education level		V= 1730.225 P= 0.000 P<0.05	V= 0.155 P= 0.000 P<0.05	V= 0.155 P= 0.000 P<0.05	V= 1611.799 P= 0.000 P<0.05	V= 0.152 P= 0.000 P<0.05	V= 0.152 P= 0.000 P<0.05
Agricultural activities & employment status		V= 2024.094 P= 0.000 P<0.05	V= 0.198 P= 0.000 P<0.05	V= 0.198 P= 0.000 P<0.05	V= 1449.447 P= 0.000 P<0.05	V= 0.171 P= 0.000 P<0.05	V= 0.171 P= 0.000 P<0.05
Agricultural activities & province		V= 12254.028 P= 0.000 P<0.05	V= 0.407 P= 0.000 P<0.05	V= 0.407 P= 0.000 P<0.05	V= 10506.147 P= 0.000 P<0.05	V= 0.385 P= 0.000 P<0.05	V= 0.385 P= 0.000 P<0.05
Agricultural activities & geographic type		V= 19070.757 P= 0.000 P<0.05	V= -0.507 P= 0.000 P<0.05	V= 0.507 P= 0.000 P<0.05	V= 17329.224 P= 0.000 P<0.05	V= -0.495 P= 0.000 P<0.05	V= 0.495 P= 0.000 P<0.05

Statistical tests on agricultural activities and independent variables.

Appendix 17: Summary of the exploration of results for land tenure

Characteristics	**Variables of control**	**Test statistics- Values and significance 2015**			**Test statistics- Values and significance 2018**		
		Chi-square	**Phi**	**Cramer's V**	**Chi-square**	**Phi**	**Cramer's V**
Land tenure & Age group	***Gender***	V= 68.478 P= 0.000 P<0.05	V= 0.084 P= 0.000 P<0.05	V= 0.042 P= 0.000 P<0.05	V= 61.226 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05	V= 0.042 P= 0.000 P<0.05
Land tenure & population group		V= 773.972 P= 0.000 P<0.05	V= 0.235 P= 0.000 P<0.05	V= 0.136 P= 0.000 P<0.05	V= 270.818 P= 0.000 P<0.05	V= 0.147 P= 0.000 P<0.05	V= 0.085 P= 0.000 P<0.05
Land tenure & marital status		V= 98.218 P= 0.000 P<0.05	V= 0.084 P= 0.000 P<0.05	V= 0.042 P= 0.000 P<0.05	V= 76.182 P= 0.000 P<0.05	V= 0.078 P= 0.000 P<0.05	V= 0.039 P= 0.000 P<0.05
Land tenure & household headship		V= 88.377 P= 0.000 P<0.05	V= 0.079 P= 0.000 P<0.05	V= 0.079 P= 0.000 P<0.05	V= 31.050 P= 0.000 P<0.05	V= 0.050 P= 0.000 P<0.05	V= 0.050 P= 0.000 P<0.05
Land tenure & education level		V= 152.811 P= 0.000 P<0.05	V= 0.105 P= 0.000 P<0.05	V= 0.061 P= 0.000 P<0.05	V= 85.051 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05	V= 0.048 P= 0.000 P<0.05
Land tenure & employment status		V= 209.660 P= 0.000 P<0.05	V= 0.154 P= 0.000 P<0.05	V= 0.109 P= 0.000 P<0.05	V= 177.789 P= 0.000 P<0.05	V= 0.051 P= 0.000 P<0.05	V= 0.106 P= 0.000 P<0.05

Land tenure & province		V= 5296.910 P= 0.000 P<0.05	V= 0.614 P= 0.000 P<0.05	V= 0.307 P= 0.000 P<0.05	V= 4459.704 P= 0.000 P<0.05	V= 0.596 P= 0.000 P<0.05	V= 0.298 P= 0.000 P<0.05
Land tenure & geographic type		V= 1376.661 P= 0.000 P<0.05	V= 0.313 P= 0.000 P<0.05	V= 0.313 P= 0.000 P<0.05	V= 1268.788 P= 0.000 P<0.05	V= 0.318 P= 0.000 P<0.05	V= 0.318 P= 0.000 P<0.05

Statistical tests on tenure status of land and independent variables.

Appendix 18: Summary of the exploration of results for use of agricultural products and stockkeeping

Characteristics	Variables of control	Test statistics- Values and significance 2015			Test statistics- Values and significance 2018		
		Chi-square	Phi	Cramer's V	Chi-square	Phi	Cramer's V
Use of agricultural products and stockkeeping & Age group	***Gender***	V= 73.310 P= 0.000 P<0.05	V= 0.075 P= 0.000 P<0.05	V= 0.038 P= 0.000 P<0.05	V= 54.436 P= 0.000 P<0.05	V= 0.068 P= 0.000 P<0.05	V= 0.034 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & population group		V= 2839.226 P= 0.000 P<0.05	V= 0.393 P= 0.000 P<0.05	V= 0.227 P= 0.000 P<0.05	V= 1118.919 P= 0.000 P<0.05	V= 0.259 P= 0.000 P<0.05	V= 0.149 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & marital status		V= 170.899 P= 0.000 P<0.05	V= 0.096 P= 0.000 P<0.05	V= 0.048 P= 0.000 P<0.05	V= 102.794 P= 0.000 P<0.05	V= 0.078 P= 0.000 P<0.05	V= 0.039 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & household headship		V= 284.008 P= 0.000 P<0.05	V= 0.124 P= 0.000 P<0.05	V= 0.124 P= 0.000 P<0.05	V= 97.755 P= 0.000 P<0.05	V= 0.076 P= 0.000 P<0.05	V= 0.076 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & education level		V= 313.827 P= 0.000 P<0.05	V= 0.132 P= 0.000 P<0.05	V= 0.076 P= 0.000 P<0.05	V= 113.674 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05	V= 0.048 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & employment status		V= 177.272 P= 0.000 P<0.05	V= 0.123 P= 0.000 P<0.05	V= 0.087 P= 0.000 P<0.05	V= 87.537 P= 0.000 P<0.05	V= 0.091 P= 0.000 P<0.05	V= 0.065 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & province		V= 3681.310 P= 0.000 P<0.05	V= 0.447 P= 0.000 P<0.05	V= 0.224 P= 0.000 P<0.05	V= 2367.164 P= 0.000 P<0.05	V= 0.376 P= 0.000 P<0.05	V= 0.188 P= 0.000 P<0.05
Use of agricultural products and stockkeeping & geographic type		V= 447.864 P= 0.000 P<0.05	V= 0.161 P= 0.000 P<0.05	V= 0.161 P= 0.000 P<0.05	V= 114.094 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05	V= 0.083 P= 0.000 P<0.05

Statistical tests on use of agricultural products and stockkeeping and independent variables.

Appendix 19: List of variables used, and questions asked in the GHS questionnaire

Data file: Person

Unique number (UqNr) *(@1 18.)*

Unique Household Identifier

Note: This is the unique household identifier, which can be used to link data from this file with data for the same household from other files.

Person number (PersonNr) *(@19 2.)*

Person (respondent) number within household
Valid range: 01–22

Note: The two fields above (unique number and person number) create a 20-digit unique person identifier, which can be used to link data from this file with data for the same individuals from other files.

Primary sampling unit (PSU) *(@21 11.)*

Note to users
The PSU numbers are unique within DCs.

Valid range: 16010072000–98710651000

Province (Prov) *(@32 1.)*

South African provinces according to the provincial boundaries as demarcated in December 2005.

Final code list
1 = Western Cape
2 = Eastern Cape
3 = Northern Cape
4 = Free State
5 = KwaZulu-Natal
6 = North West
7 = Gauteng
8 = Mpumalanga
9 = Limpopo

(@33 1.)

Final code list
1 = Yes

Gender (Gender) *(@34 1.)*

C	**Is ..... a male or a female?** 1 = Male 2 = Female

Note to users
This question is asked for each household member to determine his or her gender. This question, and all consequent questions, are applicable only if there is a 'Yes' answer in the previous question, which determines whether a person is a household member or not. The survey officers are instructed not to assume the gender of the members of the households by just looking at people's names or physical appearances, but to make identification according to the respondent's answer to the question.

Universe
Every person who has stayed in the household in the selected dwelling unit at least four nights per week in the four weeks prior to the interview.

Final code list
1 = Male
2 = Female

Age (Age)

D	**What is .....'s date of birth and age in completed years?** **Day of birth:** *Example of day 05* **Month of birth:** *Example of month 11* **Year of birth:** *Example of year 2007* **Age in years** *Less than one year = 0*

(@35 3.)

Note to users
This question is asked to find out the ages and dates of birth of the household members. Concerning the date of birth, the survey officers were requested to confirm the date from documentation if the respondent did not know the date of birth. The question starts with *Day of birth*, then the *Month of birth* and finally the *Age in years*. For *Month of birth* the equivalent is given in numbers, i.e. January is represented with 01, February with 02 and so forth. The *Year of birth* is given as a four-digit number, e.g. 1933 or 1996.

The instruction for *Age in years* is to write the years in whole numbers and not in words. Moreover, these years must be complete years; thus if a person is two years and six months, the instruction is to write the two completed years. For those children who are less than a year, the instruction is to write 00.

Universe
Every person who has stayed in the household in the selected dwelling unit at least four nights on average per week in the four weeks prior to the interview.

Final code list
Less than 1 year =0
Valid range: 0–108
Age group
(Age_grp1) (@382.)

Final code list
01 = 00–04 years
02 = 05–09 years
03 = 10–14 years
04 = 15–19 years
05 = 20–24 years
06 = 25–29 years
07 = 30–34 years
08 = 35–39 years
09 = 40–44 years
10 = 45–49 years
11 = 50–54 years
12 = 55–59 years
13 = 60–64 years
14 = 65–69 years
15 = 70–74 years
16 = 75+
17

Population group (Race) *(@40 1.)*

E	What population group does ..... belong to?
	1 = Black African
	2 = Coloured
	3 = Indian/Asian
	4 = White
	5 = Other *(specify in box below)* 6 = REFUSE

Note to users
This question is asked to determine the population group of household members from the selected dwelling. The respondent must answer for each member without any assumptions. In this instance, survey officers are also instructed not to make any conclusions that may be influenced by their observation or using people's names during the interview, as some names may be unisex (e.g. Anele is one example). This question may also be very sensitive to some respondents, especially in this post-apartheid era, but it is really important to find out what the composition of the South African population is.

Universe
Every person who has stayed in the household in the selected dwelling unit at least four nights on average per week in the four weeks prior to the interview.

Final code list
1 = African/Black
2 = Coloured
3 = Indian/Asian
4 = White

Section 1: Household-specific characteristics

Marital status (Q12aMARST) *(@47 1.)*

1.2a	**What is ……'s present marital status?** 1 = Legally married (include customary, traditional, religious, etc.) 2 = Living together like husband and wife/partners 3 = Divorced 4 = Separated, but still legally married 5 = Widowed 6 = Single, but have been lived together with someone as husband/wife before 7 = Single and have never been married/never lived together as husband/wife before

Go to Q1.3a

Note to users
This question is about the marital status of the members of the household. Both civil and traditional marriages are considered in this question. Options 6 and 7 are similar in that they both refer to individuals who are single. However, the distinguishing factor is individuals who may have lived together with someone as husband/wife before.

If the response is 'widowed', 'divorced', 'separated, but still legally married', 'single, but have been living together with someone as husband/wife before' or 'single and have never been married/never lived together as husband/wife before', the survey officer is instructed to go to Q1.3a.

Universe
Every person who has stayed in the household in the selected dwelling unit at least four nights on average per week in the four weeks prior to the interview.

Final code list
1 = Legally married
2 = Living together like husband and wife/partners

3 = Divorced
4 = Separated, but still legally married
5 = Widowed
6 = Single, but have lived together with someone as husband/wife before
7 = Single and have never been married/never lived together as husband/wife before 9 = Unspecified

Highest education level (Q15HIEDU) *(@61 2.)*

1.5	**What is the highest level of education that ..... has successfully completed?** *Diplomas or certificates must be of at least six months plus study duration full time (or equivalent) to be included* 98 = No schooling 00 = Grade R/0 01 = Grade 1/Sub A/Class 1 02 = Grade 2/Sub B/Class 2 03 = Grade 3/Standard 1/ABET/AET 1 04 = Grade 4/Standard 2 05 = Grade 5/Standard 3/ABET/AET 2 06 = Grade 6/Standard 4 07 = Grade 7/Standard 5/ABET/AET 3 08 = Grade 8/Standard 6/Form 1 09 = Grade 9/Standard 7/Form 2/ABET/AET 4/NCV Level 1/Occupational Certificate – NQF Level 1 10 = Grade 10/Standard 8/Form 3/NCV Level 2/Occupational Certificate – NQF Level 2 11 = Grade 11/Standard 9/Form 4/NCV Level 3/Occupational Certificate – NQF Level 3 12 = Grade 12/Standard 10/Form 5/National Senior Certificate/Matric/NCV Level 4/Occupational Certificate – NQF Level 4 13 = NTC I/N1 14 = NTC II/N2 15 = NTC III/N3 16 = N4/NTC 4/Occupational Certificate – NQF Level 5 17 = N5/NTC 5/Occupational Certificate – NQF Level 5 18 = N6/NTC 6/Occupational Certificate – NQF Level 5 19 = Certificate with less than Grade 12/Standard 10 20 = Diploma with less than Grade 12/Standard 10 21 = Higher/National/Advance certificate with Grade 12/Std 10/Occupational Certificate – NQF Level 5 22 = Diploma with Grade 12/Standard 10/Occupational Certificate – NQF Level 6 23 = Higher Diploma/Occupational Certificate (B-Tech Diploma) – NQF Level 7 24 = Post Higher Diploma (Master's Diploma and Master's Degree) – NQF Level 9 25 = Bachelor's Degree/Occupational Certificate – NQF Level 7 26 = Honours Degree/Postgraduate Diploma/Occupational Certificate – NQF Level 8 27 = Doctoral Degrees (Doctoral Diploma and PhD) – NQF Level 10 28 = Other 29 = Do not know

Note to users

Survey officers are instructed that it is only those qualifications already obtained that must be entered. That means the current level, whereby a person is still busy with the studies, is not applicable. It is very important to complete each record even if the person has not attended school. Moreover, survey officers are instructed that diplomas and certificates must be of at least six months' duration.

Section 3: Social security

Geography Type (geotype) *(@241 1.)*
Classification according to the settlement characteristics.

Final code list
1 = Urban
2 = Traditional
3 = Farms

Employment status one (employ_Status1) *(@254 1.)*

Note to users
Based on Q4.1 to Q4.6d.

Universe
All individuals aged 15 years and older.

Final code list
1 = Employed
2 = Unemployed
8 = Not applicable
9 = Unspecified

Employment status two (employ_Status2) *(@255 1.)*

Note to users
Based on Q4.1 to Q4.6d.

Universe
All individuals aged 15 years and older.

Final code list
1 = Employed
2 = Unemployed
3 = Not economically active
8 = Not applicable

Section 5: General household information and service delivery

Data file: House

Province (Prov) *(@32 1.)*

South African provinces
According to the provincial boundaries as demarcated in December 2005.

Final code list
1 = Western Cape
2 = Eastern Cape
3 = Northern Cape
4 = Free State
5 = KwaZulu-Natal
6 = North West
7 = Gauteng
8 = Mpumalanga
9 = Limpopo

Population group of household head (head_popgrp) *(@33 1.)*

Final code list
1 = African/Black
2 = Coloured
3 = Indian/Asian
4 = White

Sex of household head (head_sex) *(@34 1.)*

Final code list
1 = Male
2 = Female

Age of household head (head_age) Valid range: 12–108 *(@35 3.)*

Section 8: Household livelihoods Agricultural activities

Agricultural activities (Q81Agri) *(@303 1.)*

8.1	**Has the household been involved in the production of any kind of food or agricultural products during the past 12 months? (e.g. livestock, crops, poultry, food gardening, forestry, fish, etc.)** 1 = Yes 2 = No → ***Go to Q8.9a***	☐ 1 ☐ 2

Note to users
Note the skip instruction to Q8.9a for those who are not involved in food or agricultural production.

Universe
All households in the selected dwelling units.

Final code list
1 = Yes
2 = No

9 = Unspecified

Agricultural activities (Q82aNAgri) *(@304 2.)*

8.2a	**How many household members, aged 15 years or older, were involved in these agricultural activities, even if only once in a while?** ☐☐

Note to users
The question serves to determine how many members who are 15 years and older were involved in agricultural activities.

Universe
Household members aged 15 years and older in the selected dwelling units.

Final code list Valid
range: 1–22
Not applicable: 88
Unspecified: 99

Use of agricultural products and stock keeping (Q84Use) *(@318 1.)*

8.4	**Why do you grow farm produce or keep stock for the household?** 1 = As a main source of food for the household 2 = As the main source of income/earning a living 3 = As an extra source of income 4 = As an extra source of food for the household 5 = As a leisure activity or hobby, e.g. gardening	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Note to users
The purpose of this question is to determine the reason for growing farm products and keeping stock.

Universe
All households in the selected dwelling units that were involved in the production of any kind of produce over the past 12 months.

Final code list
1 = As a main source of food for the household
2 = As the main source of income/earning a living
3 = As an extra source of income
4 = As an extra source of food for the household 5 = As a leisure activity or hobby, e.g. gardening
8 = Not applicable
9 = Unspecified

Agriculture-related assistance from any entity other than government (Q86CAnyASSIST) (@330 1.)

8.6c	**Did your household receive agriculture-related assistance from any entity other than government?** 1 = Yes 2 = No	☐ 1 ☐ 2

(@360 1.)

Note to users

The purpose of this question is to determine if the household found any kind of agricultural assistance from any entity other than government for the agricultural products they produce.

Size of the land that the household uses (Q88bHect) *(@362 2.)*

8.8b	**Approximately how big is the land that the household uses for production? Estimate total area if more than one piece.** 1= Less than 5 000 m² (approximately one soccer field) 2= 5 000 m² to 9 999 m² (between one soccer field and one hectare) 3 = 1 but less than 2 hectares 4 = 2 but less than 5 hectares 5 = 5 but less than 10 hectares 6 = 10 but less than 20 hectares 7 = 20 or more hectares 8 = Do not know	☐

All households in the selected dwelling units that were involved in the production of any kind of produce over the past 12 months.

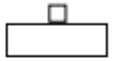
Final code list
1 = Yes
2 = No
8 = Not applicable
9 = Unspecified

Note to users
The purpose of this question is to establish the size of the land that is used for agricultural production. Respondents are encouraged to estimate the land if more than one piece of land is used.

Universe
All households that were involved in the production of any kind of food or agricultural products in the past 12 months.

Final code list
1 = Less than 5 000 m^2 (approximately one soccer field)
2 = 5 000 m^2 to 9 999 m^2 (between one soccer field and one hectare)
3 = 1 but less than 2 hectares
4 = 2 but less than 5 hectares
5 = 5 but less than 10 hectares
6 = 10 but less than 20 hectares
7 = 20 or more hectares
8 = Do not know
88 = Unspecified
99 = Not applicable

Tenure status of land (Q88cTenu) *(@364 2.)*

8.8c	**On what basis does this household have access to the land used for crop production? If more than one kind of tenure system applies for different pieces of land, give an answer for the largest piece.** 1 = Owns the land 2 = Rents the land 3 = Sharecropping 4 = Tribal authority 5 = State land 6 = Other (specify) 7 = Do not know	

Note to users
This question seeks to establish how households have access to the land used for crop production.

Universe
All households that were involved in the production of any kind of food or agricultural products in the past 12 months.

Final code list
1 = Owns the land
2 = Rents the land
3 = Sharecropping
4 = Tribal authority
5 = State land
6 = Other
7 = Do not know
88 = Not applicable
99 = Unspecified