Effectiveness of Agri-Park Intervention Strategy towards the Rural Economy Transformation in the North West Province

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DECLARATION

I, Maruli Mukhethwa , declare that this dissertation is my work and to the best of my knowledge, it has not been previously submitted or published by another person (except where explicitly defined in the acknowledgements), and it has not been submitted for the award of any degree at another university.

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I, Maruli Mukhethwa, student number 38579472, hereby declare that I am fully aware of the NWU's policy on plagiarism, and I have taken every precaution to comply with the regulations.

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DEDICATION

I would like to dedicate this work to the greatest Warrior, God Almighty that I serve; for grace, strength and courage to work very hard towards my journey to accomplish this dissertation. I dedicate this study to my family (Maruli), for believing in the value and foundation of the education system.

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ABSTRACT

Lack of access to market , low productivity, inadequate access to credit, poverty and food insecurity were common challenges affecting smallholder farmers in South Africa. Since 1994, the South African government has been concerned about these issues. As a result, several programmes, including Agri-Parks have been implemented to address smallholder farmers' challenges. Debatably, the effectiveness of this programme has not been studied. Therefore, the main aim of this study was to assess the existing Agri-Park model's effectiveness in transforming the rural economy. Specifically, the objectives of the study were: to assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub), identify and highlight socio-economic factors affecting farmers to participate in the Agri-Park mandate and measure the direct and indirect benefits of the Agri-Park programme in the North West province. Data were collected in three selected districts of the North West province. Stratified random sampling was used to select 128 smallholder farmers in the study area.

Descriptive results indicated that the majority of smallholder farmers were male 58%, while only 42% were female. From the thematic analysis results, eleven themes emerged, which are the mobilisation process; infrastructure; locality; sustainability; productivity (food security), rural economy transformation (ownership); job creation, farmers' production support unit (Agri-hub) status; mechanisation; Government funding and challenges of the implementation process. One of the results is a pointer to the main challenges faced by Agri-Park programme mechanisms, that is, how the programme interventions, such as budget constraints, coordination and implementation measures, are coordinated and rolled out. Hence, the Agri-Park programme is not fully supporting smallholder farmers with the market to maximise their livelihood and income. In addition, the programme is operating at a slow pace that was not anticipated because there was a timeframe allocated for every milestone in the programme.

The results from the probit model indicate that variables, such as gender, age, education level, access to training, market access, farming experience, hectares produced, specialised commodity and distance to Agri-Park, had the greatest influence in determining the farmers' participation in Agri-Park programme. Variables of gender, farming experience and hectares produced were statistically significant at

10% and the variables of age, level of education, specialised commodity and distance to Agri-park were statistically significant at 5% level. Access to training was statistically significant at 1% level. Furthermore, other variables, such as marital status, employment status, household size, access to transport, access to marketing information, access to credit, and off-farm income were not significant in explaining the smallholder farmers' participation in the Agri-Park programme.

The results from the Propensity Score Matching model indicate that the estimates for the average smallholder farmers' income earned from Agri-park participation range from 6715.30 to 6297.60, depending on the matching method used. The study was designed to compare two groups, the treated and control group, to assess the impact of the programme. In addition, the Propensity Score Matching Model, using the Nearest Neighbour and Kernel Matching Methods of the outcome variables, total farm/project income, indicates a positive and statistically significant result at $p < 0.05\%$ level.

These results provide insights into addressing the question about the appropriate developmental path for transition from the Agri-Park programme. The continuously comprehensive support to smallholder farmers in the form of funding, production inputs, mechanisation, extension services and access to market through Agri-Parks is needed to enhance income and food security.

Keywords: Agri-Park; smallholder farmers; rural economy; transformation; market access; North West

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LIST OF ACRONYMS

AAMP	Agriculture and Agro-Processing Master Plan
ABET	Adult Basic Education and Training
AC	Agro-Based Cluster
AfDB	African Development Bank
Agri-Biz	Agricultural Business Chamber of South Africa
AH	Agri-Hub
AP	Agri-Parks
ATE	Average Treatment Effect
ATT	Average Treatment Effect on the Treated
APAP	Agricultural Policy Action PlanCOVID-19 Coronavirus Disease 2019
COGTA	Department of Cooperative Governance and Traditional Affairs
CRDP	Comprehensive Rural Development Programme
CSIR	The Council for Scientific and Industrial Research (CSIR)
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DAPPOT	District Agri-Parks Operational Task Team
DDM	District Development Model
DARD	Department of Agriculture, and Rural Development
DLRC	District Land Reform Committee
DFS	Development Finance System
DLR	Department of Land Reform
DPME	Department of Performance, Monitoring and Evaluation
DR RSM	Dr Ruth Segomotsi Mompati District
DRDLR	Department of Rural Development and Land Reform
FAO	Food and Agriculture Organisation
FPSU	Farmers Production Support Unit
GDP	Gross Domestic Product
IPAP	Industrial Policy Action Plan
LED	Local Economic Development
NAMC	National Agricultural Marketing Council
NDP	National Development Plan

NGP	New Growth Path
MACE	Mahindra Consulting Engineers Limited
MS	Management Support
MTSF	Medium Term Strategic Framework
PSM	Propensity Score Matching
REID	Rural Enterprise and Industrial Development
R&D	Research and Development
RID	Rural Infrastructure and Development
RUMC	Rural Urban Market Centres
SA-APP	South Africa- Agri-Park Program
SAPs	Sustainable Agricultural Practices
SAPZ	Special Agro-Industrial Processing Zone
SEZs	Special Economic Zones
SOP	Standard Operating Procedure
SPSS	Statistical Package for Social Scientist
SSA	Sub-Saharan Africa
STATA	Statistical Software Package
Stats SA	Statistical South Africa
WEF	Water Energy Food

CHAPTER 1

INTRODUCTION

1.1 Background of the study

The South African government, through the Department of Rural Development and Land Reform (DRDLR), has an ongoing commitment to building sustainable rural livelihoods that align the department's work with Chapter 6 of the National Development Plan (NDP, 2012). The NDP and the framework set out that sustainable rural livelihoods depend on integrated spatial planning, land administration, land reform, as well as sustainable rural enterprises and industries, among other things (DRDLR, 2015). The DRDLR focused on its role in the revitalisation of agriculture and the agro-processing value chain through the Agri-Parks programme, which would be contributing to the priorities outlined in the State of Nation Address held in 2015 (Zuma, 2015) to promote growth in the agricultural sector. Primarily, the intention to grow the sector focused on ensuring that there was growth in the agro-processing part, growth in the sector as a whole and creation of more jobs.

The role of government was mainly based on the provision of services, which ranged from farmers' support, capacity building, extension services and support to market access. In comparison with other countries, DAFF (2013) attested that South Africa provided the lowest support to producers. This was not good for the growth of the economy, as it was one of the important areas that had to be worked on, otherwise, all other efforts would become futile. The key challenges were high input costs, poverty, food insecurity and unsustainable livelihoods, as common challenges encountered by many people living in remote areas of many developing countries, especially those in Sub-Saharan Africa (SSA) (Baiphethi & Jacobs, 2009; Food and Agriculture Organisation, 2016). Most, if not all, of these challenges, are a result of relatively low and unsustainable household income and the inability to secure stable jobs (unemployment). The latter has now become chronic in South Africa. The country's unemployment rate in 2007 was reported at 25.5 %, and over ten years later, it is reported at 32.7 % (Statistics South Africa, 2022).

The Agri-Parks had been proposed as one of the interventions to ensure development and growth in rural enterprise and industrial development. The Agri-Park model, as a new concept in South Africa, was established as part of transforming the rural economy, but the model elements were derived from already existing models locally and worldwide. The models include “educational/experimental farms, collective farming, farmer-incubator projects, Agri-clusters, Eco-villages, urban-edge allotments and markets gardens” (DRDLR, 2015). In South Africa, the Agri-Parks model was launched in 2015, as the pillar of rural economic transformation in the agriculture sector by the Department of Rural Development and Land Reform (DRDLR). The model was aligned with the Comprehensive Rural Development Programme (CRDP) mandates, which prioritised the growth in rural development in terms of providing basic human needs (DRDLR,2015). Furthermore, the programme was aligned to ensure job creation, rural enterprise and rural agro-industries development sustained by rural market accessibility. The CRDP programmes were not supporting farmers enough with markets, funds and the agro-processing system (DRDLR, 2015). Agri-Parks are designed to support rural enterprises, develop rural industries and facilitate the efficient movement of rural produce to markets (DRDLR, 2015).

In South Africa, agriculture is viewed as one sector that has the potential to enhance economic progress because it is mostly practised in rural areas. Gomala and Baluchamy (2018) and Boshoff and Fourie (2020) confirmed that agriculture is the main driver of rural economic development and the backbone of South Africa’s economy, therefore, it is a primary source of income at the household level in most developing countries. Thus, this is in line with World Bank (2020) which reported that agriculture is a powerful tool in the world to boost economic growth.

Policymakers have realised the potential of the agriculture sector in ensuring food security and jobs, as a result, Agri-Parks was initiated. In the financial year, 2015/2016, the government through the DRDLR introduced the Agri-Parks programme, specifically for beneficiaries whose projects are in distress (DRDLR, 2015). Agri-Parks was introduced with the following objectives:

- Supports rural enterprises system (agro-production, processing, logistics, marketing, training and extension services in district municipalities and developments on underused land),

- Develops rural industries and facilitates the efficient movement of rural produce to markets. Increases in smallholder agricultural productivity and new jobs are created in the agricultural sector, leading to a reduction in rural poverty and unemployment (FPSU),.
- Supports smallholder farmers by providing capacity-building, mentorship, farm infrastructure extension services, production and mechanisation inputs,
- Evokes a traditional model of an agricultural business park or hub, where multiple tenants and owners operate under a common management structure,
- Provides networks of contacts between producers' markets and processors, as well as the physical infrastructure required for transforming the industry.

Agri-Parks were viewed by Page and Chauke (2016) as a "vehicle that will kick-start rural economic transformation and encourage the growth of the smallholder farming sector''. This is so because agriculture has been perceived as slowly progressive due to low resource provision, including formal market access, livestock auctions, skills transferred and infrastructure development. There is no doubt that there would be a positive outcome from the intervention of Agri-Parks in creating a breath of new life in South African rural communities, generating more employment and contributing to food security. According to Crosby et al. (2017), Agri-Park is regarded as "a one-stop shop for agro-production support, processing, logistics, marketing and training within the district municipalities''. The study also discovered that apart from providing smallholder farmers with market access and other benefits of the programme, Agri-Parks would also provide an important aspect, such as ownership and control in the value chain process. Furthermore, the rationale for Agri-Parks acts as a catalyst to develop rural areas in bringing market access and maintaining agri-business amongst smallholders and emerging farmers.

According to DRDLR (2015), the Agri-Park model is similar to the Agro-based clusters model, which is in countries such as South America and Asia (Mexico, India, Netherlands, Brazil, China and Colombia). Agro-based clusters have been reported as central in addressing socio-economic challenges and evidence showed that they serve as the sources of employment and income generation, as markets are more accessible (Nogales, 2010). Furthermore, the evidence showed that the model promotes the agro-

processing of raw materials and attracts investments, especially within the rural economy.

According to Chapter 6 of the National Development Plan (NDP, 2012), the primary economy in rural areas is focused on agricultural development. Agri-Parks are expected to contribute to the government's targets of creating one million new jobs and one million hectares of under-utilised land into full production in the agriculture sector by 2030 (NDP, 2012). Furthermore, Agri-Parks are expected to contribute to decreasing rural unemployment from 49% to less than 40% by 2030 (NDP, 2012). Besides, over the medium term, R2.9 billion was allocated for the Rural Infrastructure Development sub-programme within the Department (DRDLR), which constitutes 9.2% of the department's budget (DRDLR, 2015).

According to DRDLR (2015), the Department of Rural Development and Land Reform interventions centre focuses on increasing investment and capacity in rural infrastructure to support production and market opportunities. Hence, the DRDLR (2015) ensured the entire agricultural value chain established Mega Agri-Parks in each of the 44 poorest district municipalities and 27 Farmer Production Support Units (FPSU) within districts. The government allocated/invested the first budget, R2 billion in the financial year 2015/16, and the government is still expected to contribute to Agri-Parks mandates over the next 10 years to maintain sustainability (DRDLR, 2015).

In the past two years, government has worked on aligning its programmes to the Agriculture and Agro-processing Masterplan (AAMP), including Agri-parks. During the budget vote speech on 12 May 2022, the Minister of Agriculture, Land Reform and Development, Thoko Didiza, including social partners launched the signing of the AAMP in Parliament. The mandate of the AAMP was to ensure "globally competitive agricultural and agro-processing sectors driving market oriented and inclusive production to develop rural economies, ensure food-security, and create employment and entrepreneurial" It aims to promote inclusive growth, competitiveness, transformation, employment, and food security (AAMP, 2022).

According to Mthombeni et al.(2022), discovered that small-scale crop farmers trained with high knowledge in processing and skills are pre-disposed to adopting processing as a strategy of making their processed products penetrate the agro-processing market. Futhemore,it will be advantageous for AAMP to be aglined to Agri-Parks mandate, in order to provide more platform for farmers to participate in agro-processing.

1.2 Statement of the problem

Market access, low productivity, credit, poverty and food insecurity are common challenges affecting smallholder farmers in South Africa. Studies conducted by Kreuser and Newman (2018) and Aterido et al. (2019) indicated that productivity growth has been slow and appears to be slowing and inequality remains very high (Wittenberg, 2017), thus resulting in the situation of the South African economy being unsustainable. According to Stats SA (2022), the unemployment level in South Africa is at the rise to 32.7% in Quarter 4 of 2022, hence, 49% of the population above the age of 18 falls below the upper-bound poverty line. This is most evident in rural areas where there is under-development, people lack job opportunities, and there is a lack of agricultural services due to the Coronavirus disease 2019 pandemic. Most people are living below the poverty line. The majority of lowest income earners are rural black women and many small-scale/ subsistence agricultural producers. According to data released by Stats SA (2020), the Gross Domestic Product (GDP) has decreased by 51% in the second quarter of 2019, catapulting South Africa's economy into a recession.

This is despite the introduction of various policies and programmes, such as the "Land reform programme comprising tenure reform, land redistribution and restitution, a Massive Food Production Programme, the Micro Agricultural Financial Institution of South Africa (MAFISA) and the Comprehensive Agricultural Support Programme (CASP) among several others''. Sadly, these efforts have not yielded the expected outcomes, and therefore poverty has deepened (Christian, 2017).

The Department of Agriculture Forestry and Fisheries (DAFF, 2013) reported that approximately 220 000 smallholder farmers or producers in South Africa are faced with challenges in their farming businesses. These are mostly black rural farmers, and their challenges are linked to physical, economic and social inaccessibility to mention a few. They are lacking in basic needs and services, including land ownership, water system, proper farm infrastructures, mechanisation, various production inputs, formal market, extension services, information, training and access to credit, to mention a few.

A study conducted by Ripley (2017) discovered that smallholder farmers often lack access to profitable, value-added markets and this results from a lack of comprehensive supporting functions, such as infrastructure and service provision. In addition, most farmers struggle to change from subsistence to commercial status and sell more

productive products to formal markets. Therefore, it leads to restriction of economic development, lowers the production level and thus leads to smallholder farmers not bearing income. Hence, these limitations lead most rural smallholder farmers not to able to participate in the entire value chain together with big agri-business markets at local, national and global levels.

According to Maponya et al. (2015), smallholder farmers' market participation is low due to many hindering factors, such as a lack of market access, a lack of access to market information, poor technology adoption and inferior infrastructure in rural areas. Furthermore, it was emphasised that the most limiting constraint faced by farmers is linked to poor market access and participation (Maponya et al., 2016). Therefore, there is no doubt that is very crucial for smallholder farmers to have a centred place where services are provided for smallholder farmers to effectively participate in rural markets.

According to NDP (2012), the “traditional approach to rural development and improving agricultural income in poor countries is to help farmers move up the value chain by supporting agro-processing”. Yet, in South Africa, a highly centralised, vertically integrated agro-processing sector already exists for staple foods like maize and cereal (DAFF, 2013). Those value chains tend to dismiss small, new farmers' entrance, hence, the mandate for small-scale manufacturing and agro-processing aiming at local consumers in deprived communities is limited (NDP, 2012; Neves, 2020). What is clear is that the de-concentration of the agricultural value chain is critical in producing rural economic transformation. According to DRDLR (2015), Agri-Parks will help remove barriers to entry and participation of smaller rural producers in the value chain. The strategy will advance producers beyond the farmgate, to storage, processing, marketing and value chains. The Agri-Park will facilitate de-concentration by spurring the development of economic and social infrastructure, shifting the location of value-adding activities into rural areas, enabling more local control over resources and decision making in line with the priorities and needs of rural communities, and this will create benefits to local farmers (DRDLR, 2015).

A study conducted by Mmbengwa et al. (2018) uncovered that the establishment of markets must be the priority to support the participation of smallholder farmers in agro-processing, and the Agri-Parks model is one of the initiatives that seem to have the potential in ensuring the involvement of farmers in the agro-processing value chain. The

same study also discovered that market access linkages should be a second priority to guarantee that farmers can participate in the created market. Besides, Mmbengwa et al. (2018) proved that the market is the key; it requires efforts to ensure farmers are participating and benefiting.

Dispite being a well-positioned to deliver on the transformation process, the private sector is often limited by disintegrations. Hence there is a need for private sector to intervenes with the divisions in commodity and farmers orgarnasitions and create a platform with an alignment goal to ensure partnership exist and successful public-private partnerships. According to AAMP (2022), the private sector should play a role, where public-private-partnership structured finance to help meet development goals towards industries such as Agri-hubs and rural urban market centres.

Based on international studies, Scheitjman et al. (2004) reported that the conception of a permittable environment can increase the provision of resources and access to markets. Agri-Parks should be a successful programme for enhancing the productivity level and minimises the farmers' expenditures while maximising the worth of smallholder farmers' livelihood. Therefore, it is significant to have an operational facility that can serve as a centre location for smallholder farmers to participate in the agricultural value chain process. This study saw a gap that required an in-depth assessment to investigate the overall impact of the Agri-Park interventions on market access amongst smallholders, which may result in rural economic transformation.

This study attempted to respond to the following question "Are Agri-Park interventions an effective model in transforming the rural economy?" The follow-up question that was assessed was "Is Agri-Park fully operational or functioning to support the growth of smallholder farmers in accessing the markets?". The study provided an insight into this less studied mandate in the agricultural sector by electing and evaluating the effectiveness of the Agri-Park interventions in transforming the rural economy and analysing smallholders' socio-economic factors affecting their participation in the Agri-Park mechanisms. In this way, rural unemployment, poverty, food insecurity, and a lack of market access will be reduced as the effectiveness and operationalisation of Agri-Park will be sharpened, as it plays a role in transforming the rural economy.

1.3 Main Research Question/Hypothesis

How do Agri-Park interventions, such as Agri-hubs and Farmers' Production Support Unit centres influence rural economic transformation (market growth) of smallholders in the North West Province?

1.4 Research Questions

- How are the Agri-Park interventions (FPSU & Agri-Hub) implemented in the North West province?- What are the socio-economic factors affecting farmers' participation in the Agri-Parks mandate in the North West province?

- What are the direct and indirect benefits of Agri-Parks (FPSU) for smallholder farmers in the North West province?

1.5 Research Objectives

- To assess the implementation of the Agri-Parks interventions (FPSU & Agri-Hub) in the North West province.
- To identify and highlight the socio-economic factors affecting farmers to participate in the Agri-Park mandate in the North West province.
- To measure the direct and indirect benefits of the Agri-Park programme in the North West province.

1.6 Purpose of the study

The main objective of the study was to assess the existing Agri-Park Model's effectiveness in transforming the rural economy and how the model improved access to the market by rural smallholder farmers in the North West province. This study was conducted to discover the importance of support or investment made by DRDLR towards the goal of promoting vibrant, equitable, sustainable rural communities and enhancing agricultural production and market efficiency.

1.7 Significance of the study

The outcomes of this study will be useful to policymakers and stakeholders, as it discusses perceptions and realities of the farming community with regards to improving agricultural basic services (market access, agro-processing and mechanisation). The outcomes of this study will contribute to the knowledge of the existing Agri-Parks policy, which supports the creation of a connection of rural agricultural projects across South Africa. Hence, the trust is to promote farming as a key to agrarian transformation and compressive rural areas' growth.

The study will assist policymakers on how the impact of Agri-Park is contributing to the South African agricultural sector. It will also give insight into the less studied mandate of the Agri-Park model, which is associated with transforming the rural economy through skilled smallholder farmers or producers, and the increased use of under-utilised communal land and land reform farms into full production. This will increase agricultural productivity, leading a sector in producing enough food security, job creation and market sales.

The study will boost values of coordination, governance and knowledge management, leading to an efficient and accountable of Agri-Park programme. The study will also boost academics, researchers and DRDLR officials with the information to strengthen partnerships, private investment and market linkages, leading to an increased transformation of previously disadvantaged individual farmers in the agricultural sector.

1.8 Delimitation/Scope of study

This study sought to assess the existing Agri-Park Model's effectiveness in transforming the rural economy and how the model improved access to the market by rural smallholder farmers in the North West province. The study focused on smallholder farmers producing different commodities (mixed crops and livestock) in the North West Province, South Africa. This means that the results and conclusions made at the end of the study are from elected parts within the North West Province, such as DR Ruth Segomotsi Mompati District, Ngaka Modiri Molema District and Bojanala Platinum District.

1.9 Definition of key terms

a) DRDLR (2015) defines "**Agri-Park** as: a networked innovation system of agro-production, processing, logistics, marketing, training and extension services located in a district municipality. As a network, it enables a market-driven combination and integration of various agricultural activities and rural development transformation services".

The Agri-Park compromises three distinct but interconnected basic components including:

- "The **Farmer Production Support Unit (FPSU**), which is a rural smallholder farmer's outreach and capacity building unit that links farmers with the markets. The FPSU does the primary collection, provides some storage, does some processing for the local market and provides extension services, including mechanisation (with more than one FPSU per district)" (DRDLR, 2015).

- "The **Agri-hub (AH),** which is a production, equipment hire, processing, packaging, logistics, innovation and training unit. Agri-hub (AH) is in the central processing, packaging, logistics, innovation and training unit. To be in central places within a district municipality, the AH is the main unit responsible for promoting value chains and agro-processing'' (DRDLR, 2015).

- ''The **Rural Urban Market Centre (RUMC),** which is in the periphery of large urban areas, shared by several Agri-Parks (both FPSU and AH provide inputs"' The RUMC is also an information nerve centre for the Agri-Park and facilitates information flow between the market and producers (DRDLR, 2015).

- **Smallholder farmers:** are "associated based on farm size, however, farm size alone is not always a criterion for categorising these farmers" (Ntlou, 2016). The smallholder farmers are defined in various contexts as the following; "small-scale farmers, resource-poor farmers, subsistence farmers, peasant farmers, emerging farmers and household food security farmers'' (DAFF, 2012). This study will adopt the definition of smallholder farmers as those farmers with limited resources and owning small-based plots of land.

- **Market access:** Literature uses various definitions of market access, and the study will adopt the term market access for smallholder farmers as farmers can participate in Agri-Parks (one-stop-shops), where farmers will be able to receive opportunities to sell and purchase in bulk as secondary co-operatives within district municipalities, in Agri-hubs and participate in Farmer Production Support Units centres as well.

- **Economic Sustainability:** "Economic sustainability is defined as the use of various strategies for employing existing resources optimally to allow the organisation to continue functioning profitability over the period of time" (Brower, 2011; Ntlou, 2016).

- **Operationalisation:** According to DRDLR (2015), the study adopts the concept operationalisation of the project towards the Agri-Park model, as the project is operational when Farmer Production Support Units, Agri-hub and Rural Urban Market Centres are functioning. When FPSU is functioning, it means farmers are provided quality production, and technical services and infrastructure support are provided to them. When Agri-hub operates where the Agro-value chain and markets are functioning to provide services to farmers and when Rural Urban Market Centres are promoting trade for both local/domestic and export markets, then, there is a flow of information between market and producers (DRDLR, 2015).

1.10 Outline of the Dissertation

This study is organised into four chapters. Chapter one outlines the introduction, which gives a brief background of the study, problem statement, aim and objectives guiding the study and motivation for undertaking the study. Chapter two entails the literature review, conceptual framework and theoretical review of issues and factors relating to the study. Chapter three outlines the research methodology employed in the study, including a brief description of the study area, data collection methods and analytical techniques used in data analysis. Chapter four focuses on describing the findings on socio-economic factors of smallholder farmers towards Agri-Park participation (descriptive outcomes), empirical results and thematic analysis outcomes. Lastly,

chapter five contains the summary and conclusion of the major empirical findings, and policy recommendations, together with recommendations for future research and limitations of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature that is relevant to Agri-Park Model mandates on transforming the rural economy and how the model is improving the access to the market by rural smallholder farmers. The key government strategies supporting the development of Agri-Parks, markets, commodity value chain development and expansion of the Agri-Park were discussed in this chapter. Lastly, this chapter discussed constraints faced by rural farmers towards participation in farming and conceptual and theoretical frameworks.

2.2 An overview of the Agri-Park model in South Africa

The South African Government has intervened with various anti-poverty programmes, but the impact has been lower than expected (DRDLR, 2015). Therefore, the crucial problem has not been the programme mandates, but aspects such as proper implementation, funding, monitoring and evaluation played a role in many failures of government programmes to support basic needs. The failure of most agricultural-supported projects by the government has consequently led to the Agri-Park programme initiative, and the concept was quite new to the framework of South Africa (DRDLR, 2015). The Agri-Park programme forms part of the governments undertaking to review all land reform policies, as articulated in the 2011 Green Paper on Land Reform.

Agri-Parks are designed to support rural enterprises, develop rural agro-industries and hence simplify the successful movement of produce to market outlets. According to (DRDLR, 2015) the support offered to farmers at each Agri-Park includes:

- Farm infrastructures;
- Extension services;
- Production inputs and mechanisation; and
- Capacity building and mentorship.

The specific objectives of the Agri-Park policy are to:

- Increase in smallholder agricultural productivity and new jobs are created in the agricultural sector, leading to a reduction in rural poverty and unemployment (FPSU);
- Promote value chain and agro-processing for new job opportunities in Agri-Park (AH);
- Establish and strengthen partnerships, private investment and market linkages, leading to increased incomes from local, regional and international markets (RUMCS); and
- Improve coordination, governance and knowledge management, leading to an efficient and accountable Agri-Park programme.

Guiding Principles and Approach

According to DRDLR (2015), the Agri-Parks policy is guided by the following principles:

- Flexibility to allow for different district-level characteristics and preferences;
- Inclusivity of all vulnerable groups and other stakeholders, with all legitimate interests/expectations considered in policy/strategy formulation and decision-making;
- Control by black local producers and protection of local ownership over the long-term;
- A bottom-up approach to implementation with self-determination at the farmer level;
- Financial sustainability of the proposed entities within 10 years;
- Government funding is directed at development support but not institutional development;
- Utilisation of existing institutions (and non-duplication of functions at local/district levels);
- Application of the King Code for good corporate governance wherever possible;
- Compliance with the mandate of the Public Finance Management Act No. 1 of 1999 (non-negotiable); and,
- Partnerships with the private sector based on risk-sharing structures.

2.3 The implementation measures of Agri-Parks

The establishment and development of Agri-Parks fall on the joint effort of all three spheres of government but is championed by the DRDLR. The implementation process of the Agri-Park programme requires full, compressive, financial support from various sectors, such as private partnerships and stakeholders' involvement. Furthermore, the process of mobilising the main target group, such as smallholder farmers and the entire communities within the district municipality, is very crucial. Rao (2006) advanced that "international experience discovered that several factors, such as physical and financial aspects, are required during the formation of Agri-Parks in order to ensure their success".

DRDLR (2015) established the required main factors, such as site suitability, size of the FPSU and Agri-hub, agro-industrial development potential, infrastructure development and economic and social aspects towards the sustainability of the Agri-Park. Furthermore, these factors outlined the operations and scope of identified Agri-Parks. According to DRDLR (2015), Agri-Parks are designed based on a few aspects, hence promoting the operationalisation of Agri-Parks in South Africa. The following section captures the approved stages for Agri-Park implementation.

2.3.1 Determining Locality

According to DRDLR (2015), the first phase is concerned with the identification of viable sites, which is determined by the economic level of selected areas in all districts. The establishment of the Agri-hubs and FPSUs entailed:

- Creating and institutionalising project management teams to manage all phases of Agri-Park development and implementation in alignment with the CRDP management system;
- Conducting socio-economic analyses and baseline surveys;
- Conducting a national spatial, commodity, value chain and market analysis to determine target sites through the identification of high-value commodities, growing production areas and available infrastructure;

- Generating site-specific maps containing district-specific narratives and selection criteria for initial identification of sites;
- Further development of evaluation criteria for assessing Agri-Parks proposals;
- Weighing each Agri-Park proposal against these evaluation criteria and other important findings from previous analyses to make final determinations on Agri-Park sites;
- Identifying and resolving land issues with local municipalities, traditional authorities and private landowners; and,
- Signing resolutions for the establishment of Agri-Parks with each District Municipality identified."

According to DRDLR (2015), the procedures for identifying and establishing the suitable location for Agri-Parks are based on the following several factors:

- The use of already identified land purchased by the department (state), which has agricultural potential;
- The need to create equal access to markets for all farmers, with a bias towards emerging farmers and clusters of communities;
- The mapping of the rural economy and clustering of challenges and commodities;
- The mapping against soil capability and agriculture potential and Agri-logistics and requirements within different regions; the identification of gateways and economic potential of towns and linkages for Agri-logistics (roads, railways and ports); and
- The supporting programmes and existing agricultural initiatives; the mapping of active and fallow lands and degraded lands for resuscitation in traditional areas; spatial location of communities and potential for the revitalisation of rural towns; and the availability of water schemes or water resources.

2.3.2 Enhancing Production

The second phase entails the “identification and support of smallholder farmers, state farms and communities in proximity of the identified Agri-Parks” (DRDLR, 2015), which involves:

- Organisation and mobilisation of stakeholders and communities residing in identified site localities through participatory consultation on the Agri-Parks model, site selection and identification of production areas to receive support;
- Capacity-building and support to smallholder farmers and communities through the provision of land, pieces of training, farm infrastructure, extension services, production inputs and mechanisation inputs, all of which should be aligned to priority commodities as set out in the APAP;
- Developing detailed production and capacity-building plans for farms located in the proximity of identified Agri-Park sites;
- Coordinating Agri-Park development with other DRDLR programmes targeted at increasing the pace of land acquisition and redistribution;
- Conducting research and development; and,
- Enabling producer ownership of 70% of the equity in Agri-Parks, with the state and commercial interests holding the remaining 30% minority shares through an appropriate legal instrument.

2.3.3 Agri-Park Infrastructure Development

According to DRDLR (2015), the third phase is more focused on the department-approved business plans, infrastructure assessment and commodity and market requirements, and entails the following:

- Development of infrastructure plans for each Agri-Park and ensuring alignment of plans with key infrastructure programmes, which requires consideration of Agri-Park size; local building codes, health, sanitation issues; vehicle access and parking requirements; plot size and numbers; and, the extent of space needed for common infrastructural facilities;

- Working out logistical details, including those concerning roads, communication networks, energy, bridges, water and transport; and
- Constructing and operationalising the Agri-Parks, including working out logistical details'.

2.3.4 The Agri-Park Commodity Value Chain Development

The Agri-Park programme is directed by commodities suitable for the selected location and the DRDLR-approved business plans aligned to the economic viability of the selected areas. Hence, the following aspects are identified in chapter six of NDP (2012):

- Agri-Parks is focusing more on agricultural commodities that have the most promising growth potential (based on district-specific available resources and demand at the regional, national and international levels (DRDLR, 2015). The large commercial agricultural sector intensive commodities are citrus, sub-tropical fruit and vegetables, which are all labour-intensive industries. Furthermore, non-labour-intensive industries, with important value chain linkages prioritised, comprise poultry, soybeans, animal feed, maize and sunflower. Additionally, another significant commodity selected for small-scale labour-intensive farming sub-sectors consist of macadamias, pecan nuts, rooibos tea, olives, figs, cherries and berries;
- Producers have access to improved infrastructure to carry products through the value chain processes and to markets, as well as sharing critical market information;
- The provision of consistent agricultural extension services allows farmers to be informed of new agricultural technologies, obtain advice on best agricultural practices and obtain assistance with dealing with adverse shocks, such as insect infestation or plant disease;
- The Department establishes preferential procurement mechanisms to promoting the entrance of new producers and other entrepreneurs, as well as supporting existing ones. and
- Off-take agreements are finalised per each identified commodity and Agri-Park.

2.4 The role of private sector (commodity groups) towards Agri-Park implementation in South Africa

In fulfilling its mandate, the Department of Rural Development and Land Reform (DRDLR) coordinates and lead the Agri-Parks Programme. However, rural development is a cross-cutting function. Hence, a complex set of partnerships, with multiple stakeholders, both within and outside government, is required to ensure that the rural development mandate is achieved. Due to these difficulties, the establishment and operationalization of Agri-Parks is a joint initiative of the DRDLR in partnership with the Department of Agriculture, Forestry and Fisheries (DAFF), and in collaboration with district and local municipal spheres of government at all levels.

Additionally, the design, development and operationalization of the Agri-Parks has been driven by key private sector actors including commodity groups, cooperatives, organized agriculture, banking sector and existing markets. Input and support from these private sector stakeholders is not enough to prove essential for strengthening and enhancing the Agri-Park specific commodity value-chains. This multi-stakeholder approachshould be amended and prioriotised to ensure that the needs and interests of the many actors involved are addressed, and that holistic support and inclusive participation bolsters the performance of Agri-Parks (DRDLR,2015).

2.5 Monitoring and Evaluation Process for Agri-Parks

The Agri-Parks programme developed its Performance Results Framework (PRF) based on a logical approach of input, process, outputs, outcomes and impact indicators to ensure ongoing monitoring and evaluation of the strategic outcomes and objectives of this policy (DRDLR, 2015). To ensure proper coordination, a monitoring process is constantly needed within the department body structures (directorates and officials). Hence, different legal entities and other roleplayers are involved to ensure the success of the programme. Furthermore, for monitoring progress, the department structures should regularly evaluate the entire programme implementation milestone, timeframe and progress of the programme (DRDLR, 2015).

2.6 Agri-Park achievement outcomes

The increased smallholder agricultural productivity and new jobs created in the agricultural sector lead to a reduction in rural poverty and unemployment. This shall primarily be accomplished under the umbrella of the park, such as the Farmer Production Support Units (FPSU) zone, which is the main unit for capacity building of rural smallholders and farmer outreach. The FPSU is responsible for primary production, and extension services, including mechanisation (DRDLR, 2015). Farmer Production Support Units are centres (more than one per district) of:

- Agricultural input supply control, in terms of quality, quantity and timeous deployment of inputs;
- Extension support and training, universities, agricultural graduates and Narysec working in a symbiotic relationship to “hold-hands” with farmers over the next 10 years;
- Mechanisation support (tractor driving, ploughing, spraying, harvesting, to mention a few)
- Local logistics support, which could entail the delivery of farming inputs, transportation postharvest and transportation to local markets;
- Primary produce collection, including weighing of produce and stock;
- Sorting of produce for local and other markets;
- Packaging of produce for local markets and local storage; and
- Processing for local markets, for example, smallscale mills.

2.7.1 The Promotion of value chain and agro-processing towards the creation of new job opportunities within the Agri-Parks:

According to DRDLR (2015), supporting value chain and rural agro-processing yield economic growth where farmers can benefit from primary basic needs, hence, it is crucial for the success of the programme. Improvements in agro-processing stimulate income growth and better the condition of the farmers (DRDLR, 2015). Promoting value chains and agro-processing within the Agri-hub (AH)’s mandate is very crucial for promoting market accessibility for farmers. It is the main unit for facilitating and supporting agro-processing, packaging, logistics, equipment hires, innovation and

training. Hence, “Agri-hubs are in central places within a district municipality, preferably places with sufficient physical and social infrastructure” (DRDLR, 2015), as highlighted below

- Storage/warehousing facilities: cold storage, dehydrators, silos and weighing facilities;
- Agri-processing facilities: ginners, mills and abattoirs to mention a few;
- Enterprise development areas that lease space to high-intensity start-up industries that can benefit from the inputs of outputs of the Agri-hub, that is. piggeries, tunnel grow crops and bio-gas production to mention a few;
- Packaging facilities for national and international markets;
- Logistics hubs for collection of goods from the FPSUs;
- Transport service workshops and spare parts for larger maintenance tasks of Agri-hub and FPSU equipment; and
- Agricultural technology demonstration parks to train farmers in the AP catchment area on new technologies in terms of fertilizers, plants and seeds, irrigation, energy use and farm implements.

2.6.2 Establishment of partnership, Private investment and Market linkages

The process to strengthen partnerships, private investment and market linkages lead to increased incomes from local, regional and global markets. This is the concentration of the RUMC. The RUMC has three main purposes (DRDLR, 2015), as shown below:

- Linking and contracting rural, urban and international markets through contracts;
- Acting as a holding facility, releasing produce to urban markets based on seasonal trends; and
- Providing market intelligence and information feedback to the AH and FPSU, using the latest Information and Communication Technologies. RUMC is located on the periphery of large urban areas and these facilities provide:
  - Market intelligence;
  - Assist farmers and processors in managing a nexus of contracts;
  - Large warehousing and cold storage facilities to enable market management;

- Logistic and transport in the collection of produce from FPSUs or Agri-hubs;
- Both FPSUs and Agri-hubs provide inputs to the RUMC; and
- Agri-parks share RUMCs.

2.6.3 Coordination, governance and knowledge management improved, leading to an efficient and accountable Agri-Park Programme:

The success of the Agri-Park programme depends on the extent to which DRDLR can effectively and efficiently coordinate all Agri-Park activities. At the national level, DRDLR is well-placed to coordinate the Agri-Park programme with support at the provincial level (DRDLR, 2015). It is very important for the department's district offices, together with provincial offices, to work jointly to ensure that all the implementation plans are executed in the right way, following the proper channels (SOP).

2.7 Important government strategies supporting the growth of Agri-Parks

2.7.1 The National Development Plan (NDP 2030 Vision)

NDP (2012) interpreted the agriculture sector as important for creating jobs and enhancing productivity and "food security". According to NDP (2012), its vision is to create decent and stable jobs in 2030. NDP emphasises "an inclusive rural economy, "which means that rural areas should have better lives and all people should have the privilege to benefit and be involved in the cycle of "the economic, social and political" life of the country (NDP, 2012). According to DRDLR (2015), people should have access to the most basic needs and services to better their standard of living, as it raises the growth of the economy of the country. DRDLR (2015) emphasised that agriculture supported rural areas, where most people depend on farming, therefore, through agriculture employment, poverty reduction can progressively take place. Furthermore, NDP (2012) stressed the matter of sustainable rural areas, through effective land reform projects support, as a mechanism to ensure that agriculture is delivering its mandates.

The Agri-Parks programme is designed to execute the crucial role of developing rural communities by supporting farmers with an operational Agri-hub and FPSU, that serves as a formal market to sell and produce end-products (DRDLR, 2015). The mandate of the programme is to promote the commodity value chain, where farmers will produce from the farm gate to the market, as it promotes value to the end product and enhance

income for struggling farmers. In addition, the Agri-Park programme should be focused on prioritising production that is most suitable for the selected identified sites.

Chapter 6 of NDP (2012) revealed that the “small-scale labour intensive agriculture, such as macadamia, pecan nut, rooibos tea, olive, fig, cherry and berry industries, have the greatest expansion potential due to the significant market demand for these products”. Therefore, Agri-Parks should expand such commodities, hence increasing the market value chain for most rural farmers. Through government comprehensive support, such as sufficient funding, provision of various production inputs, mechanisations, training and market, this means the Agri-Parks can empower most rural distressed farmers to promote the rural economy (DRDLR, 2015).

2.7.2 Government strategy “New Growth Path in 2010”

The New Growth Path (NGP) policy was released in South Africa in October 2010 (Patel, 2010) “to reduce joblessness, poverty and inequality through the creation of decent jobs”. This is in line with leading the South African path towards the goal to develop a sustainable level of economic growth. The Medium-Term Strategic Framework (MTSF) outlined the activities that Government shall undertake in order to meet the specified target to move the economy forward. According to NGP (2010), the target to create five million jobs by 2020 means that more local employment is created, so the Agri-park programme can then tap in to promote jobs and reduce poverty in rural spaces. Therefore, the agriculture sector must assist in meeting the target through various programmes, including the Agri-Park.

Therefore, the Department of Land Reform and Rural Development, as the bigger umbrella, can play a role in creating jobs, and if more resources are availed, then, the objective of NGP is viewed as “channels to poverty reduction, employment generation and spurring economic growth” can be achieved. According to Hausamann et al. (2008), the main purpose of industrial policy is to speed up the process of structural change towards higher productivity activities. This means that through the Agri-Park programme, productivity and trade can be achieved. DRDLR just needs to channel more capital towards the project’s infrastructure so that the Agri-Park programme can be fully functional.

2.7.3 Government strategy (Agricultural Policy Action Plan)

Agricultural Policy Action Plan (APAP) (2007) is defined as a "programmatic response in achieving structural change, by encouraging the development, growth and increased competitiveness of the South African manufacturing (value added) sector". This means that through the programme of Agri-Park, the development towards agro-processing can play a huge role if the government can increase funds for making all the Agri-hubs operational so that farmers can fully access the entire value chain of manufacturing products, for example, maize is turned into maize meal. Furthermore, this can be achieved through "an equitable, productive, competitive, profitable and sustainable agriculture, forestry and fisheries sector", as it will yield a positive impact (DRDLR, 2015). In addition, APAP (2007) promotes "institutional arrangements and processes towards integrating planning, monitoring and evaluation", hence, it is very significant for DRDLR to work together with other relevant stakeholders, such as DAFF, DARD and LED to mention a few. This partnership will promote transformation, equity, growth, competitiveness and sustainability.

2.7.4 District Development Model (DDM) and Agriculture and Agro-Processing Master Plan toward Agri-Parks

During the presidency budget speech held in 2019 , the identified "pattern of operating in silos" as a challenge which led to "to lack of coherence in planning and implementation and has made monitoring and oversight of government's programme difficult" (Ramaphosa,2019). The consequence has been non-optimal delivery of services and diminished impact on the triple challenges of poverty, inequality and employment. Hence these led to the formulation of District Development Plan (DDM) which focused on "a new integrated district-based approach to addressing service delivery challenges and localised procurement and job creation, that promotes and supports local businesses, and that involves communities" (Ramaphosa,2019).

The Model consists of a process by which joint and collaborative planning commenced at local, district and metropolitan by all three spheres of governance resulting in a single strategically focussed one plan,budget and implementation process for each of the 44 districts and 8 metropolitan geographic spaces in the country (DDM,2019).

The AAMP is one of the seven priority plans identified by President Ramaphosa in the State of Nation Address (SONA) of 2019 as part of key economic sectors essential for the economic reconstruction and recovery during and post the Covid-19 pandemic. A Master Plan is considered to be a planning and implementation framework that promotes public-private partnerships to leverage on resources, skills and experiences to advance economic growth and inclusion as well as the creation of sustainable jobs in the country. In addition to developing the AAMP, the Minister of DALRRD also tasked the NAMC to monitor and evaluate the implementation of AAMP by the different social partners (AAMP;2019). Furthermore, the NAMC was considered a strategic state-owned entity to rebuild state capacity (i.e., DALRRD) through collecting and processing market and industry data to improve the credibility of agricultural statistics, rebuild capacity in economic decision tools and policy analysis.Futhermore these implementation should contriute more positive impact towards gri-Park fully functionality of all the componets such as FPSU ,rural urban makert centre and Agri-hub.

According to AAMP(2022) the following are the objectives aligned to Agri-Parks;

- Promote transformation in agriculture and agro-processing sectors;
- Increase food security in South Africa;
- Accelerate the opening of markets and better access conditions;
- Enhance competitiveness and entrepreneurial opportunities through technological innovations, infrastructure development and digitalization;
- Create effective farmer support, agro-processing, food wholesale and retail incentives;
- Create decent and inclusive employment, and improve working conditions and decent pay in the sector including in the face of climate change and technology innovations;
- Increase farming community safety and reduce stock theft;
- Create a capable state and enabling policy environment; and
- Enhance resilience to climate change and management of natural resources

2.7.5 The African Development Bank towards Agri-Park support

The COVID-19 crisis has clearly demonstrated the vulnerability of the livelihoods of many South Africans, and highlighted food insecurity as a key risk. Many now reason that reducing the vulnerability of the livelihoods of the poor, and associated food insecurity, must become a key focus of policy. Investment in agriculture is widely recognized as an imperative to achieving goals related to improvement of food security, creating jobs, creating wealth, and thereby reducing poverty (Ramaphosa,2020). To this end the Government of South Africa is developing the Agro-Industrial Processing Zone Master Plan (AAMP) to guide its activities in the sector and to create employment, increase exports and contribute to rural development. An integral part of this plan is the South Africa Agri Park Program (SA-APP) expected to play an important role in post COVID-19 recovery by prioritizing economic infrastructure connected to industrialization and using the Special Agro Industrial Processing Zone (SAPZ) model of the AfDB to increase value addition, improve regional and national value chains, enhance trade and create more jobs especially for the youth.

The SA-APP model is in direct alignment with the African Development Bank's (AfDB) program of developing Special Agro Processing Zones (SAPZ) in Africa. The Bank in collaboration with the Department of Agriculture, Land Reforms and Rural Development (DALRRD) has prioritized nine of the 44 Agri-parks for development. To achieve this the Bank engaged the services of Mahindra Consulting Engineers Limited (MACE), India to advice on the prioritization of the Agri-parks in line with the objectives of SA-APP and provide further recommendations on the operationalization and implementation. The Report was presented to Government Stakeholders including the Minister of the DALRRD. Given available resources under this Grant, the Technical assistance will focus on two of the nine prioritized Agri Parks namely Tsiame Agri-park located in the Free State Province and Springbokpan Agri-park, located in the North West Province. Both Parks were given a triple "A" rating based on a Multiple Criteria Assessment in the Prioritization Study by MACE (DALRRD,2022). The total projected direct and indirect employment that can be generated by the two Agri Parks at full operation is 13 million jobs (DALRRD,2022).

The project objectives: AfDB grant is to engage a transactions advisor that provide technical assistance and an implementation management structure for the SA-APP. In addition, to provide technical assistance to enable project preparation, packaging, and a phased infrastructure development for two of the South Africa Agri Parks.

There are various Agri-Parks that have successful stories,such as The Makgolokweng Farmer Production Support Unit (FPSU) of the Thabo Mofutsanyane district in Free State province and was strategically implemented not far from the Special Economic Zones (SEZs) of the district. This FPSU is already in utilisation and fully operational. To date, it has advanced mechanisation that supports the local farmers in the district, and it is run by a well-established secondary co-operative that serviced many affliated primary cooperatives. The same FPSU has already procured farm production inputs to support the local farmers. Their main crop produced are soybeans, maize and wheat, hence mechanisation is core to assist them to produce more. Through Agri-Park support most farmers are benefiting with various trainings (capacity-building of farmers) e.g. farmers are trained on financial management, marketing and production system.There is no doubt that FPSUs are becoming a fundamental pillar to the success of rural farmers in the agricultural sector. More support for these FPSUs will be positive for smallholder development.

2.8 Review of other international studies

Some studies completed on Agri-Parks/Agro-based clusters (Nogales, 2010), have specified that Agri-Parks has a positive relationship with the development of rural communities if it is implemented in the right procedure. Therefore, if Agri-Parks are properly planned, and implemented with all the required resources, mainly capital and coordination, they can yield positive results where farmers can benefit. Agro-based clusters, compared to the Agri-Parks being established in South Africa, have been initiated and implemented around the world in different subsectors, including in at least twenty four developing countries. In South America, agro-based clusters are found within several agro-industrial activities in subsectors, such as wine, fruits, fish, cut-flowers and coffee in Brazil, Chile, Bolivia, Argentina, Ecuador, Columbia and Nicaragua (Nogales, 2010). Agro-based clusters have been reported as central in addressing socio-economic challenges in several Asian countries, including India, Vietnam and the

Philippines (DRDLR, 2015). According to Nogales (2010), Agro-based clusters are regarded as “sources of employment and income generation’’ because of the advantage that all the resources and services are located at a site identified for the park. In addition, they attract investments, particularly within the rural economy where the goods and services arrive at the park and all the value chain is operating from raw materials to finished products.

International experience demonstrates that some of the key factors required for establishing agro-based clusters that boost agricultural development, job creation and incomes are: investment in rural infrastructure, which reduces poverty and increases output and profit; basic service provision to participating farmers and extension support, which increases agricultural production. Therefore, the government must invest in the agricultural sector to boost rural development. Food and Agriculture Organisation (2010) indicated that low transport costs, adequate storage and warehousing, which are important for avoiding loss of crops, support to producers to meet food safety requirements and collective action and bargaining, are crucial for promoting the businesses within the park. They promote a cooperative culture and stimulate the market.

Burger et al., (2001) shared the “success of Indonesian small firms in competing, even under the increasing competition, encouraged by globalisation and liberalised markets through clustering and small firms’ subcontracting with larger urban and export firms in buyer-driven market channels”. This means that Agri-Parks can promote competition through component rural urban market centres. Thus, the government should increase capital and finalise the implementation of RUMC so that farmers can have formal contacts for trade information of imports and exports. Nogales (2010) attested that cluster policies are crucial, especially for small-scale farmers and agri-business, as they enable them to engage in higher productivity, more market-oriented and higher value-added production. This means that the Agri-Park programme can be adopted and prioritised more resources, as it has been supported by the policy that engagement of farmers within the programme can yield more harvest towards production and farmers can break even by being involved in the market value chain. DRDLR (2015) supported that central and local governments have discovered that cluster promotion is a valuable tool to support agricultural enterprises in their territory and help them link to global

agricultural value chains more efficiently and sustainably, and this has led Agri-Park to be initiated.

Potter (1998) emphasised that through the clustering strategy, there are the following benefits, such as a “well-developed concentration of related agribusiness spurs increased productivity through specialised inputs, access to information, synergies and access to public goods. Besides, there will be more rapid innovation through cooperative research and new business formation because of competition, which leads to demand for services and the attraction of investors. This dynamism spurs innovation. This means a well-developed Agri-Park can yield more direct and indirect benefits, such as production inputs, mechanisation, and training, thus attracting more investors and increasing the livelihood of people. Rubzen et al., (2013) noted that the clusters model guarantees a productivity improvement, as well as farmer income. The Agri-Park can act as a catalyst to increase productivity and income generated from sales if it is intended to operate all the components that make it a fully functional park. Therefore, the government must invest in rural Agri-Parks as other internationally supported initiatives.

2.9 Review on Economic Sustainability

Rural Development and Land Reform agricultural projects have a mandate in uplifting the livelihoods of rural farmers and the communities. The objective of DRDLR emphasised transforming economic sustainability, through beneficiation from implemented programmes, such as Rural Enterprise and Industrial Development programme, which focuses on small co-operative agri-businesses. Gittinger (1984), Gittinger (1982) and Ntlou (2016) revealed that most agricultural businesses are the cornerstone of creating development towards improving the livelihood and food security in most rural areas. Ntlou (2016) emphasised that sustainability can be examined at the programme and project level, therefore, it is crucial to assess the sustainability of the Agri-Parks. Although the study focuses on the operationalisation or effectiveness of Agri-Parks, and its components, such as FPSU, RUMC and Agri-hub, it is worth paying attention to the aspect of sustainability of models or projects implemented.

Several studies found out that economic analysis of the project assists in discovering unsustainable projects, hence it should be commenced in the initial stages of the project

(Belli et al., (1998); Ntlou, 2016). This means is very important for the government departments to do comprehensive project assessments to check the viability and sustainability aspects of every project to avoid the failure of many government projects implemented. This is in line with the DPME (2013) report, which emphasised that economic sustainability is very crucial when approving the project, as the state resources are utilised and more accountability should be tackled at the beginning of the project in order to promote stipulated goals towards the allocation of scarce resources.

2.10 Constraints faced by smallholder farmers

Khapayi and Celliers (2016) shared that limiting factors faced by emerging farmers that lead to their project distress are “physical infrastructures, such as poor roads, a lack of transportation to the markets from the farms, a lack of marketing skills and information, poor market infrastructure, and high transaction costs, insufficient land availability to expand production, a lack of agricultural implements to better production and poor production and farm management skills”. Therefore, those limiting factors are the major challenges that all farmers are facing in their farming lives.

DAFF (2012) defined smallholder farmers as an important roleplayer that has a positive impact on the livelihoods of many rural poor. In addition, smallholder farmers provide many people with food to eat and thus lead to try to meet some of their basic needs, even though many factors hinder them to produce more. DAFF (2012) attested that many farmers have left the farming system due to low productivity during harvest seasons because they do not yield sufficient income, which means most farmers struggle to an extent where they give up and find alternative jobs that can give better benefits to support their families. On a framework for smallholder development, DAFF (2012) suggested that it is very important to support farmers in order to enhance production, which leads to food security. Therefore, the government can invest in the operationalisation of Agri-Parks, and a farmer production support unit that will serve as the centre of the agro-base cluster and rural urban market centre that will serve as markets.

DAFF (2012) and Ramanyimi (2019) claimed that South African smallholder farmers are struggling with many issues that hinder their state of livelihood, thus restricting them to shift from being subsistence to commercial farmers. This is in line with the study by Fan

(2020), who confirmed that smallholder farmers are a key to ending hunger and malnutrition worldwide, but they are increasingly facing barriers to profitability. This means that most farmers are operating at a loss in most of their businesses due to many limitations, such as a lack of land availability and ownership, poor farm implements and structures, poor mechanisations and a lack of a formal market.

2.10.1 Lack of market access in rural areas

Market access is a vital factor for the majority of black farmers to enhance their productivity and development because most farmers are operating at a loss, with no income or profit to empower their growth. According to DAFF (2012), Chipfupa (2017) and Timmer (2017), farmers and markets are linked but due to being remotely located in deep rural areas, most formal market information is still a barrier, wherein it leads to most farmers not engaged to contracts for formal market and thus results in low-income generation. In addition, the accessibility to formal markets by most farmers plays a huge role in leading farmers not generating income because all farmers' goals are to produce and reach the market to have an income. Khapayi and Celliers (2016) suggested that the government has a crucial role to play in increasing market participation of emerging farmers through encouraging group marketing, upgrading roads to enable smooth accessibility of farmers to output markets and the establishment of local point sales in farming rural areas.

Furthermore, many rural farmers are selling their produce to local markets, such as hawkers, and farm gates, which have a low-income return (DAFF, 2012). This is also an important factor towards the operationalisation of Agri-Parks and rural urban market centres in the agriculture sector, especially in rural areas. A study conducted by Magesa et al. (2014) highlighted that finding a proper market is an issue, various sectors need to intervene to assist rural farmers. This can be achieved if Agri-Parks can operate all its components so that market can be accessed in form of collective bargaining power because the secondary cooperative will be an umbrella to service all primary cooperatives and private entities. Furthermore, Khapayi and Celliers (2016) emphasised an inability to interpret market information to be used in production planning and marketing so that most farmers will have information about market access.

2.10.2 Transportation problem

Most smallholder farmers are struggling to have the ownership of acquiring transport to collect their produce to markets, which thus results in the depreciation of the quality of produce, such as perishable commodities. Khapayi and Celliers (2016) discovered that limiting factors affecting farmers are physical infrastructure, such as poor roads, and lack of transportation to the markets from the farms, hence selling their produce to hawkers, and farm gates as their local markets. Access to credit is one of the obstacles that make farmers not to purchase tractors which are beyond their financial means. Due to low income, commercial banks decline their approval of loans and thus resulting in poor transportation and draught modes. This is in line with the study of Sifundza (2019) and Maziya (2019) who concluded that farmers are still facing constraints in acquiring formal credit due to a lack of many factors, such as income, which hinder them to procure expensive mechanisation. Hence, this affects the supply of goods to the market because of limited important assets, such as mechanisation and vehicles for the project

2.10.3 Lack of on-farm Infrastructure and high transaction costs

The majority of smallholder farmers lack ownership to acquire quality standard on-farm infrastructure, including storage and cold rooms to preserve their produce in a better state after yield. Mazibuko et al. (2019) revealed that the expansion of infrastructure is very crucial because many obstacles faced by smallholder farmers are the state of gravel roads, which plays a negative impact on market access in urban areas. DAFF (2012) and Khapayi and Celliers (2016) shared that infrastructure, such as abattoirs, storage, processing facilities and trading facilities contribute as a barrier to smallholder farmers' market participation. Poole (2017) emphasised that for improvement, the availability of financial services can reduce market transaction costs, therefore, that is very important for Agri-Park to prioritise the operations of FPSU and Agri-hub.

2.10.4 Lack of human capital and technology

The issue of finances and technology are challenges for most rural smallholder farmers. Most rural farmers are uneducated, and this makes it difficult for them to apply new technological techniques and assets, which require more training and practical

demonstrations. This means the Agri-Park benefits, such as access to mechanisation and training, can play a huge role in giving back the chance to most disadvantaged farmers that are still illiterate in that regard. Agri-Park will act as the institution that offers various training to farmers. Baloyi (2010) attested that many smallholder farmers are "not capacitated with financial and marketing skills and are unable to meet the quality standards set by fresh produce markets and food processors". This means for the government to support the Agri-Park interventions by ensuring that all components of the park are fully functioning, this can be an answer to many farmers who are facing a crisis in acquiring most of the basic needs and services, leading to lower productivity and income.

2.10.5 Inconsistency in production results in a lack of market

Most rural farmers cannot enhance the income or profits in their projects due to acquiring a stable market and most of them are not accessing contract agreements such as a letter of intent to make a formal selling as a market.

Baloyi (2010) reported that smallholder farmers are unreliable in producing huge supplies, such as fresh produce markets. Hence, their bargaining power is very low, owing to poor access to market information, and limited access to financial markets, which prevents them from selling their products at the most profitable time. This means that Agri-Park can serve as a solution to a lack of market access. Agri-Hubs, are designed like "fresh produce market", thus can play a role to support many farmers as they will be affiliated with the secondary cooperative for the programme. This means the bargaining power will assist farmers to sell their products and producing more knowing that there is a need to supply more products (market demand). This is in line with DAFF (2012), which recommended that cooperative development is one of the most effective interventions through which growth in smallholder farming could be enhanced, thereby creating long-term food security, job opportunities and income.

2.11 Agri-Park Model Conceptual Framework.

Relationships and inter-linkages among the Agri-Park specific objectives

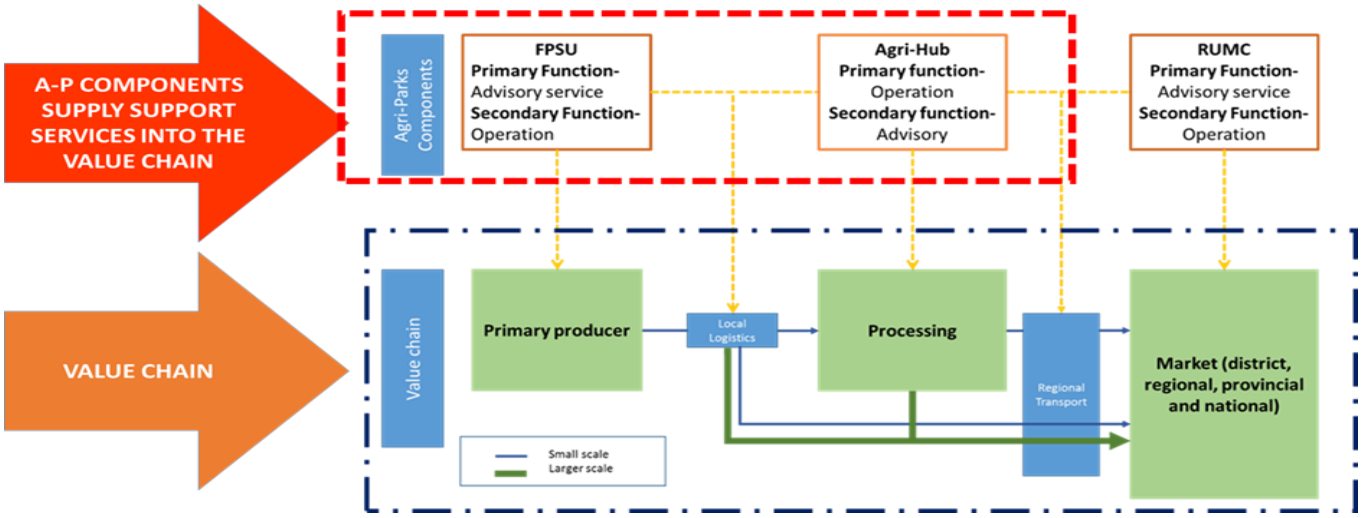

Figure 2.1: Relationships and inter-linkages among the Agri-Park specific objectives
Source: (DRDLR, 2017)

The Agri-Park Impact Pathway

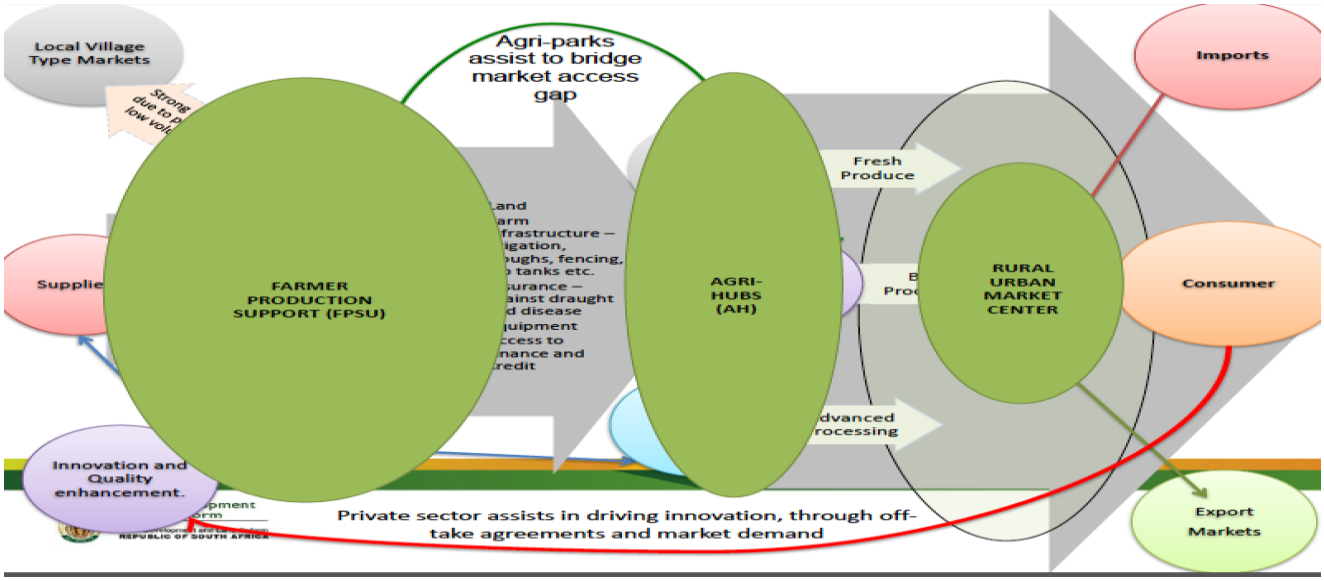

Figure 2.2: Agri-Park Impact Pathway
Source: (DRDLR, 2017)

The Agri-Park (Farmer Production Support Unit), Function

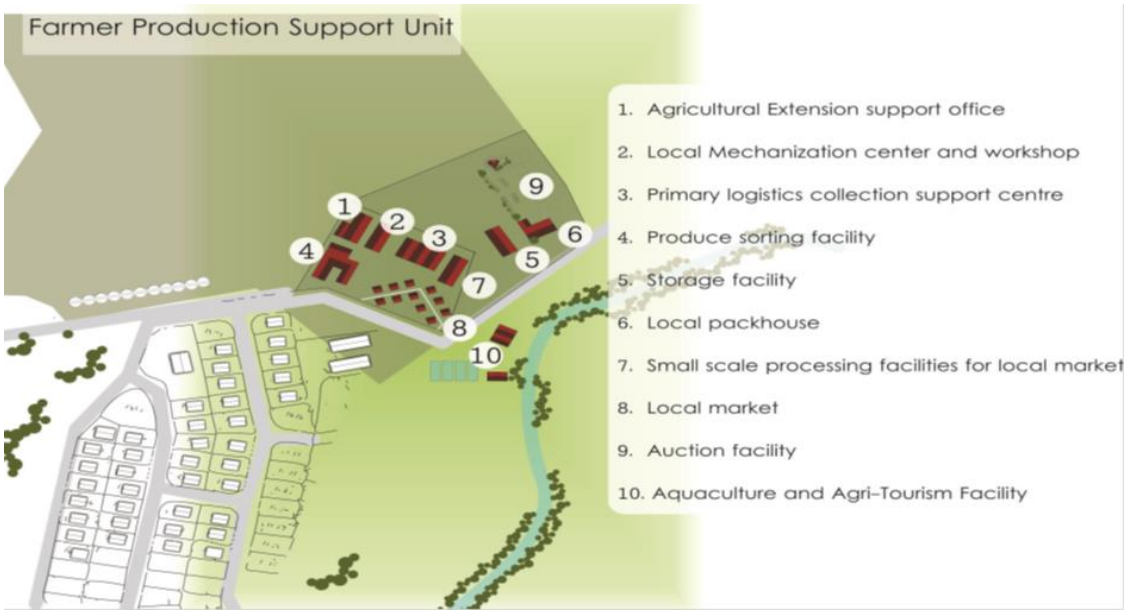

Figure 2.2:Agri-Park (Farmer Production Support Unit) Function
Source: (DRDLR, 2017)

The Agri-Park (Agri-Hub Zone) Function

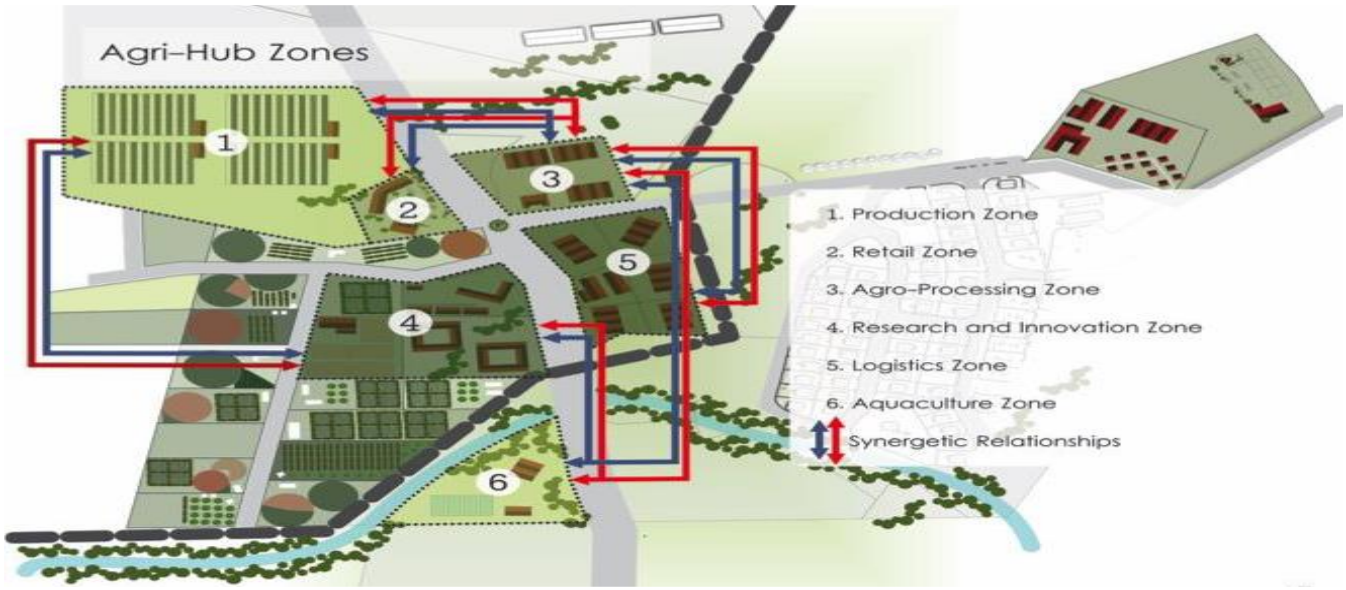

Figure 2.4: Agri-Park (Agri-Hub Zone), Function
Source: (DRDLR, 2017)

The Agri-Park Frameworks: Main Strategic Components/Goals Relationships and inter-linkages among the Agri-Park specifics objectives

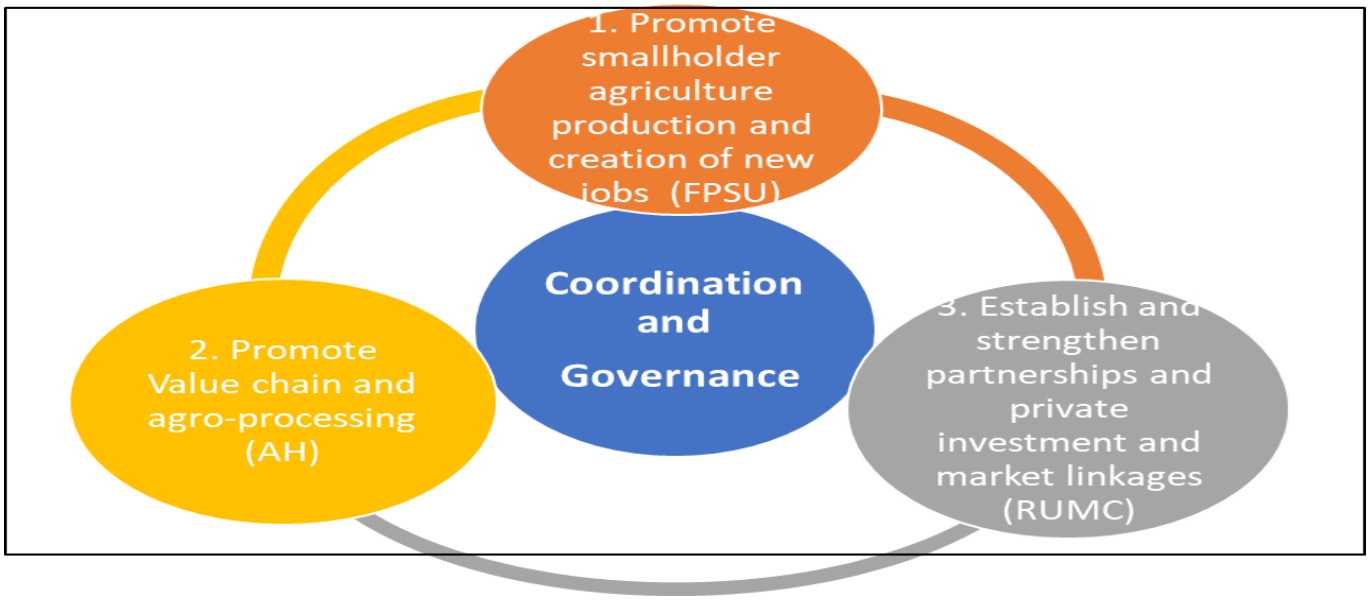

Figure 2.5: Agri-Park Frameworks Main Strategic Components
Source: (DRDLR, 2017)

2.11.1 The conceptual framework of the Agri-Park model: elements of the measurements of the programme effectiveness

The Agri-Park policy "supports the creation of connection of various rural agricultural businesses across South Africa to serve the primary vehicles of rural agricultural transformation and comprehensive rural development" (DRDLR, 2015). Its mandate impact is to create "by 2030, a transformed agrarian sector, improved agricultural productivity and creation of new jobs through an expanded rural economy, agro-processing and reduction of rural unemployment" (NDP, 2012). In addition, the goal of the Agri-Park programme is to set out the main goal of "rural economy transformation development at different levels in South Africa". Therefore, Agri-Parks must provide basic needs and services for all farmers to benefit (Agri-Hub and Famers Production Support Unit).

Nogales (2010) revealed that a "concentration of producers is engaged in the same agricultural and agro-industrial subsector and interconnect to build value networks when addressing common challenges and pursuing common opportunities". Da Silva et al. (2011) claimed that "Agro-industries are important components of the manufacturing

sector, where value is added to agricultural raw materials through the processing and handling operations". Hence the Agri-Park programme is mandated to create more income and more opportunities for farmers to participate in a formal space that can be a market for many struggling farmers. Furthermore, a cluster is regarded as a "valuable tool to agricultural enterprises in their area and help them link to global agricultural value chains more efficiently and sustainably (Nogales, 2010).

According to Sharma and Anupam (2014), "clustering in the agricultural sector is most likely needed to be induced by an external agent, which could be government, large local firms and international investments. However, this means Agri-Parks can assist farmers that cannot do better on their projects, as smallholder farmers still have many challenges with farming needs. They can have an opportunity to benefit through being a member of the secondary cooperative.

The government have already "established Agri-Parks in 44 district municipalities in the country to transform rural economies, improve food security and reduce poverty at the lowest levels (DRDLR, 2015). The government invested funding of R 2 billion for the Agri-Park initiative in the financial year 2015/2016, with the mandate of bringing development and services closer to rural smallholder farmers. In addition, the government must prioritise Agri-Park development because this can assist the development of the farming community and thus will result in the growth of the economy.

According to Vorley et al. (2009), "market modernisation can offer increased economic opportunities for producers, consumers, entrepreneurs and other actors in the food chain. This means Agri-Parks can create a market where all the players can interact with each other, thus within the FPSU and Agri-hubs, the farmers and consumers can play a role in the value chain and will yield benefits to society. Therefore, the government should adopt international experiences of an agro-base cluster, where they can improve more towards the entire implementation process for the programme to be successful.

Sharma and Anupam (2014) concluded that "agro-based clusters need to be induced and fostered through public and private entities, owing to a lack of managerial competence and information among the stakeholders. This means Agri-Parks can prioritise public and private partnerships where the budget can be combined with proper management to avoid more failures of the programme. Hence, the government's

responsibility is to ensure they support by providing all resources, including enough budget to ensure success and sustainability.

Yu et al., (2013) qualified that “building agro-food cluster in less developed regions is more challenging because the sector is dominated by small-scale producers, which are organised more informally, thus lacking the links to research and innovation. This is difficult for the critical mass needed for growth. The government, through the Agri-Park programme, can increase competitiveness by evaluating and improving the progress of the programme. The important aspects, such as environmental and social standards, market research, implementation, and effectiveness of pieces of training, are required for the progress of each Agri-Park and the overall impact of the programme (Rao, 2006).

For building effective Agri-Parks, various factors should be the cornerstone for operationalisation of the programme’s progress. Therefore, the following phase based on the operationalisation of the park is production efficiency, infrastructure development, market and commodity value chain development and locality of the FPSU and Agri-Hubs that are economically viable. As stated by Haggblade et al. (2012), “ongoing dialogue among groups, with a vested interest in value chain performance, becomes a vehicle for recognising shifting opportunities and monitoring ongoing performance of commercially vulnerable groups.

2.12 Theoretical framework

The review of prior research and thought relevant to this study was initially focused on the assessment of the agro-base cluster model, which is similar to the concept of the Agri-Parks model that determines if there is a gap with regards to operationalisation and economic sustainability in the effectiveness of meeting the mandate of Comprehensive Rural Development Programme (CRDP).

2.12.1 Theoretical framework for Agro-Base Cluster Model, (Agri-Parks Model)

According to Nogales (2010), “an agro-based cluster (AC) is simply a concentration of producers, agribusinesses and institutions that are engaged in the same agricultural or agro-industrial subsector, and interconnect and build value networks when addressing common challenges and pursuing common opportunities”. The reviewed literature concurred that cluster development can act as an important tool in the development of agriculture (Alidou, 2010; Nogales, 2010; Toolo; 2015; Sharma and Anupam, 2014; Yu et al., 2013). The idea of ‘cluster’ has been adopted due to the “attention of policymakers

in the last two decades; the worldwide clusters have been considered the potential driver of competitiveness".

Furthermore, clusters are geographic concentrations of interconnected companies and institutions field (Porter field, 1998), and the study showed that clusters can be a combination of related industries and others, such as cooperative entities which play an important role in competition to exist in market places. However, there several factors that make Agri-park be operationalised and economically sustainable. This study will seek to evaluate the Agri-Parks model and how effective it is in bringing sustainability to the government mandate and market accessibility towards smallholder farmers (beneficiaries).

Yu et al. (2013) uncovered certain determinants of the Agri-Parks and for the cluster model, they are efficient policy instruments that allow for the concentration of resources and funding in targeted areas. Another factor uncovered is growth, which appears to have an impact on the growth of rural development. Still, Agri-Parks requires enough funding support and proper managerial competence to be operational for a longer period.

Porter (1998) defined a cluster as "a geographically proximate group of interconnected companies and associate's institutions in a particular field linked by commonalities and complementarities. Porter (1998) used the diamond model of competitive advantage to analyse how the concentration of the new economy competes. Potter (1998) noted that the activities in the cluster industries can result in new and better ways to compete and to bring innovation faster to the market. This study seeks to assess how the Agri-Park model, as new strategy inception from 2015 to 2021, is driving the competitiveness within the agricultural growth or economy and cooperation in benefiting smallholders towards the operationalisation of farmer production support units and rural urban market centres in South Africa.

Rubzen et al. (2013) shared the benefits of clusters as an improvement in productivity as well as farmers' income. The same study also uncovered that a well-developed concentration of related agribusiness spurs increased productivity through specialised inputs, access to information and market cooperation. This means the government should continue to support the Agri-Park so that farmers can increase their income by participating and benefiting from the programme.

Yu et al., (2013) report that there is still a need to support financially the projects for the sustainability of Agri-Parks or Agro-base clusters. This study will focus on factors such as financial or investment from the government in supporting agricultural projects. Nogles (2010) discovered that promoting an Agro-based cluster in developing countries is a complex procedure due to weak linkages that exist among actors. Therefore, the study needs to consider an existing “Agri-Parks” programme in South Africa and then seek to study and assess the programme implementation approaches and try support those ties.

2.13 Chapter summary

The chapter overviewed the history behind the initiative of the Agri-Park programme, where the literature propounds that the South African Government has intervened with various anti-poverty programmes, but the impact has been less than predictable. The chapter illustrated that the key issue though has not been the mandates of the programme, but rather the coordination of the programme events and integrated package services to support basic needs. Furthermore, the lack of planning, monitoring, and poor implementation have thus led to the Agri-Park initiatives. The chapter has highlighted the intervention made by the government towards the Agri-Park programme in South Africa. The chapter covered the implementation measures of Agri-Parks, which are established for the development of Agri-Parks by all joint efforts of three spheres of government but championed via the DRDLR.

This chapter also discussed the Agri-Park Model mandates on transforming the rural economy and how the model is improving the market outreach by rural smallholder farmers. The key government strategies supporting the development of Agri-Parks, markets, commodity value chain development and expansion of the Agri-Park were discussed in this chapter. International experiences have revealed that several physical and financial factors need to be considered in the process of operationalising Agri-Parks to ensure their achievements and boost agricultural development. The creation and operationalisation of Agri-Parks in South Africa stages, such as determining locality, enhancing production, Agri-Park infrastructure development, markets and commodity value chain development and expansion, were discussed. The National Development Plan towards agriculture was reviewed as it is critical for employment and food security

and the New Growth Path in 2010, which is based on decreasing unemployment, poverty and inequality through the creation of decent jobs. The Agro-based clusters model, similar to Agri-Park, was discussed as it serves as a source of employment, and income generation and produces opportunities to participate within the FPSU and Agri-Hub. Lastly, this chapter discussed constraints faced by rural farmers towards participation in farming, which include poor access to the market in rural areas, transportation, a lack of proper infrastructure, high transaction costs, low production, and poor capital and technology. Furthermore, the conceptual and theoretical framework was outlined.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This section provides a brief description of the study area, research paradigm, research approach, research design, population and sample and sampling techniques. It also captures the data collection instrument, data analysis, reliability and validity. All this was in relation to the objectives outlined and ethical considerations of the study.

3.2 Research paradigm

The word *paradigm* is used to refer to the philosophical assumptions or to the basic set of beliefs that guide the actions and define the worldview of the researcher (Lincoln et al., 2011). According to TerreBlanche and Durrheim (1999), a research paradigm is an all-encompassing system of interrelated practice and thinking that defines the nature of enquiry along three dimensions. The term *paradigm* originated from the Greek word *paradeigma*, which means pattern and was first used by Thomas Kuhn (1962) to mean a conceptual framework shared by a community of scientists, which provided them with a convenient model for examining problems and finding solutions. According to Kuhn (1962), the term paradigm refers to a research culture with a set of beliefs, values and assumptions that a community of researchers has in common regarding the nature and conduct of research.

According to Blanche et al. (2006), positivistic thinkers adopt scientific methods and arrange the knowledge generation process with the help of quantification to enhance accuracy in the description of parameters and the relationship among them. Positivism is based on uncovering truth and presenting it by empirical means (Henning, Van Rensburg & Smit, 2004. Therefore, this study used the mixed method approach, which is both qualitative and quantitative, which are positivistic and interpretivist paradigms.

3.3 Research approach

The research adopted a pragmatic approach, which is referred to as a mixed approach. According to Creswell (2003), a mixed approach is one of the methods which allows researchers to base knowledge and claims on pragmatic grounds, which promotes the

freedom to use both research methods (qualitative and quantitative) simultaneously. The study used mixed research methods, such as qualitative and quantitative approaches to provide a plan of action that gives direction to conduct the research systematically and in an effective way to produce results.

3.4 Research design

The study applied a mixed methods approach, which is both a qualitative and quantitative research design. The mixed methods were applied to ensure a better understanding of options and motivations, as compared to using either qualitative or qualitative only. The qualitative data of this study consists of examining, categorising, tabulating and recombining shreds of evidence on the implementation approach, and standard operating procedures of Agri-Parks. The qualitative data were grouped into meaningful patterns and themes to summarise and organise the data into meaning.

The quantitative data were used to answer the objective, such as the socio-economic factors of smallholder farmers towards participating in the Agri-Parks programme. Data were analysed using descriptive statistics. Quantitative data were used to quantify the problem by a way of generating numerical data into usable statistics. According to Homer (2008), mixed methods can be an ideal technique to assess complex interventions. This study adopts both methods. According to Creswell (2009), when the results of a qualitative study are combined with quantitative techniques, it helps to interpret and better understand the complex reality of any given situation, along with the implications of quantitative data.

3.5 Study area

The study was conducted in the North West Province, South Africa. North West province is part of the nine provinces of South Africa. The study focused on three districts municipalities, Dr Ruth Segomotsi Mompati District, Ngaka Modiri Molema District and Bojanala Platinum District Municipalities in the North West Province of South Africa. The province has 18 local municipalities. According to Stats SA (2022), the population is estimated to be 3 978 955 and it covers an area of about 104 882 km² square kilometres.

The Dr Ruth Segomotsi Mompati district municipality compromises five local municipalities: Naledi, Greater Taung, Kagisano Molopo, Mamusa and Lekwa-Teemane. Other towns include Amalia, Bloemhof, Christiana, Piet Plessis, Pomfret, Pudimoe, Reivilo, Schweizer-Reneke, Stella, Taung and Vryburg, with 470 villages (COGTA,2020). The towns are dispersed within a 250km radius. It is the largest district in the province, making up almost half of its geographical area. According to COGTA (2020), the Ngaka Modiri Molema district has five local districts notably Mahikeng, Ratlou, Tswaing, Ditsobotla and Ramotshere. The main economic activity across the district is agriculture, which includes both crops (maize) and livestock. Besides, Bojanala Platinum district has five local municipalities namely Moretele, Madibeng, Rustenburg, Kgetlengrivier and Moses Kotane. The main economy anchors on mining and agricultural activities dominating are (mix-crop farming and livestock).

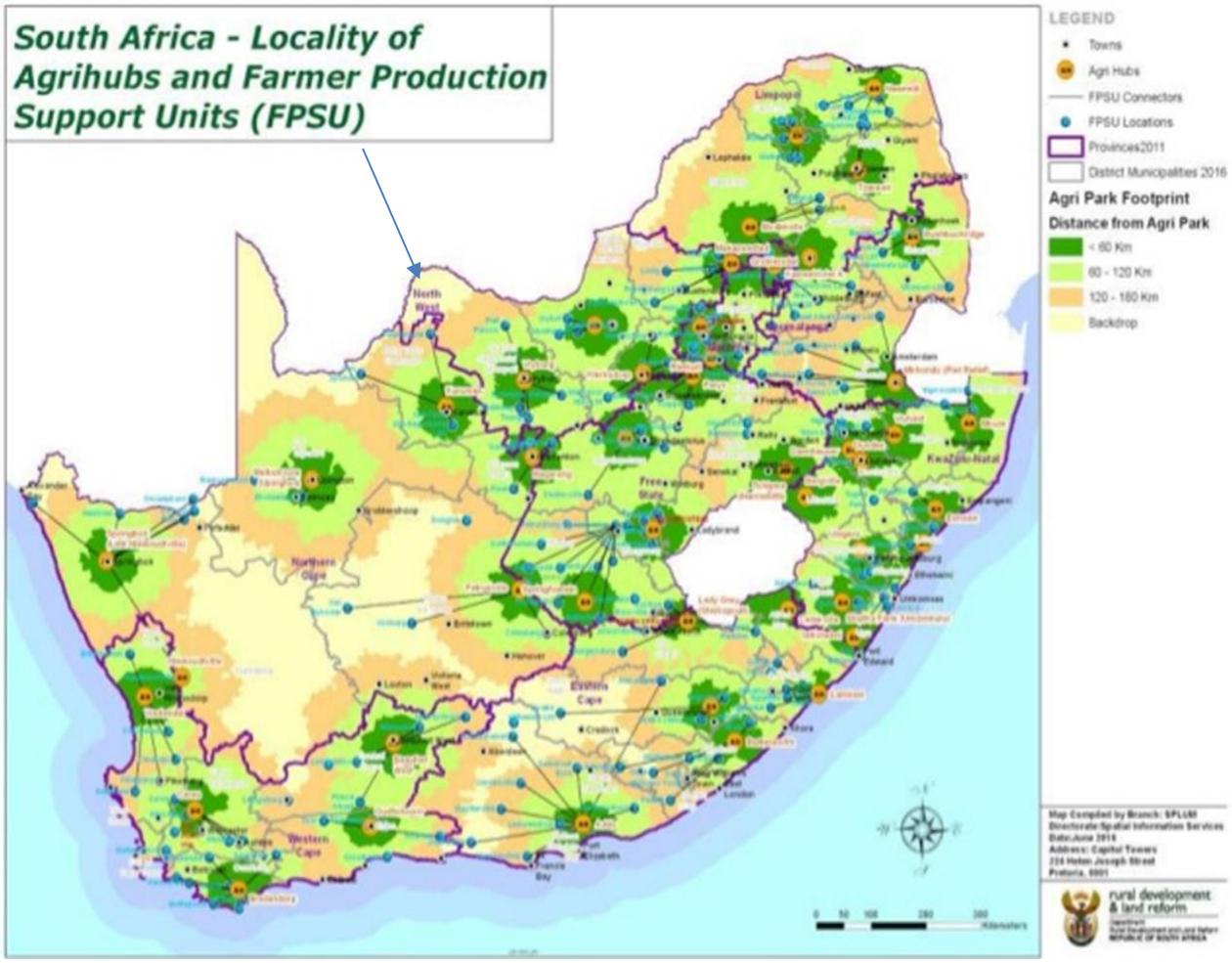

Figure 3.1: Map of Agri-Park in South Africa

Source: DRDLR, 2016.

The targeted areas in the study are:

In Dr Ruth Segomotsi Mompati District, the Agri-Park is in the Taung area and is called Taung Farmers' Production Support Unit, under Greater Taung Municipality, North West Province. According to COGTA (2022), several agricultural value chains exist to a greater or lesser extent in all of the district's five local municipalities. Whereas red meat (beef) and poultry are the most recognised in the district, other value chains exist to a lesser extent namely wheat, sunflower seeds, groundnuts, maize and goat meat value chains (COGTA,2022). The most dominant commodity is beef and crop (Maize,lucerne and barley) production (DAFF, 2022)

In Ngaka Modiri Molema district, the Agri-Park components are called Springbokpan Agri-Hub and the Farmers' Production Support Unit centre is Mooifontein FPSU in the North West Province. The most dominant commodities are maize and beef production. In Bojanala Platinum district, the Agri-Park is in the Makweleng area and there are two Farmers' Production Support Units, such as Makweleng FPSU and Jericho FPSU. The most dominatating commodities are beef and maize production.

The District participation

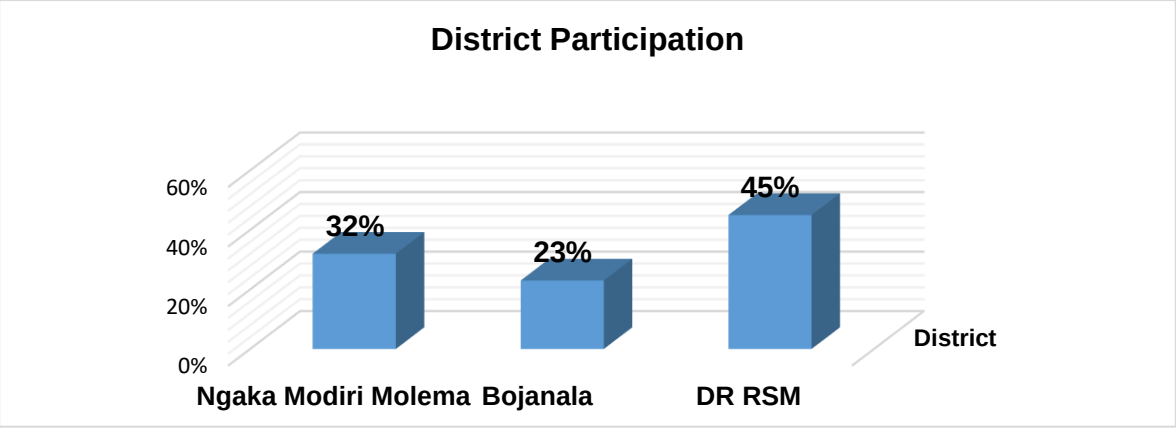

Figure 3.2 District participation

Source: Results from SPSS (Version 27), generated from Survey, 2021

Figure: 3.2 above illustrates the selected districts in the province, such as Ngaka Modiri Molema, Bojanala Platinum and Dr Ruth Segomotsi Mompati. The outcomes depict that most sample farmers were from the DR RSM district, with 45%. The second district

sampled farmers were from Ngaka Modiri Molema, with 32% and lastly, 23% was constituted from Bojanala Platinum district in the North West Province.

3.6. Sample and sampling techniques

3.6.1 Sampling population

The study used stratified random sampling to select farmers in the study area. The smallholder farmers involved in the study were stratified into two strata: Agri-Park participants/beneficiaries and non-participants. From the stratum group, random sampling was employed to obtain 64 Agri-Park participants and 64 non-participants .

The total sample was 128 smallholder farmers selected from a population of 903. The sampling process was based on smallholder farmers that are producing different commodities (crops) and farming with livestock. Agri-Park participants are smallholder farmers affiliated with a secondary co-operative that has benefited from the programme.

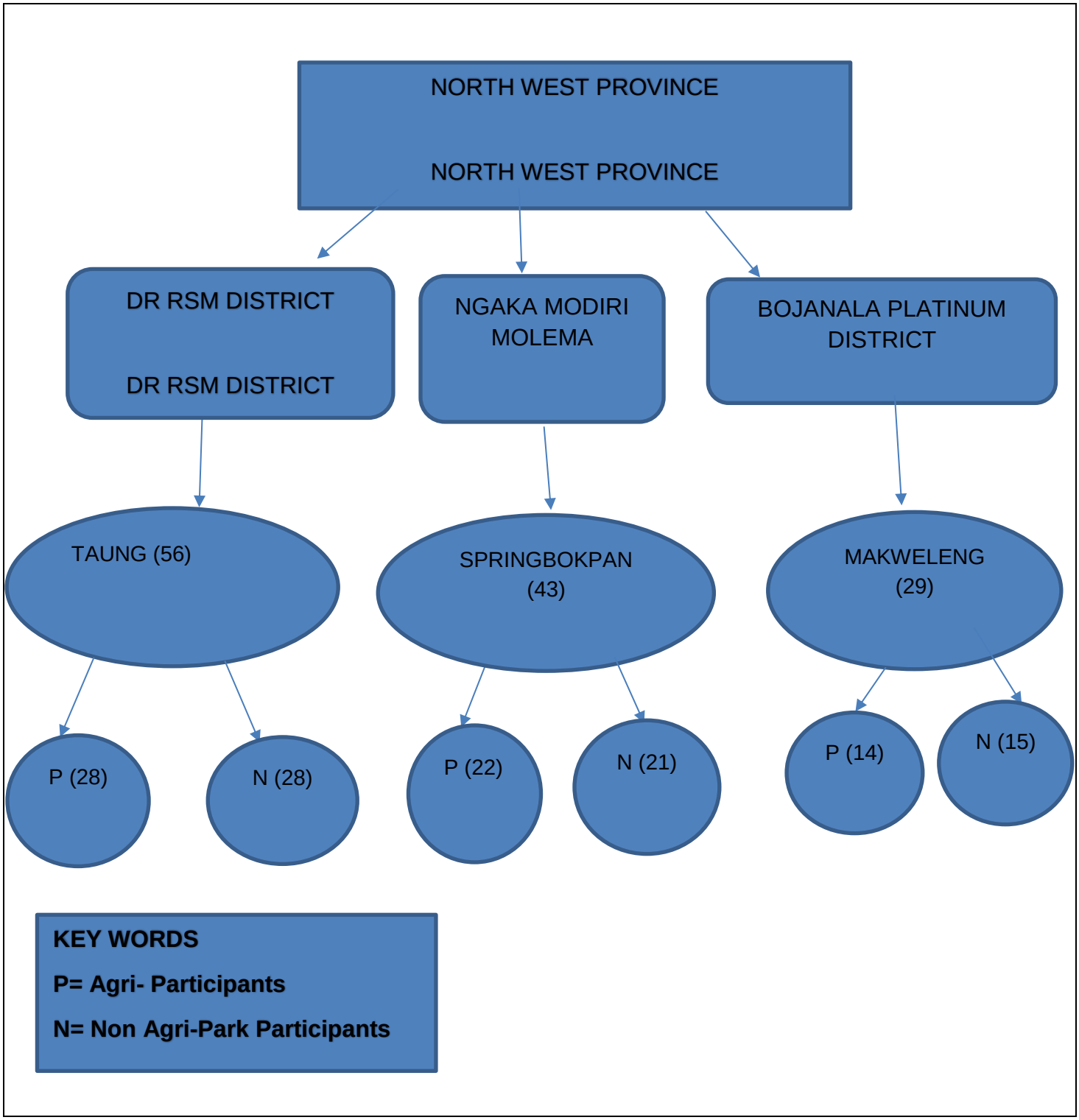

Figure 3.3: The Stratified Random Sampling Method/Formula (The total sample of the study number of sample N= 128 (smallholder farmers)

Source: Author

Table 3.1: Respondents: DRDLR Officials target

Director: Rural Infrastructure & Development (RID) unit	N= 1
Officials: project coordinators; Rural Infrastructure & Development (RID)	N= 2
Director: Rural Enterprise & Industrial Development (REID) unit	N=1
Duty Director Rural Enterprise & Industrial Development (REID) unit	N=3
Senior & Coordinator's Project officer	N= 8
Total	**N=15**

Source: Author

3.6.2 Sampling techniques

The study used stratified and purposive sampling methods to select Agri-Parks projects and respondents (farmers and officials). The research's specific targets are derived from the respondents/smallholder farmers who have benefited from the support of the Rural Enterprise and Industrial Development unit, within the DRDLR since its inception in 2015-2021. Stratified sampling was conducted to divide the population into smaller sub-groups (strata); the two groups are participants and non-participants in the Agri-Park programme. The division was to form members that shared the same characteristics or attributes, such as crop and livestock farming. The distribution of the population into similar groups often reduces the sampling error and increases accuracy.

The purposive sampling was applied to select experts within an organisation, which are members (managers and officials) that are in the Department of Rural Development & Land Reform database. Primary data were collected from REID Unit beneficiaries and non-participant farmers engaged in farming with several types of agricultural commodities. Furthermore, the primary data were gathered via interviews and observation with department officials and smallholder farmers.

Respondents were smallholder farmers with a total sample number of 128 and officials were 15 in total. Hence, they were divided into different categories, based on their roles, tasks and responsibilities, such as:

a) Provincial Government officials: A questionnaire was administered to the project managers, such as Director, and Deputy Directors responsible for Agri-Park mandates from the Unit Rural Enterprises, Industrial Development (REID) and Rural Infrastructure Development (RID) within DRDLR.
b) Senior Project Officer and Project Coordinators: DRDLR officials responsible for REID unit (Agri-Parks) facilitation and coordination were interviewed using questionnaires.
c) Beneficiaries/Smallholder farmers: A structured questionnaire was used for smallholder farmers who are affiliated under the umbrella of secondary co-operatives, per district. This only targeted farmers producing various commodities, such as livestock and mixed crop farming.
d) Focus group (Project Executives and Beneficiaries): A checklist was used for both executive members of secondary cooperatives (chairperson, secretary, treasurer and deputy chairperson) and additional members of various primary cooperatives that affiliated under the umbrella of the secondary cooperative.

3.7 Data collection instrument

The study used both primary and secondary data obtained from the implementation and evaluation of the Agri-Park programme (from its inception in 2015 to 2021). Also, both quantitative (numeric) and qualitative (text) information was gathered. Primary data were collected through a field survey, using a structured questionnaire, which was administered through face-to-face and telephonic interviews with the respondents (farmers & DRDLR officials), as the main beneficiaries and roleplayers relevant to the Agri-Park programme within DRDLR. Due to the Covid-19 pandemic, for participants that were not comfortable with face-to-face interaction, the arrangement to conduct the interview was done via telephonic interview. Participants with internet access were sent a questionnaire via email to adhere to Covid-19 regulations. The questionnaires included a mixture of open and close-ended questions. The questionnaire was designed to collect the following data: social and economic characteristics of the smallholder farmers, challenges faced by

farmers on access to markets and challenges faced in the implementation process of Agri-Parks. Qualitative data were collected via interviews, while observation was used to assess the implementation approach of the programme interventions. The secondary data were obtained from the DRDLR database. The DRDLR, as the main initiator of the programme, its archives, and past publication about the Agri-Park model served as secondary data. These publications included:

- The Government Gazzette/Database,
- Various Government reports, and
- The founding documents of the Agri-Park model.

The government database and the Agri-park Master plan (policies) dataset were available and assisted in providing insight into the study and reviewing documentation provided data about the following: number of years which the Agri-Park has been operating, the recorded amount of funding invested in the FPSU, Agri-hub, Market Centre infrastructures, targets of farmers' participation, stakeholders' involvement and operations.

3.8 Data Analysis

The data obtained from questionnaire were captured and analysed using Statistical Package for Social Science software SPSS 27.0 Version, to run regression models and Stata computer Software Version 15. In this study, statistics and inferential statistics were used for data analysis.

3.8.1 To assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in North West province, qualitative analysis was used (Exploratory strategy).

The study sought to assess the implementation approach of Agri-Park's programme interventions (FPSU & Agri-Hub) as significant in the study area. The exploratory research approach was employed to investigate and assess a better implementation process and issues of Agri-Parks intervention. The study assessed if the Farmer Production Support Unit (FPSU) and Agri-hubs are implemented and aligned according to the department-approved business plan, and standard operating procedures (SOP), as they guide the implementation process. Furthermore, the documents available assisted to find out the

impact of the programme in the study area. This means that Agri-Park documents, interview transcripts and questionnaire serve as types of data used in the study.

3.8.2 Thematic Analysis Process

To assess the implementation approach of Agri-Park programme interventions (FPSU & Agri-Hub) in the North West province, qualitative analysis (Thematic approach) was used. The study used thematic analysis described by Braun and Clarke (2006) as a method for identifying, analysing and reporting patterns (themes) within data. According to Guest et al. (2012), thematic analysis is a qualitative method for generating codes from raw data. This means the researcher should read and re-read the data to find specific themes that are deemed critical to answering the research questions. The analytic process for this study was driven by Braun and Clarke (2006) who illustrated the use of six phases of thematic analysis to identify and describe patterns or themes within the data as shown in Figure 3.4.

The interviewing of DRDLR experts or implementers in different Units (REID & RID) in the districts as secondary sources was defined and explained using thematic analysis. The thematic analysis was used to interpret qualitative data into quantitative data. Then, once the data was recorded, it was revised repeatedly to classify shared themes, such as patterns, topics and ideas in the meaning conveyed by language. The themes identified were re-analysed so that they became more refined, relevant and given short-hand codes.

Braun and Clarke (2006) and Chand (2021) emphasised that the researcher can then interpret the transcript with the codes that have been identified. Therefore, the themes identified were used to support or challenge existing theories, with specific examples of data or quotes being used as supporting evidence. The study considered several methods in conducting thematic analysis, but the most common form follows a “six-step process”:

- Familiarisation,
- Coding,
- Generating themes,
- Reviewing themes,
- Defining and naming themes, and
- Writing up.

Thematic Analysis steps

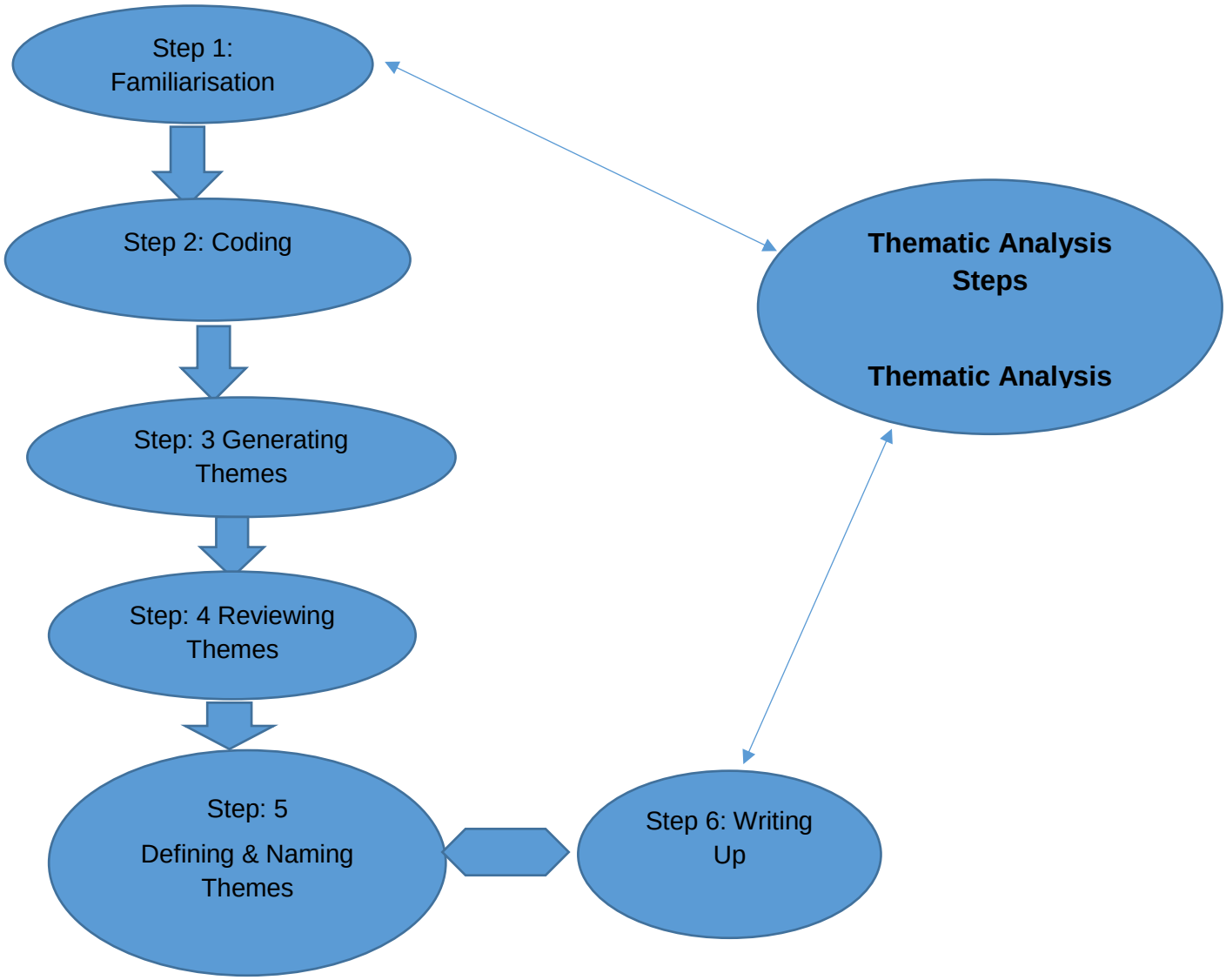

Figure 3.4: Thematic Analysis Steps 2

Phases of Thematic Analysis (Adopted from Braun & Clarke, 2006)

Figure 3.4 above demonstrated the cycle of the thematic process where the first step was to familiarise myself with the data sampled that was retrieved from 128 smallholder farmers' questionnaires. The process of transcribing the data meant reading and re-reading and then noting the initial ideas. The advantage of using thematic analysis is quite accessible to less experienced researchers (King, 2004, Braun; Clarke, 2006; Nowell et al., 2017). From the figure above, the second step was to generate initial codes from the dataset, to code the main patterns of the data and finally order data with the applicable code. The third step was to search the theme, therefore, themes were generated in line with the objective, which is to assess the implementation approach of Agri-Park interventions (FPSU and Agri-Hub).

According to Braun and Clarke (2006), “phase four begins after the researcher has chosen and begun to refine the themes and sub-themes (p. 91)”. The fourth step was to review the themes, where themes were assessed, and the thematic map was used to check the validity and reliability of the themes. The fifth step was about defining and naming the themes. Furthermore, the last step was to produce the report, where the final analysis, interpretation and reporting were done and produced. This final step included writing up the outcomes and description of the findings (Braun & Clarke, 2006). The study managed to produce eleven themes in order to achieve the objective.

3.8.3 Objective II. To identify socio-economic factors affecting farmers to participate in Agri-Park mandates in the North West, the Binary Probit Regression Model was used.

Socio-economic factors are very crucial for the study, and it is very significant to understand them for individual respondents. The socio-economic factors of the respondents include gender, age, disability, farm income and off-farm income to mention a few were captured and summarised. Descriptive statistical analysis was employed on this objective and analysed data were presented and summarised using frequency distribution and cross tabulation This gave insight into the study, as it provided empirical evidence if these factors have an impact on the farmers to participate in Agri-Parks mandates.

Binary Probit Model

According to Nagler (2002), the Probit model constrains the estimated probabilities to be between 0 and 1 and relaxes the constraint that the effect of the independent variable is constant across different predicted values of the dependent variable. This is usually practised with the Linear Probability Model (LPM). The Probit model assumes that while we only observe the values of 0 and 1 for the variable Y, there is a latent, unobserved continuous variable Y* that determines the value of Y". The other advantage of the Probit model include believable error term distribution as well as realistic probabilities (Nagler, 1994). Thus, for this study, the Probit model was preferred. We assume that Y* can be specified as follows:

$\gamma^* = \beta_0 + \beta_2 x_{1i} + \beta_2 x_{2i} \ldots + \beta_2 x_3 i + \upsilon_i$ ..... (1)

And that∞

$\gamma_I = 1\ if\ \Upsilon^* > 0$

$\gamma_i = 0$ *Otherwise*

Where $x_1, x_2 \ldots\ldots x_K$. represent a vector of random variables, β represents a vector of unknown parameters and u represents a random disturbance term (Nagler, 2002).

Model specification (Binary Probit Model)

The Binary Probit model specified in the study was applied to predict the following:
Objective 1: To identify and highlight socio-economic factors affecting farmers to participate in the Agri-Park mandate in the North West province (Binary Probit Model).

$\gamma = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \ldots\ldots + \beta_n x_n + \varepsilon,$ ..... (2)

Table 3.2: Description of Binary Variables

Variables	Description	Unit of Measurement	Expected Sign
Y_i	Smallholder farmers participate in the Agri-Park mandate (dependent variable), which takes the value of 1 if smallholder farmers participate, 0 otherwise	Dummy	+
x_1	Size of arable land in hectares	Hectares	+
x_2	Farmers' age in years	Years	+
x_3	Number of years of formal education	Years	+
x_4	Gender; 1 if a farmer is a male, 0 otherwise	Dummy	+
x_5	Marital status, 1 if married, 0 otherwise	Dummy	+
x_6	Membership of farmers' associations (primary co-operative affiliated to secondary co-op of FPSU); 1 if a farmer is a member, 0 otherwise	Dummy	+
x_7	Farming experience in years	Years	+
x_8	1 if a farmer has off-farm income, 0 otherwise	Dummy	+
x_9	Farm-income in Rands per month	Rand (s)	+
x_{10}	Number of visits by Agricultural Extension Officer in the previous year	Per visit	+
X_{11}	1 if a farmer has access to credit, 0 otherwise	Dummy	+
X_{12}	The minimum salary of the workers	Rand (s)	+
X_{13}	Household size	Per head	+
X_{14}	Access to agro-processing	Dummy	+
X_{15}	Access to market	Dummy	+
X_{16}	Funded by government	Dummy	+
X_{17}	Stakeholders' involvement	Dummy	+
X_{18}	Access to mechanisation	Dummy	+
X_{19}	Access to information	Dummy	+
X_{20}	Access to agricultural training	Dummy	+
X21	Type of land ownership	1=Chief Authority 2=Private transaction 3= Renting and / or Share 4= Leased 5= Other	+

3.2:Description of Binary Variables

Source: Author

3.8.4 Objective III. To measure the direct and indirect benefits of the Agri-Park programme in the North West province, the Propensity Score Matching Model was used.

The objective above was used in relation to the question, "What are the direct and indirect benefits of Agri-Parks (FPSU) for smallholder farmers in the North West province?''. In trying to understand the impact (benefits) of the programme, the study assessed whether or not Agri-Parks brings changes (benefits) to smallholder farmers and compare participants and non-participants of the Agri-Parks. For this objective, the Propensity Score Matching model (PMS) was used to assess farmers' observable characteristics by comparing the outcomes of the programme (income) for participants with those of matched non-participants, based on similarity in observed characteristics which minimises the first bias. If not feasible to control these characteristics, PSM estimation becomes biased. Having control farmers from the same communities, as programme beneficiaries, help reduce the risks of such bias.

Dependent variables were derived from direct and indirect benefits, such as income generated from sales, productivity (yield), employment (measured in terms of job creation), and skills transferred via training. In addition, the independent variable, Agri-Park participation, was estimated using a dummy variable indicating whether smallholder farmers should participate (1) or not (0) as non-participants. The estimation of the propensity score, matching, evaluating the quality of matching and evaluating outcomes were conducted to get outcomes relating to the Agri-Park programme's direct and indirect benefits. The basic idea of PSM was introduced by Rosenbaum and Rubin (1983), who observed that self-selection bias can be removed through adjustment (matching) using propensity scores between the treated (adopters) and untreated (non-adopters) groups. PSM has been applied in many studies (Khonje et al., 2015; Ali and Behera, 2016; Christian & Obi et al., 2018; Hermann et al., 2018) to control self-selection bias.

Model Specification

A propensity score (π) for an individual (i) is defined in Rosenbaum and Rubin (1983) as the conditional probability (P) of assigning a participant to a treatment or comparison group (T) given a set of covariates (X), expressed as,

$\pi i = (Ti = 1|Xi)$. ……. (1)

Theoretically, relevant pre-treatment variables are used to derive probabilities of group membership, which are then used to match participants in treatment and comparison groups, such that both groups have equal means or likelihoods of receiving treatment. Once matched, any differences between these groups should be more reflective of the true treatment effects in the population and analogous to the interpretation of the randomised designs.

The main pillars of this model are individuals, treatment and potential outcomes. In the case of a binary treatment, the treatment indicator Di equals one if individual *i* receives treatment and zero otherwise. The potential outcomes are then defined as:

$\mathrm{Yi}\,(\mathrm{Di})$ for each individual *i,* where $i = 1, \mathrm{N}$ and N denote the total population. The treatment effect for an individual *i* can be written as: $\tau i = \mathrm{Yi}\,(1) - \mathrm{Yi}\,(0)$ ..... (1). The fundamental evaluation problem arises because only one of the potential outcomes is observed for each individual *i.* The unobserved outcome is called the counterfactual outcome. Hence, estimating the individual treatment is effect τi is not possible and one has to concentrate on (population) average treatment effects (Smith, 2000).

Y experienced by units in the population of interest.

$\mathrm{Y1i} \rightarrow$ the outcome of unit *i* if *i* were exposed to the treatment

$\mathrm{Y0i} \rightarrow$ the outcome of unit *i* if *i* were not exposed to the treatment

$\mathrm{Di} \in \{0, 1\} \rightarrow$ indicator of the treatment received by unit *i*

$\mathrm{Yi} = \mathrm{Y0i} + \mathrm{Di}\,(\mathrm{Y1i} - \mathrm{Y0i}) \rightarrow$ the observed outcome of unit *i*

$\mathrm{X} \rightarrow$ the set of pre-treatment characteristics

Parameter of interest: The parameter that received the most attention in evaluation literature is the 'average treatment effect on the treated' (ATT), which is defined as:

$\mathrm{ATT} = \mathrm{E}\,(\tau\,|\mathrm{D} = 1) = \mathrm{E}\,[\mathrm{Y}\,(1)\,|\mathrm{D} = 1] - \mathrm{E}\,[\mathrm{Y}\,(0)\,|\mathrm{D} = 1]$ ..... (2)

As the counterfactual mean for those being treated - $E[Y(0)|D=1]$ - is not observed, one must choose a proper substitute for it to estimate ATT. Using the mean outcome of untreated individuals $E[Y(0)|D=0]$ is in non-experimental studies usually not a good idea because it is most likely that components which determine the treatment decision also determine the outcome variable of interest. Thus, the outcomes of individuals from the treatment and comparison groups would differ even in the absence of treatment, leading to a 'self-selection bias'. For ATT, it can be noted as:

$$E[Y(1)|D=1] - E[Y(0)|D=0] = \tau ATT + E[Y(0)|D=1] - E[Y(0)|D=0] \quad (3)$$

The difference between the left-hand side of equation (3) and τATT is the so-called 'self-selection bias'.

The true parameter τATT is only identified, if:

$$E[Y(0)|D=1] - E[Y(0)|D=0] = 0 \quad (4)$$

In social experiments where assignment to treatment is random, this is ensured, and the treatment effect is identified. In non-experimental studies, one must invoke some identifying assumptions to solve the section problem stated in equation (3). Another parameter of interest is the 'average treatment effect' (ATE), which is defined as:

$$\tau ATE = E[Y(1) - Y(0)]. \quad (5)$$

The additional challenge, when estimating ATE, is that both counterfactual outcomes $E[Y(1)|D=0]$ and $E[Y(0)|D=1]$ must be constructed.

Estimating propensity score using binary response model

Firstly, the propensity score was obtained using either Logit or Probit models to predict the probability of participation of smallholder farmers. According to Gujarati (1999), both provide similar results. Thus, for comparative computational simplicity, the Logit model was employed to estimate propensity scores, using smallholder farmers' pre-intervention characteristics (Rosenbaum & Robin, 1983) and matching was then performed using propensity scores of each observable characteristic, which must be unaffected by the intervention. These characteristics included covariate variables that influence the participation decisions and the outcome of interest. The coefficients were used to calculate a propensity score, and participants were matched with non-participants based on having similar propensity scores. In estimating the Logit model, the dependent variable, smallholder farmers' participation in the Agri-Park programme takes the value of 1, if

smallholder farmers participate, and 0 otherwise. The mathematical formulation of the Logit model is as follows:

$Pi = \frac{e^{zi}}{1+ e^{zi}}$……...6

Where, Pi is the probability of participation for the i[th] smallholder farmers and it ranges from 0-1

Zi is a function of N-explanatory variable, which is also expressed as:

Zi=$\beta_0 + \beta_0 + \sum_{i=1}^{k} \beta_i X_i + u_i$.....7

Where,

$i = 1,2,3,4,\ldots\ldots$, n

$\beta_0 =$ Intercept

$\beta_1 =$ Regression coefficients to be estimated or logit parameter

$Ui =$a disturbance term

$xi =$Pre-intervention characteristics

The probability that a smallholder farmer belongs to non-participants is:

$1 - Pi = \frac{1}{1+ e^{zi}}$……...8

Therefore, the odds ratio can be written as:

$1 - Pi = \frac{1+ e^{zi}}{1+ e^{-zi}} = e^{zi}$…… ……9

Now $\frac{Pi}{1-\mathrm{Pi}}$ is simply the odds ratio in favour of participating in the Agri-Parks programme. It is the ratio of the probability that the smallholder farmers would participate in the Agri-Parks programme or interventions to the probability that he/she would not participate in the programme. Finally, by taking the natural log of equation (8), the log of odds ratio can be written as:

$Ln\left(\frac{P_i}{1-P_i}\right) = Ln\left(e^{\beta 0} + \sum_{i=1}^{k} \beta_j X_{ji}\right) = Zi = \beta 0 + \sum_{j=1}^{n} \beta j Xi$ ……10

Where L is the log of the odds ratio in favour of participation in the Agri-Park programme, which is not only linear in xi , but also linear in the parameters.

The Nearest Neighbour (NN) Matching and Kernel matching will be employed in this study.

The Nearest Neighbour (NN) was considered in the study as it is regarded as the most straightforward matching estimator. Caliendo and Kopeinig (2008) this type of matching consider an individual from a comparison group to be chosen as a matching partner for a treated individual that is closest in terms of propensity score (NN matching can be done with or without replacement options). In the case of the NN matching with replacement, a comparison individual can be matched to more than one treatment individual, which would result in increased quality of matches and decreased precision of estimates. According to Becker and Ichino (2002), the Kernel matching method is used when all treated units are matched with a weighted average of all controls with weights, which are inversely proportional to the distance between the propensity scores of treated and controls. Therefore, the study used Kernel weights, whose contribution is based on each comparison group member so that more importance is attached to those comparators providing a better match.

Table 3.3: Variables Used in Propensity Score Match Model

DEPENDENT VARIABLE(S)	INDEPENDENT VARIABLE(S)	PRIOR EXPECTATION
Variable: Direct and indirect benefits of the Agri-Park programme	Agri-Park participation takes the value of 1 if smallholder farmers participate, 0 otherwise	+/-
Outcome Variables		
Agricultural Income (sales)		+/-

Table 3.4 Summary of study objectives and analytical tools

Specific objectives	Analytical tool
1. To assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province.	Thematic Analysis
2. To identify and highlight socio-economic factors affecting farmers to participate in the Agri-park mandate in the North West province.	Binary Probit Model
3. To measure the direct and indirect benefits of the Agri-Park programme in the North West province.	Propensity Score Matching Model

3.9 Reliability and validity/data trustworthiness

According to Kimberlin and Winterstien (2008), the pieces of evidence of validity and reliability are the prerequisites to ensure the integrity and quality of the measurement instruments. The study used both qualitative and quantitative research information to provide correct and reliable results. Blumberg et al. (2005), discovered that reliability measures supplies that are consistent and precise to the results with equal values. The convergent design was used to compare findings from both data sources (qualitative and quantitative). Both data sources were used at the same time, assessing information using a parallel construct, and then analysing and comparing both forms of data to create a solid foundation towards drawing up conclusions. Inferential statistics assisted in measuring consistency and testing the hypothesis. The descriptive statistics provided a summary of the data. To maintain the study's reliability, data were repeatedly tested. Chakrabarty (2013) noted that repeating the test ensures validity, hence, the data applied will result in accuracy.

3.10 Ethical consideration

This is an ethical requirement in most research. Issues of ethical concerns on privacy and confidentiality were considered. Participants were assured of anonymity and confidentiality of their given information. Information provided by the participants in the research was kept and treated with confidentiality and the information was kept between the researcher and the participants only. According to Paul (2010), ethical issues raised by the research process require that human beings are treated with respect, should not be harmed in any way and should be fully informed about what is being done to them. According to Creswell (1998), the researcher should respect the rights, needs, values and desires of the informants.

The respondents participated in this study voluntarily and were free to withdraw from the study if they felt so. Importantly, their details were not used and disclosed to the public. The researcher obtained permission to conduct this study at the North West University (at various levels of committees, such as the Departmental and School level Committees that man the ethical committees). In addition, permission was requested from the Department of Rural Development and Land Reform where officials were interviewed telephonically, and questionnaires were sent via emails. Due to the Covid-19 pandemic, some of the smallholder farmers were uncomfortable being interviewed face-to-face. Thus, some interviews were conducted telephonically, whereas other groups of farmers were interviewed face-to-face, as Level 3 of Covid-19 allowed meetings or gatherings. The Covid-19 lockdown regulation was maintained and treated with respect.

3.11 Chapter summary

The chapter presented the research design used in the research and the methodologies of data collection and analysis. A brief description of the study area, research paradigm, research approach, research design, population and sample and sampling techniques were captured. Besides, data collection instruments, data analysis, reliability and validity/data trustworthiness and ethical considerations were also covered in this chapter The mixed method approach was used to combine the quantitative and qualitative methodologies. The sampling techniques used in the research were also

explained. The smallholder farmers were interviewed using a structured questionnaire and the key informant interviews, using a structured questionnaire, were discussed in detail. The next chapter focuses on data presentation and analysis of major findings. The methods used for analysis were based mainly on smallholder farmers' data, collected from 128 smallholder farmers. The results to be presented in the next chapter were based on statistical analysis describing the smallholder farmers' demographics and socio-economic factors.

To assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province, a qualitative method was used, and thematic analysis was used to provide themes to answer the research questions. Given a set of explanatory variables, the Binary Probit regression model allows one to estimate the probability of a certain event occurring or not, by predicting a discrete dichotomous dependent outcome. Therefore, the first model estimated the probability that the farmer would participate in the Agri-park programme. Furthermore, to assess the socio-economic factors affecting farmers' participation in the Agri-Park mandate, the Binary Probit regression model was considered. Lastly, to assess the direct benefits of the Agri-Park participation on farmers' income, a Propensity Score Matching (PSM) technique was used to compare the differences in incomes received by the farmers.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter is divided into three sub-sections. Section 4.2 begins by discussing the findings of the analyses of the data based on the socio-economic and demographic factors of smallholder farmers towards Agri-Park participation. The characteristics are categorised according to human, financial, natural and social aspects. However, to assess the impact of the Agri-Park participation, frequency distribution measures were calculated to summarise and outline the farmers' socio-economic factors. The descriptive results data were presented in tables, graphs and charts. Section 4.3 begins by discussing the findings of the objective 1: the implementation approach of the Agri-Park interventions towards Farmer production Support Units (FPSU) and Agri-Hub in the selected areas.

Lastly, Section 4.4 is divided into two sections. The first part consists of a Binary Probit model and the second part consists of the Propensity Score Matching model outcomes. The Binary Probit model was used to analyse objective 2: the socio-economic factors affecting smallholder farmers' participation in the Agri-Park programme. Hence, the Propensity Score Matching model was used to analyse objective 3: the direct and indirect benefits of the Agri-Park programme. The Binary Probit regression model was estimated using SPSS and the Propensity Score Matching model was estimated using the Stata version 15.

4.2 Demographic and socio-economic factors of the smallholder farmers

The main objective of this study is to identify and assess the socio-economic factors affecting smallholder farmers to participate in the Agri-Park mandate programme. The focus is to identify factors affecting farmers whether or not to participate in the Agri-Park programme within the selected areas. It is very significant to understand the socio-economic factors of the farmers within the study, as this determines the element of participation because socio-economic factors can influence smallholder farmers to participate in agricultural farming. Table 4.1 presents the findings based on socio-economic factors and demographics of smallholder farmers, such as educational level,

gender, marital status, education level, employment, land acquired (ownership), age, household size, farm experience and land hectares.

Table 4.1: Smallholder farmers' demographic factors

Variable	Description	Agri-Park Participants farmers (N=64)		Agri-Park Non-participants farmers (N= 64)		Overall Sample (N=128)	
		N	%	N	%	N	%
Gender	Male	39	60	35	55	74	58
	Female	25	40	29	45	54	42
Marital Status	Single	21	33	23	36	44	35
	Married	30	47	29	45	58	45
	Divorce	4	6	5	8	9	7
	Widowed	9	14	7	11	17	13
Education level	Never went to school	3	5	0	0	3	3
	Primary	17	26	13	20	30	23
	Matric	31	50	36	56	67	52
	Post-Matric	11	17	10	16	21	16
	Abet	2	2	5	8	7	6
Employment	Government	1	2	2	3	3	3
	Self-employed	60	93	59	92	119	92
	Unemployed	0	0	2	3	2	3
	Other	3	5	1	2	4	2
Land Acquired (Land Ownership)	Leased	9	14	2	3	11	9
	Inheritance	15	23	14	22	29	23
	Tribal Authority	35	58	37	55	72	56
	Renting	5	8	11	17	16	12
	Participant			**Non-Participant**			
	Min	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**
Age	28	73	47.06	10.37	33	73	52.66	1028
Household size	5	11	7.25	1.79	3	10	6.00	1.72

Farming experience	5	35	14.53	8.33	3	34	11.39	6.77
Land Hectare	10	3000	648.86	965.32	1	2500	389	651.56

Source: Results from SPSS (Version 27), generated from Survey, 2021

The results in Table 4.1 summarise the gender distribution of the interviewed smallholder farmers who are the participants and non-participants within the selected areas. The outcomes indicate that most smallholder farmers within the selected study area are male dominated with an overall percentage of 58% and the female, 42%. The results concur with the study of Nkonki-Mandleni et al. (2022), who indicated that most male farmers are more dominant in the farming business. Besides, this finding is in line with the fact that agriculture in Africa is characterised by the use of crude and highly labour intensive (encouraging drudgery) implements, which are detrimental to the health status of the users, and in long run, discourage women participation. The less domination of women in the study (42%) also concurred with the study of Sibiya and Hurly (2011), who emphasised that women's participation in agriculture is hindered by numerous factors, such as unavailability of land, a lack of production inputs, a lack of credit and a lack of training and information, compared to the males who have more opportunities in accessing such resources. The results are also presented in Figure 4.2 below.

The Gender of the smallholder farmers

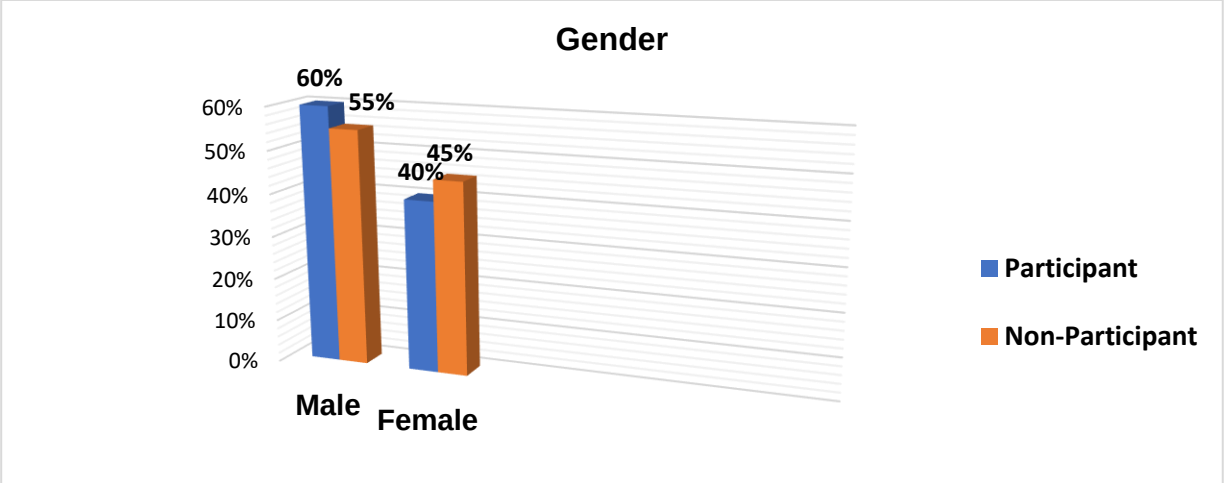

Figure 4.1 Gender of the smallholder farmers
Source: Results from SPSS (Version 27), generated from Survey, 2021

Figure 4.1 The overall results for gender participation in the study indicates that smallholder farmers who participate in the Agri-Park programme are more male dominated (58%) compared to female (42%) . Hence, the majority of male smallholder farmers who participated in the programme (60%) were more compared to the female participants (40%). These results showed that most males are still dominated in the agricultural farming sector compared to women. The results also indicate that participant male farmers are more (60%), compared to the non-participant farmers (55%) within the selected areas in the study.

The result shows that participant female farmers are fewer compared to the non-participant farmers concurs with the finding of Gandidzanwa et al. (2021), who emphasised that male beneficiaries are more likely to achieve commercial viability compared to female beneficiaries because of gender inequality literature that has long identified disparities in performance across gender equity, mostly in the land reform programme in South Africa. Accordingly to Mazibuko et al. (2020), the participation of women in smallholder farming remains a challenge in the North West Province. The study also concluded that this could be attributed to the fact that most smallholder farmers sampled for the study were made up of more males than females. This finding is also consistent with those of Antwi and Oladele (2013) and Njobe (2015) who found

that agriculture is mostly reserved for males while women are expected to perform domestic activities in the household.

4.2 The ages of smallholder farmers

The results in Table 4.1 showed the distribution of smallholder farmers' ages. The minimum age of the smallholder farmers in the Agri-Park participation is 28 years, whereas the youngest age for non-participants is 33 years. The maximum age for both participants and non-participant farmers is 73, with a mean of 47 for participants and 53 for non-participants. The findings suggest that only a few of the youth are participating in agriculture, hence, most adults are more engaged in agricultural farming.

4.3 Farming experience

The results in Table 4.1 show that the minimum experience of the participant farmers is 5 years and for non-participant farmers is 3 years. This means that most participant farmers within the Agri-Park programme are more experienced than non-participant farmers. The average mean for participants is 15 years and for non-participant farmers is 11 years. The variable farming experience is very crucial when it pertains to the selection and participation in the Agri-Park programme because the more experienced the farmers are, the more knowledgeable they are in the entire production cycle of the businesses. According to DRDLR (2015), farming experience is one of the values that boosts farmers to acquire land, and funding and to participate in most programmes offered by the DRDLR.

The above result that farming experience is one of the values that boosts farmers to acquire land and funding and participate in most programmes offered by the DRDLR concurs with the study results of Kirsten et al. (2016), who indicated that the farming experience factor has an impact on the overall performance of redistributed farms. This means farmers with more farming experience are preferred when it comes to the criteria of funding support. They are regarded as having more knowledge and experience in the farming lifestyle. Furthermore, this is in line with the study of Kom et al. (2022), who discovered that possessing many years of farming experience implies that one is better informed about climate variability, change in relation to crop production and the use of adaptation strategies. This means that the experience of a farmer is an advantage for them to participate in the Agri-Park programme.

4.4 Land Hectares

This variable is regarded as continuous and was measured as the total size of the land in hectares acquired by farmers within the study areas. It is very important to know the scale or portion of the land that the farmers are producing on. Besides, it is a very important aspect of farming and it determines productivity and enhances the income level of the farmers, to mention a few factors. The results in Table 4.1 depict that the minimum land hectares were 10ha for participant smallholder farmers and for non-participant farmers, it was 1 hectare for crop production. The maximum hectares for participant farmers was 3000 ha, whereas 2500ha was for non-participants in livestock production.

4.5 Household size

The variable household size is very significant to most agricultural farmers because most family members inherit farming as their lifestyle and assist as labourers within the farming business. Most cooperative entities are formed by family members that create jobs for themselves for the larger the family, the more they engage in farming together. The findings indicate that the minimum size of household size for a participant is five members and with a maximum of eleven members and for the non-participant, it is three members and with a maximum of ten within their households.

4.6 Marital Status for smallholder farmers

Variable marital status is very vital in determining the involvement in agricultural projects. The findings in Table 4.1 indicate that the marital status of smallholder farmers is categorised into different groups, such as single, married, divorced and widowed. The results shows that the most dominant and stable farmers are the married groups, where 47% represents married participants and 45% represents non-participant farmers. The result also showed that single farmers are the second domination in the study, with 36% of non-participants higher than participants, with 33%, which means that most single farmers are derived from small-scale farmers that did not benefit from the Agri-Park programme. Most divorced and widowed farmers had a small percentage in the study.

4.7 Level of education of the smallholder farmers

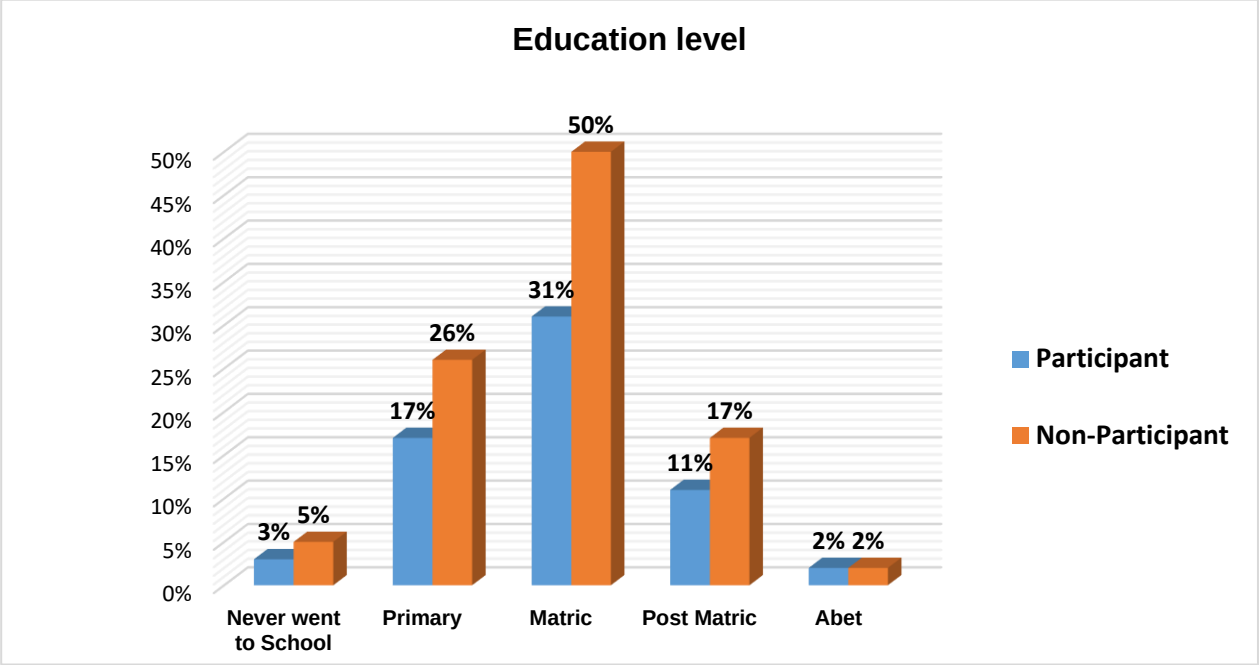

Figure 4.2 Education Level

Source: Results from SPSS (Version 27), generated from Survey, 2021

Sifundza (2019) emphasised that education and a skilled workforce are key to the success of every sector of the economy, including agriculture. Figure 4.2 shows the different distribution of the level of education categories. The most dominant category is matric, where non-participants represent the highest percentage of 50% and the participants indicated 31%, with the overall percentage of 52%, which means that most farmers that are not participating are more educated than farmers that are participating in the programme. However, the outcomes also showed that there are still farmers operating without any education acquired, where the participants contributed 3% and 5% is for the non-participants.

4.7 Employment of smallholder farmers

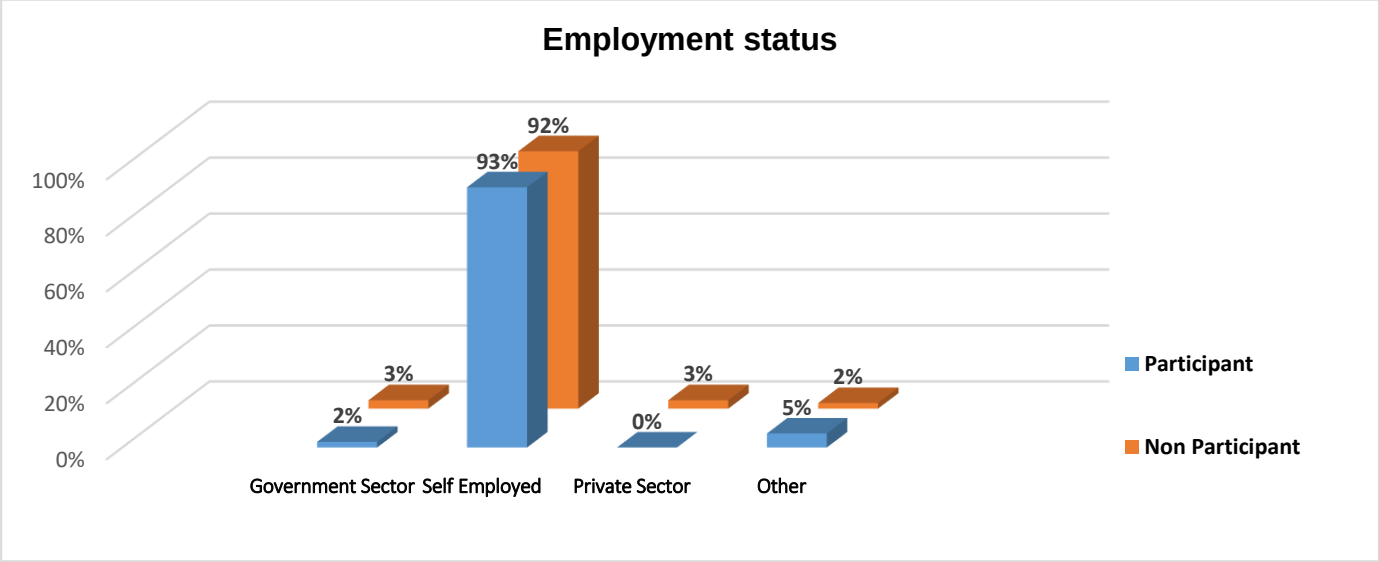

Figure 4.3 Employment status of the smallholder farmers
Source: Results from SPSS (Version 27), generated from Survey, 2021

Figure 4.3 above illustrates that most of the smallholder farmers are self-employed, with an overall percentage of 92%, while the participant farmers constitute 93% as 92% is for the non participant farmers. The findings indicated that most farmers are the main drivers of their businesses, which means they practise farming full-time. Fewer farmers are involved in other businesses (off-farm) to enhance their income level and most off-farm businesses are catering, shops, and logistics while 5% are participant farmers. Only 2% is for non-participant farmers. This means that most farmers are self employed within the study area , and their main focus is farming full time in oder to generate more income within their projects. Farmers that are affiliated within the program are farmers who are always busy within their project as their take their farming as business.Most farmers elaborate that farming require more time and it is faced with more challenges that require more time to focus, and work hard e.g. climate ,preparation ,planting, harvesting and marketing.The value chain for the farmers is very long and require focus,hence the result support the state of farmers to work full time in oder to take care of every aspect that comes with farming process.

4.8 Land acquired by smallholder farmers

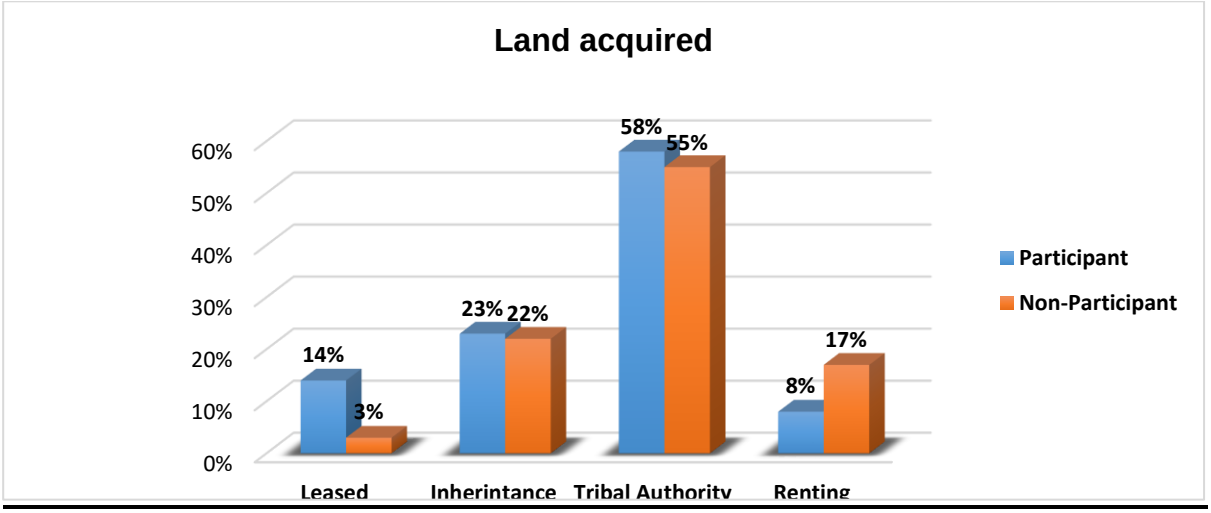

Figure 4.4 Land Acquired

Source: Results from SPSS (Version 27), generated from Survey, 2021

Land ownership is very important in farming. The results above in Figure 4.4 show that most farmers within the study area occupied their land through the tribal authority as much of the land was allocated by the chief as most practised in communal land. Participant smallholder farmers dominate with 58% of the land allocated by a chief and 55% is for non-participants, which was authorised with a letter of permission from the chief's authority. The findings also show that 23% of land for participant farmers was occupied through inheritance, while 22% was allocated to non-participants. The outcomes also reveal that fewer farmers have leased the land, where 14% belongs to participant farmers and 3% to the non- participants. The results also showed that 17% of the land was rented by the non-participants, whereas 8% was rented by participant farmers. The results concur with Odunze et al. (2015); Rondhi et al. (2020), who found that large-scale farming had impact to participate into farming contracts and various programmes. This means that the the Agri-park programme favours more farmers that are operating with large land space as it make it easy to hire tractors to do the work and have more returns. Hence the land ownership played a huge role when it comes to programme requirements and submitting land permission to occupy documents,favours the farmer to participate within the program.

4.9 Agricultural Participation

4.9.1 Agri-Park Participation

Agri-Park participation is when smallholder farmers are participating in the programme that is offered by the Department of Agriculture, Land Reform and Rural Development and it is championed by the directorate, Rural Enterprise and Industrial Development, which is now called Cooperative Enterprise Development, together with the sister unit, Rural Infrastructure Development. The mandate of the programme is to support farmers with basic services, such as the provision of production inputs, mechanisation hiring, training, extension services and markets so that farmers can shift their farming dimensions to make some income for sustainable business.

The Rural Infrastructure Development unit is more responsible for buildings such as storage, agro-processing, roads, livestock crush-pens or kraals, renovation of infrastructures so that the parks are at the best level, drilling boreholes and electricity installation, to mention a few. Farmers that are participating in the programme are registered entities, such as the primary cooperatives and sole proprietorship enterprises that are affiliated with the umbrella secondary cooperative, which is responsible for leading the programme with the management of the department (REID officials).

4.9.2 Specialised commodity produced by smallholder farmers

Agricultural farming is more significant and practised in most rural areas as it alleviates poverty and creates employment and food insecurity. In this study, farming was categorised into two, that is, crop and livestock farming. According to DRDLR (2015), Agri-Parks have been demarcated according to the commodity of specialisation and are selected based on the suitability of the locality of the FPSU and Agri-Hubs established within different provinces. The selected commodities in the North West province selected under the umbrella of Agri-Parks are crops and livestock, hence this study only focused on small-scale farmers that produce crops and livestock. There are small-scale farmers that only produce crops, such as sunflower, barley, wheat, Lucerne, maize and vegetables and most farmers practised crop rotation. Some farmers specialise only in livestock production, such as cattle, goats, sheep, poultry and piggery, that were considered in this study. All small-scale farmers (participations and non-participants)

have the same goal to increase food security, create jobs and increase income in their different projects.

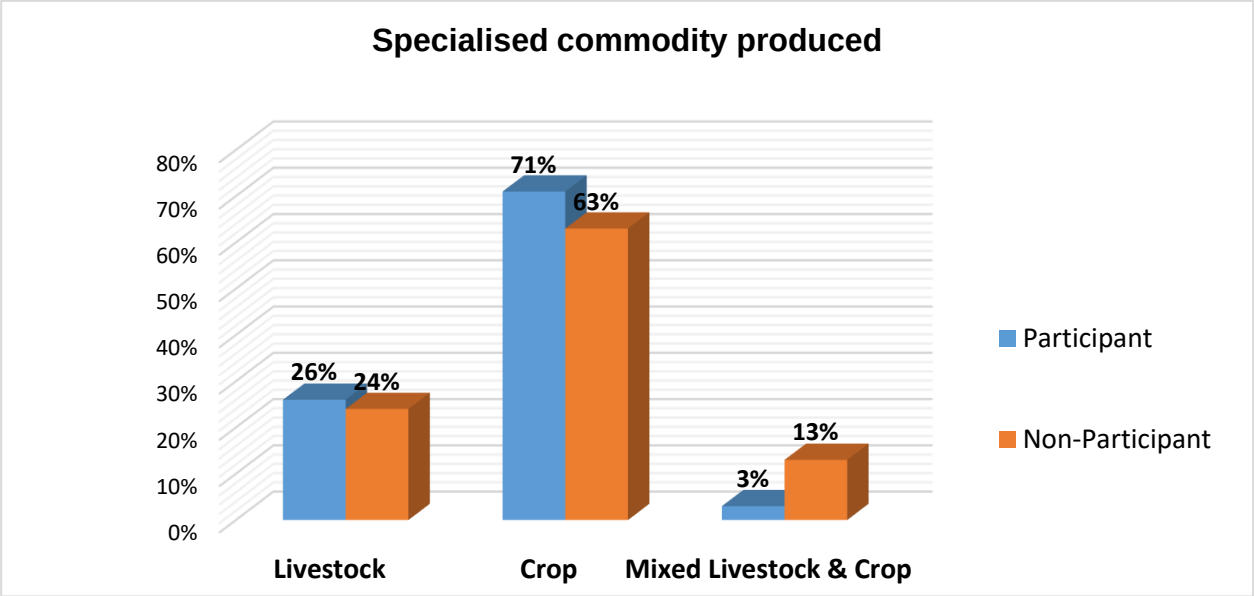

Figure 4.5: Specialised commodity produced
Source: Results from SPSS (Version 27), generated from Survey, 2021

The findings Figure 4.5 indicate different types of commodities specialised within the selected study areas, and most smallholder farmers are producing different crops, with 71% of the crops produced by the participants and 63% crops produced by the non-participants. Furthermore, some farmers produce under an irrigation system and others are producing on dry land. The second category is livestock farmers who are farming various livestock, such as cattle, goats, poultry, sheep and piggery; 26% are farmers who are participants and 24% are non-participants. Only a few farmers are under the mixed farming category, as only 3% are participant smallholder farmers, whereas 13 % are non-participant farmers.

4.9.3 The types of crops produced by smallholder farmers

Smallholder farmers in the study are involved in agricultural farming where they are growing, producing various crops and keeping animals to increase food security and sell the raw materials. Farming in rural areas has decreased to some extent; rural people tend to behave like their urban counterparts and only farmers who have passion are more dominant in farming and producing food. According to Emran et al. (2021), the most important factors for increasing crop productivity per unit area are asset

endowment and crop management practices, respectively. Hence, crop management is when farmers are practising agriculture in order to achieve better yield of crops, and improve the growth in farming. This means most farmers should practise greater cropping intensity (crop rotation) to diversify their production and increase income for their projects.

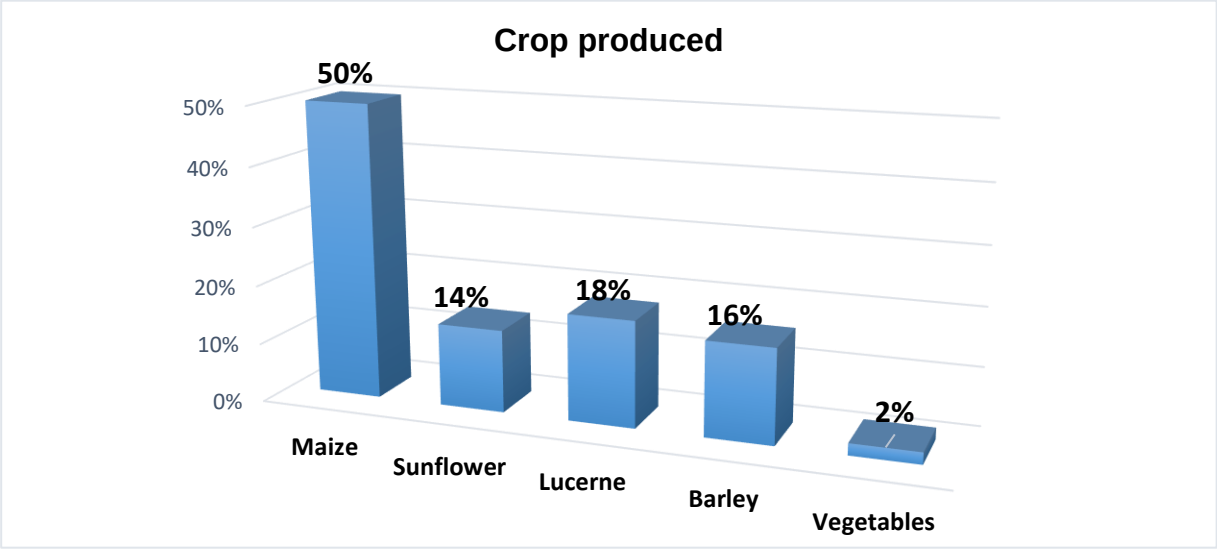

Figure 4.6: Specialised crop produced

Source: Results from SPSS (Version 27), generated from Survey, 2021

Pawlak et al. (2020) note that ensuring food security has become an issue of key importance to countries with different degrees of economic development, while the agricultural sector plays a strategic role in improving food availability. Most farmers in the study are engaged in crop production as basic farming for most rural smallholder farmers and it contributes to the livelihood of the farmer and food security. Crop production is mostly practised in rural farming, as most black farmers have more knowledge and experience in farming. Figure 4.6 indicates various crops produced by selected smallholder farmers in the study. The smallholder farmers in the study are producing 50% of maize production, both produced under dry land and the irrigation system. This means that farmers within the selected districts, such as Dr RSM, Bojanala Platinum and Ngaka Modiri Molema, are dominating in maize production. The second dominating crop is lucerne, with 18% and 16% is produced barley, which is mostly practised in DR RSM district in Greater Taung local municipality. This is made possible because they have the advantage of irrigation schemes or water availability, which

means these crops are produced under an irrigation system (the usage of a sprinkler irrigation system) and most farmers have water rights with the Vaal-harts water association. The result also indicated the third dominated crop, with 14%, which is sunflower and is mostly produced in the Ngaka Modiri Molema region and the Bojanala platinum district. The last crop dominating is vegetables, with only 2%, which means only a few farmers in the study area are producing vegetables.

Figure 4.7: Specialised livestock

Source: Results from SPSS (Version 27), generated from Survey, 2021

The results in Figure 4.7 illustrate that farmers in the study are engaging in livestock production as basic farming for most rural smallholder farmers and it contributes to their livelihood as farmers. The North West province is one of the provinces that is dominated by farmers who are farming livestock, especially cattle, due to their geographical aspect that allows grazing of cattle. The results reveal that most farmers in the study area are farming with cattle production at 60%, 20% for goat production, 10% for sheep production, 6% for piggery production and only 4% for poultry production. According to DRDLR (2016), the selected commodities for livestock are cattle, goats and poultry in the North West Province and those farmers are best placed to participate in the programme. In Dr Ruth Segomotsi Mompati, Bojanala platinum and Ngaka Modiri Molema district, the most dominated and preferred livestock are cattle and goats, which means farmers that are farming with cattle and goats are most favourable to participate in the programme. Furthermore, farmers that are based in the Kenneth Kaunda district are privileged to participate in the programme if they are farming poultry, as the district is selected for poultry commodities.

Table 4.2: The level of distribution of smallholder farmers' income

	N	Min	Max	Mean	Standard Error	Stand Deviation
Income Participant	64	R86.000,00	R640.000,00	R325.060,7813	R16.509,91647	R132.079,33178
Income Non-Participant	64	R22.000,00	R540.000,00	R160.037,0312	R11.554,60246	R92.436,81970
Total Farm Income	128	R22.000,00	R640.000,00	R242.861,4063	R12.402,60751	R140.319,48595

Source: Results from SPSS (Version 27), generated from Survey, 2021

Table 4.2 above demonstrates the level of distribution of income that farmers are receiving in their various projects. The level of income is a very significant factor that assists farmers to see if they are operating at a loss or a gain and it is an aspect that determines the efficiency of the business. The results illustrate that participant farmers' minimum income is greater than R86.000,00, compared to non-participant farmers with R22.000,00. The outcome means that farmers who are in the Agri-Park programme are better off or benefit from the income they are generating. The highest income received by participant farmers is R640.000,00, with the average mean of R325.060,7813 and the standard deviation of R132.079,33178. Furthermore, the non-participant's highest revenue is R540.000,00, with an average mean of R160.037,0312.

The results show that there is great access to income generation from participants compared to farmers that are not affiliated with the secondary cooperative umbrella that services the Agri-Park because the programme assists with the market access such as monthly auction and market referrals . Futhermore, this is the right evidence to prove that farmers that affiliated under the umbrella secondary cooperative under FPSU are making income due to the fact that they are receiving services within the programme. Participate farmers within the programme are benefiting with hiring mechanisation with lower rates, access to free various agricultural trainnings, access to production inputs which made it easier to have less expenditures in their projects.

4.10 Water source for smallholder farmers

FAO (2022) reports that sustainable and equitable management of water resources is a key element of sustainable food systems and essential for achieving Zero Hunger.

This means that water is a source of life and a need in the farming sector; it plays a crucial role in promoting efficient farming and a lot of yields. Nevertheless, FAO (2020) attested that water scarcity (the imbalance between supply and demand of freshwater) and water quality issues are increasingly threatening food security and nutrition through their impacts on food systems from agricultural production through food processing to households and consumers.

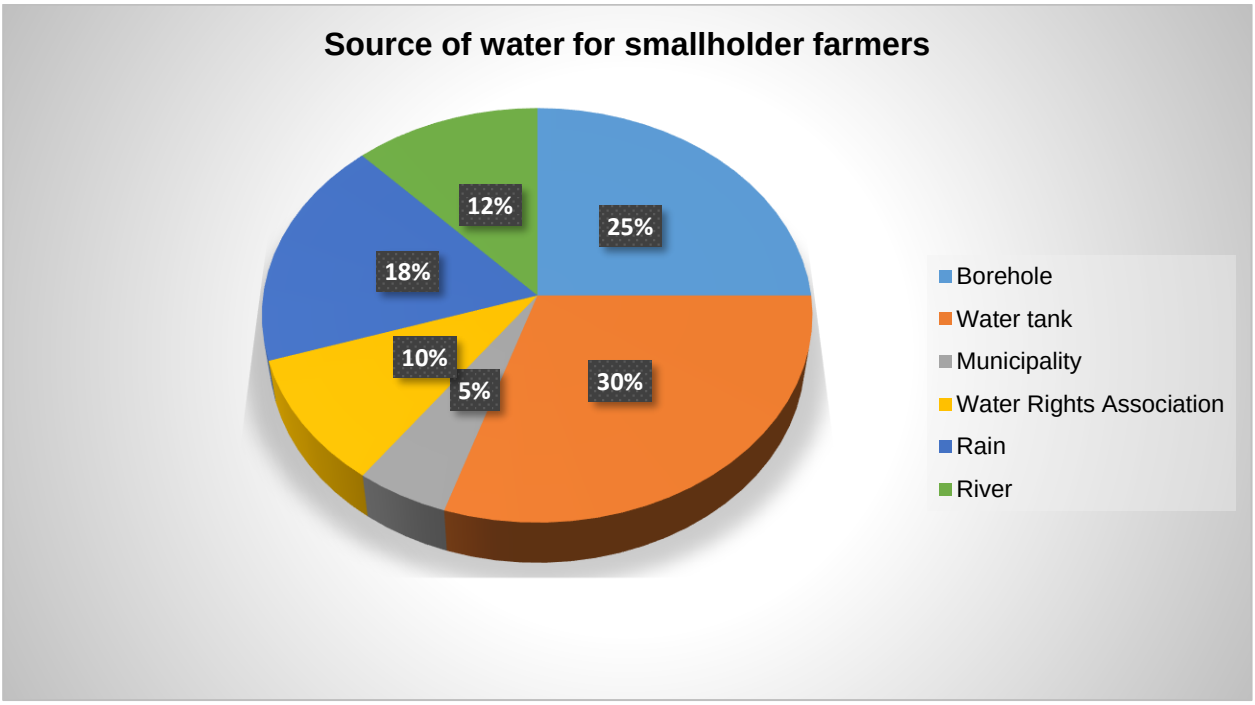

Figure 4.8:Source of water for smallholder farmers
Source: Results from SPSS (Version 27), generated from Survey, 2021

The outcome shows that smallholder farmers within the study areas are accessing water from different sources, such as boreholes, municipalities, Vaal harts water rights association, rain, and river and stored water in tanks for future use. The findings showed that 30% 0f smallholder farmers have access to water tanks as part of storage because most rural areas have issues with water availability and water is a crucial factor in promoting productivity. From the study, 10% was contributed by the Taung irrigation farmers who access water from the Vaal harts water rights association. Those farmers have water rights certificates and plant crops under the irrigation system. Most farmers that are producing under dry land depend on 18% of rainfall and 12% of river water, which is very challenging since the rain capacity is very low and depends on climate.

4.11. Agri-Park benefits received by participants (FPSU and Agri-Hub)

According to DRDLR (2015), the Agri-Park programme was designed and initiated as a model that focused on building rural transformation for rural farmers. Most black rural farmers have many constraints that they are facing with their businesses. The programme was initiated to try to tackle rural under-development and slow growth in income generation of the rural black farmers, access to mechanisation and the provision of production inputs and pieces of training as most farmers are struggling with access to such basic services. The productivity is still low, low income, and lacks mechanisation, so the concept was then adopted. Agri-hub is where the production, mechanisation hire, processing and logistics are at the centre to provide services closer to farmers and act as a market (DRDLR, 2015).

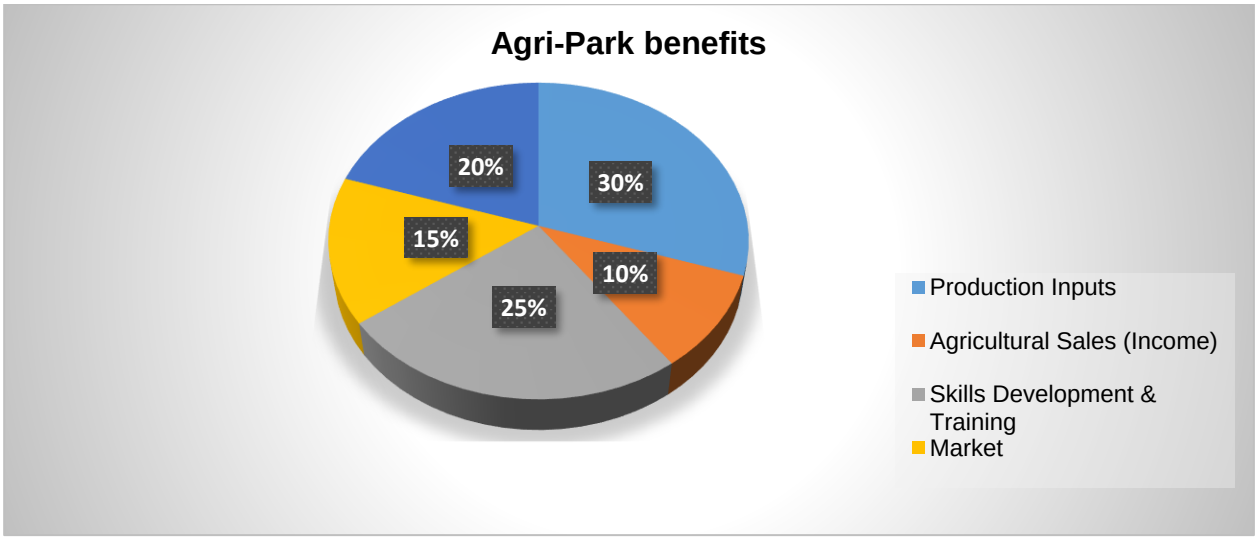

Figure 4.9: Agri-Park benefits
Source: Results from SPSS (Version 27), generated from Survey, 2021

The findings from Figure 4.9 indicate that Agri-Park participants have benefitted directly and indirectly from the programme and the benefits are production inputs, agricultural income, skills development through various pieces of training and market and access to hired mechanisation. The outcome showed that 30% of smallholder farmers

participants received assistance in form of inputs from the Department of Production, 25% were upskilled while 20% were participants who had access to hired mechanisation from farmers' production support units. Furthermore, the participants had the privilege of participating in the market via auctions as part to increase their project income by 10%. According to Gandidzanwa et al. (2021), beneficiaries selected for the programmes should best be capacitated after they have been recruited into the programme to maintain farm profitability and a sustainable agricultural production value chain.

4.12 Factors affecting smallholder farmers' participation in the Agri-Park programme

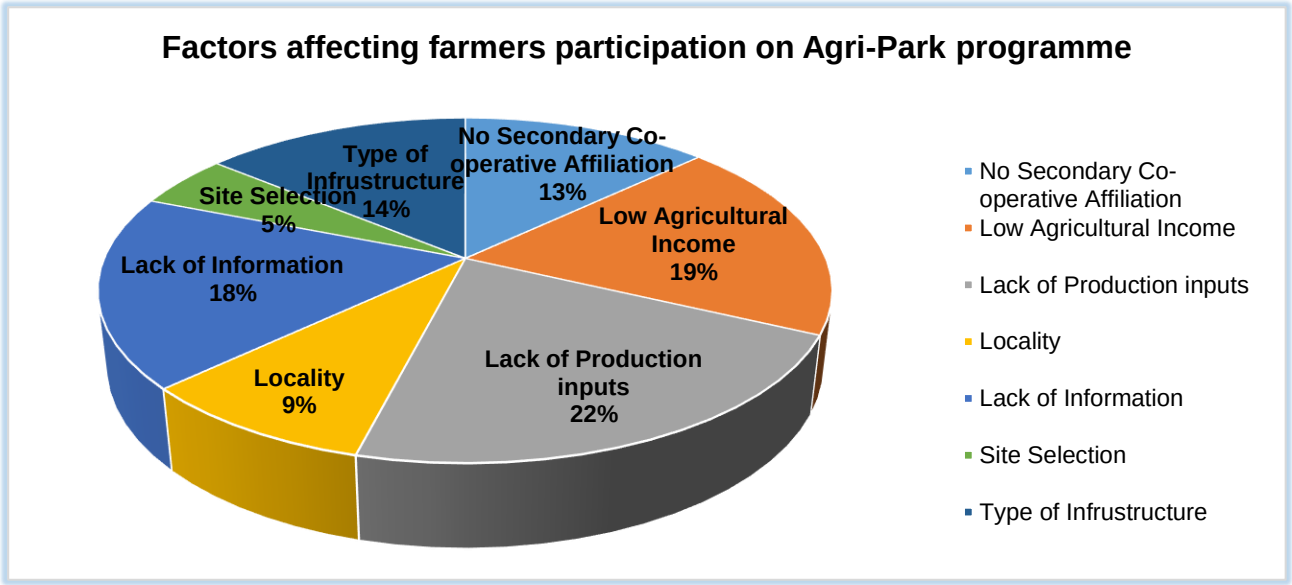

Figure 4.10: Factors affecting Agri-Park participation
Source: Results from SPSS (Version 27), generated from Survey, 2021

Figure 4.10 demonstrates the outcome of factors that affected farmers, not to participate in the Agri-Park programme mandates, whilst those factors affected their projects not to break even and operate at a loss. The most dominating factor that hindered participation is the lack of production inputs, with 22%, which has a positive impact to enhance the productivity of the farmer. The outcome also depicts the poverty challenges that non-participants are facing where the majority of smallholder farmers do not generate income (19%) that maintains their livelihood and sustains their project. Most of the

farmers are still struggling with information about the Agri-Park mandate and its benefits, thus this also contributed to farmers not participating with 18%. This means that government officials should disseminate the information to reach most rural smallholder farmers about the programme's objectives.

The type of infrastructure with 14% per FPSU and Agri-hub also hindered smallholder farmers not to participate due to the type of commodity specialised in being unaccommodated within the selected areas. One criterion for the Agri-Park requirements for participation is to be a registered member of a secondary cooperative umbrella, where primary cooperatives, including private entities affiliate to be a beneficiary. Sadly, most farmers are not affiliated with the secondary cooperatives with 13%. The findings also depict that locality (distance) to the selected FPSU and Agri-Hub constitutes 9% and the site selection contributes 5%, which illustrates that there are farmers who are struggling with the distance to the selected site of the Agri-Park zone.

4.13 Transportation to the market by smallholder farmers

The mode of transport to market place is very significant for most farmers, as it plays a role in increasing the income level of the project after the selling process. Figure 4:11 below shows different types of transport modes that farmers used in the study. The type of transport used by farmers is categorised as follows; self-owned transport, transport hired and collective transport that is used by the group.

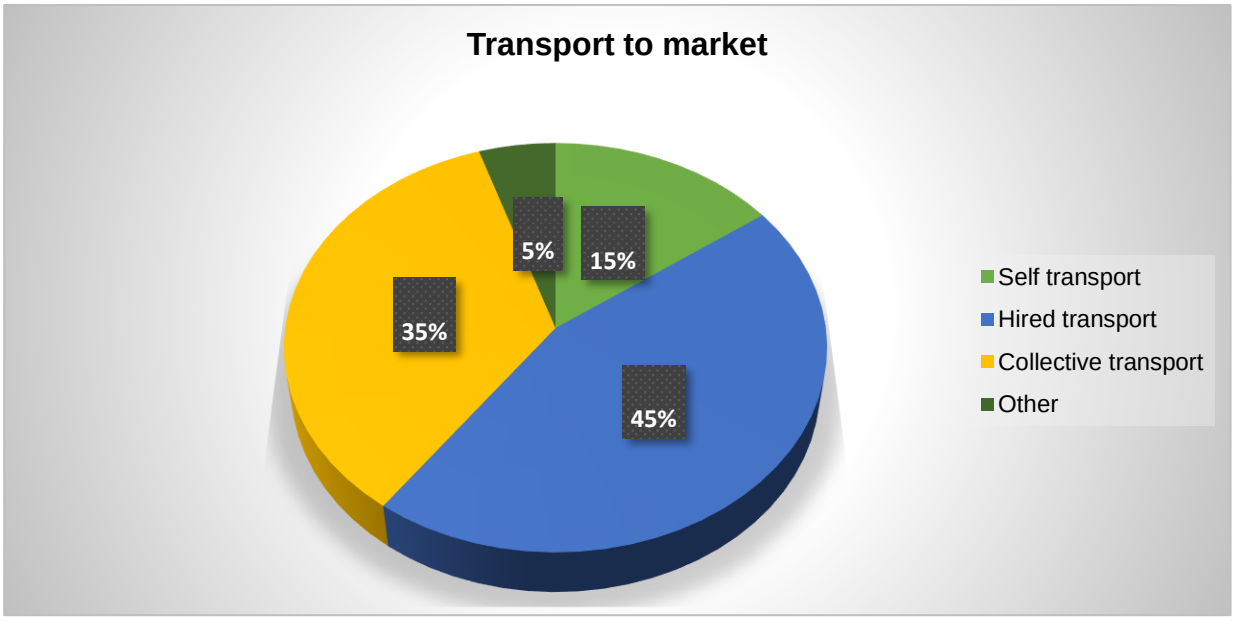

Figure 4.11: Transport to Market

Source: Results from SPSS (Version 27), generated from Survey, 2021

Figure 4.11 illustrates the modes of transport used by the smallholder farmers to the market. The outcome depicts that the majority of smallholder farmers used hired transport to reach the market (45%). This means that this is very crucial for the department to procure more mechanisations and hired them to farmers at lower rates to minimise the cost incurred when hiring transport to other private entities. The second category is collective transportation, which constitutes 35%, which portrays that it is very important to assist farmers that will use collective transport, as it reduces costs, hence it is supported by the mandate of the Agri-Park, which deals with the secondary cooperative umbrella and collectively assists farmers. Smallholder farmers that have the advantage of having their self-transport constitute 15%, but most farmers raised concern that their transport cannot deliver goods in bulk. Some of the mechanisation is not in good condition and hinders much of the progress in their projects, especially in reaching the market where sales are generated.

4.14 The market constraints of the smallholder farmers.

Most farmers in the study area are faced with many different challenges in marketing their produce to various market outlets. The main aim of farming is to produce different commodities that will reach the target market, but many farmers are still struggling to find the right formal market that will yield income for their businesses. Figure 4:12 below shows different obstacles faced by farmers in marketing their businesses.

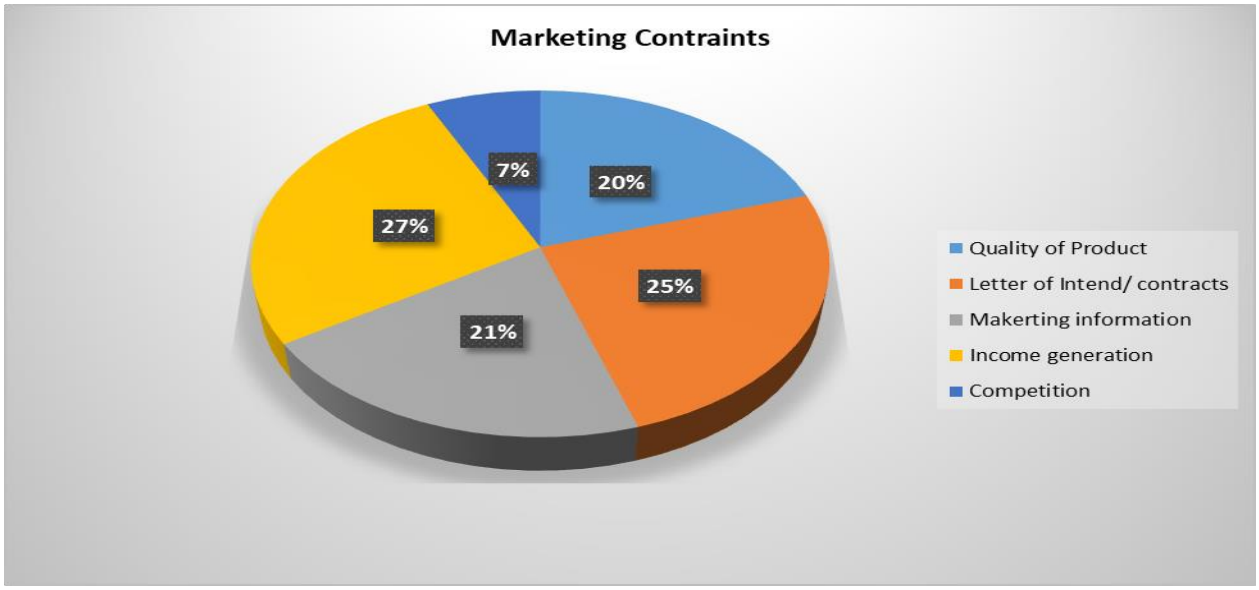

Figure 4.12: Marketing Constraints

Source: Results from SPSS (Version 27), generated from Survey, 2021

According to CSIR (2016), the Agri-Hub is a production, equipment hire, processing, packaging, logistics and training (demonstration) unit. The market is an important aspect to enhance farmers' profitability in their projects. Figure 4.12 shows the outcome of the study about the constraints they are facing in their projects. The findings indicate that quality of product constitutes 20%, a lack of acquiring a letter of intent or contract contributes 25%, a lack of marketing information at 21%, low-income generation at 27% and competition (7%). The majority of smallholder farmers have a challenge with market accessibility, where their final product will be sold and then make income for their sustainability in their projects. Farmers can produce so many tonnes but getting a proper letter of intent agreement is the most difficult issue that farmers are facing, therefore with Agri-Park as the market for farmers, at least those participant farmers will benefit as the mandate of the project.

4.15 Different market outlets for smallholder farmers

The majority of smallholder farmers' goal is to produce and sell into markets to generate income profitably and the market is a core link between farmers and consumers. The findings in Figure 4:16 below show that farmers are engaged in different markets, such as hawkers, auctions, agro-processing, retailers and local supermarkets. The outcomes indicate that participant farmers are selling their produce to hawkers (20%), agro-processing (5%), auctions (50%), supermarkets (5%) other forms of markets during selling in farmgate and occasions to the community, such as funerals, weddings and parties with 13%. The majority of smallholder participant farmers are benefitting more during auctions because the FPSUs offer an auction every month as part of the market to livestock farmers, which is a privilege to participant farmers.

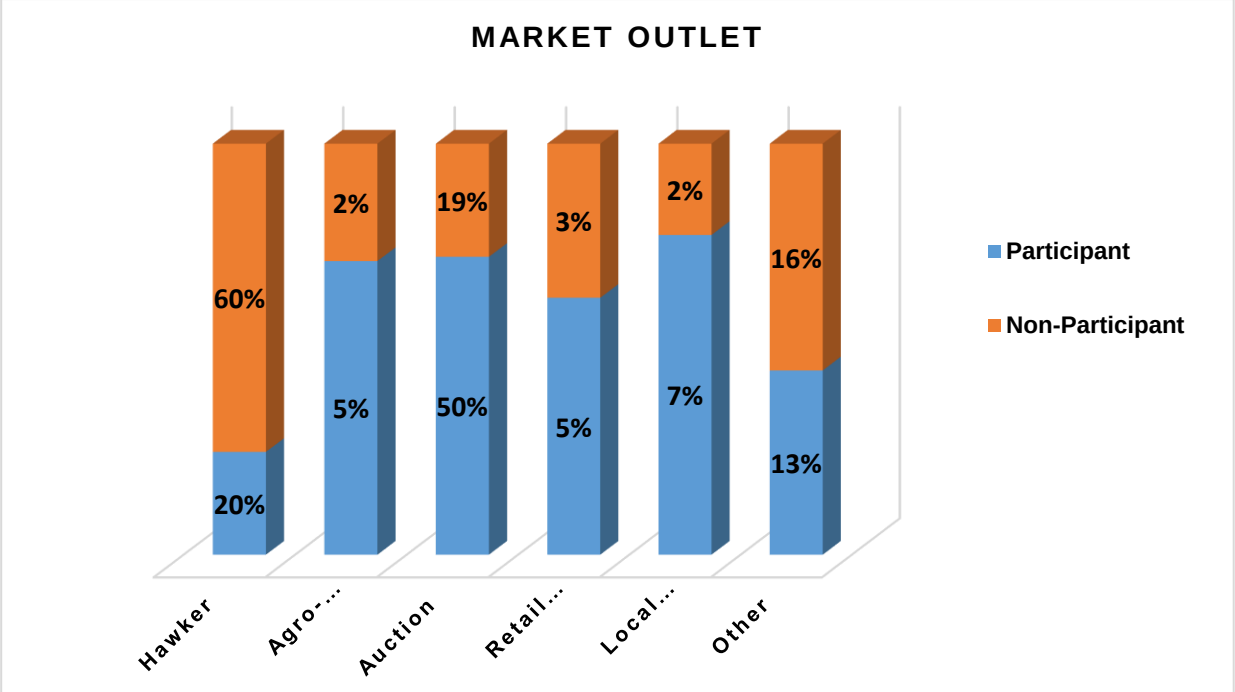

Figure 4.13: Market outlet for smallholder farmers

Source: Results from SPSS (Version 27), generated from Survey, 2021

The results in Figure 4:13 above illustrate that the department must prioritise enough budget for the Agri-Park to be fully functional, hence, there is still a huge gap for smallholder farmers to participate fully and gain income into the market as anticipated by the programme's mandate. According to DRDLR (2015), Agri-Park is the market outreach to all farmers, hence the productivity and income. Furthermore, the majority of non-participants are selling their produce to hawkers (60%). This is so because it is easy to sell to hawkers by many farmers as that market does not require a lot of formal contracts. Non-participant farmers also contribute (2%) to agro-processing, (19%) of non-participant sell livestock at auction, 3% of the non-participant farmers sell their produce to the retailer market. Only 2% are participating in local supermarket supplies, which require a letter of intent agreement and others are selling during occasions in the community, with (16%).

4.16 Access to training by smallholder farmers

Training is associated with learning new techniques, hence improving skills and knowledge. Regarding training, most farmers within the study were mostly trained in agricultural practices and business aspects. The results in Figure 4:14 below show the smallholder farmers' participation in training acquired.

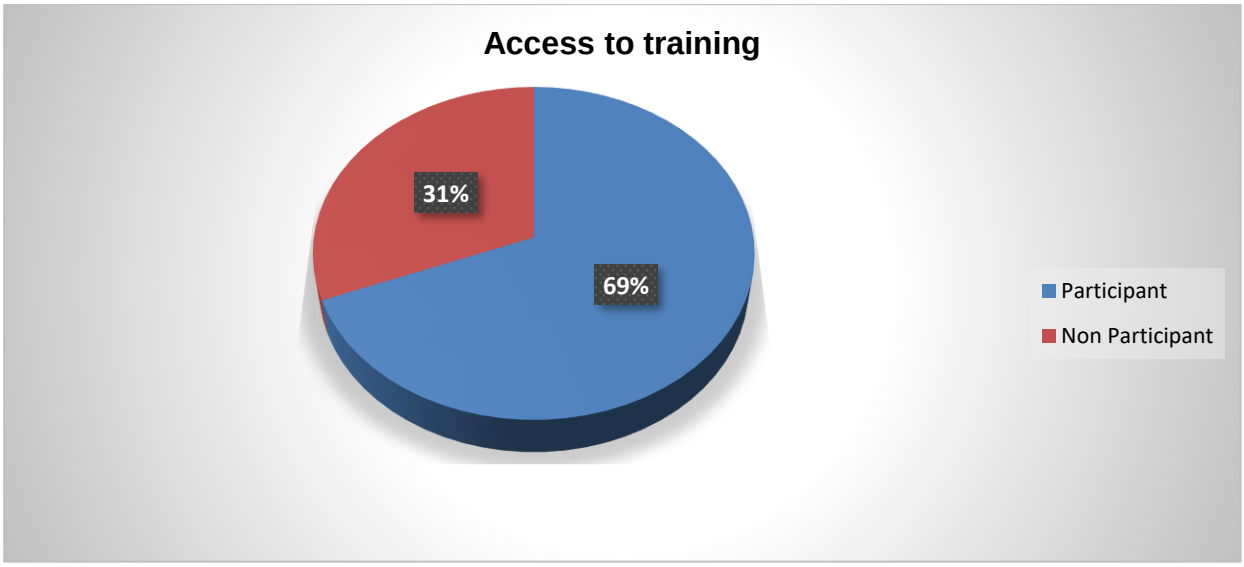

Figure 4.14: Access to Training
Source: Results from SPSS (Version 27), generated from field survey, 2021

Figure 4: 14 above demonstrates that the majority of participant farmers are benefitting from attending various pieces of training offered by the department with (69%), while non-participant farmers exposed to training are at 31%. Therefore the outcome alluded that being a member of the Agri-Park plays a role in receiving the privilege of acquiring training. According to DRDLR (2015), training is one of the mandates and benefits of the Agri-Park programme, where the department and other stakeholders join hands in providing training to farmers as part of skills development to enhance knowledge and skills within the agricultural sector. According to Mmushi (2020), farmers require all the necessary skills to be fully productive on their farms, and a farmer who has certain skills transfer and lacks other related skills cannot guarantee the success of his or her farm.

Therefore, farmers must acquire training on their projects, for better production and knowledge. According to Myeni et al. (2019), the findings suggested that extension services have a crucial role to play in sustainable agricultural productivity through awareness raising, capacity building and the provision of up-to-date information on Sustainable Agricultural Practices, input supply, early warnings on droughts, climate change adaptation strategies, weather forecasts and access to markets and credits. Consequently, it is very crucial to advance the value and involvement of extension services towards enhancing farmers' knowledge and skills. Myeni et al. (2019) suggest that most of the information used by South African smallholder farmers, who are

generally illiterate and lack skills, is through verbal and personal experience. Subsequently, farmers should constantly be trained and exposed to practical work throughout their farming time on field ground. Therefore, Myeni et al., (2019) recommend that future interventions in promoting SAPs should demonstrate the economic, social and environmental benefits of adopting SAPs at the local level.

4.17 Access to Mechanisation by the smallholder farmers

Mechanisation and implements are very important tools for the entire cycle of farming production from land preparation and planting to the harvesting process, therefore this is a very crucial asset to most farmers. According to Bastian et al. (2019), the efficiency of the mechanisation programme can be improved if some of the stated challenges including access to mechanisation centres and the correct type and availability of implements can be addressed. Nevertheless, this challenge can be addressed by the Agri-Park programme, which means there is a need for farmers to participate in the Agri-Park programme. They can benefit from the hiring process of mechanisation to do field work. Figure 4:15 below indicates the accessibility of mechanisation by smallholder farmers in the study.

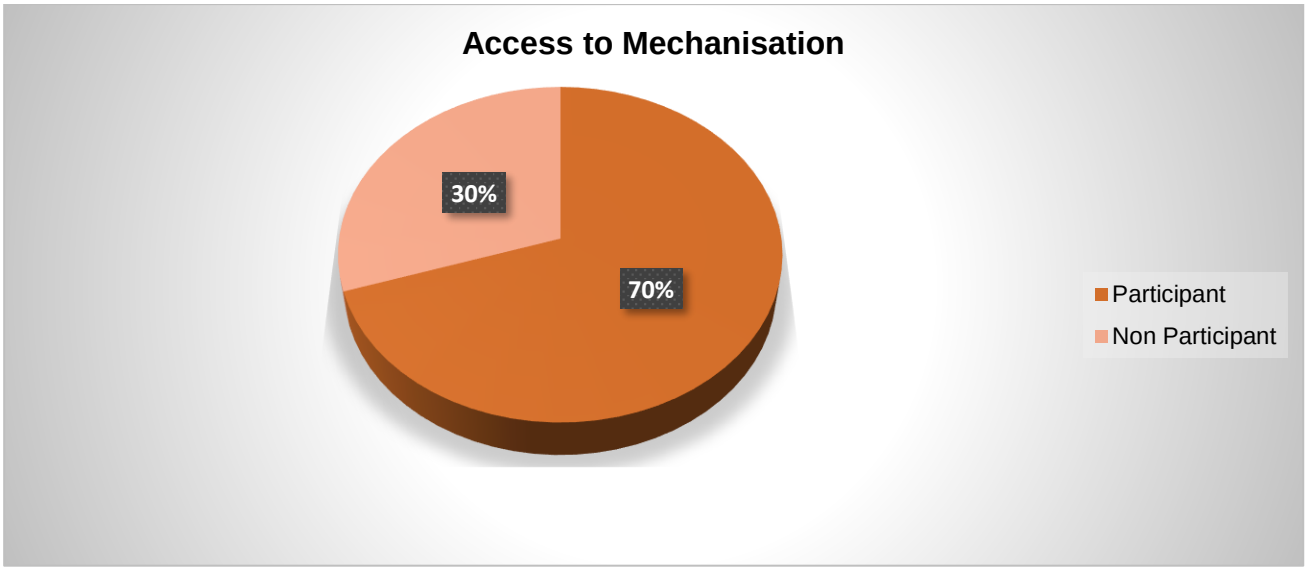

Figure 4.15: Access to Mechanisation
Source: Results from SPSS (Version 27), generated from field survey, 2021

The results from Figure 4:15 above show that smallholder farmers that are participating in the programme have access to the hiring mechanisation with lower rates processes

with 70%, while non-participant farmers have 30% access to mechanisation. The findings illustrate that non-participant farmers struggle to access mechanisation and some of them hire mechanisation from other entities while a participant has the privilege to access mechanisation at a lower rate through the renting process. Limited access and a lack of farming equipment, such as tractors, rippers and planters due to financial constraints often delay and limit the use of appropriate equipment for sustainable crop productivity during the land preparation and planting process (Ntshangase et al., 2018).

Therefore, with the Agri-Park programme, most farmers will be accessing hired mechanisation at lower rates and act as a solution for many farmers who are struggling to procure bigger machinery and appropriate implements for their projects due to limited finances. This is in line with the study by Bastian et al. (2019), who emphasised that the mechanisation programme has had a positive impact on the development of emerging farmers, and they feel that if issues are addressed, the programme could be even more beneficial in ensuring that recipients of the programme reap maximum benefits.

4.18 Access to production inputs by smallholder farmers

The production inputs are the basic needs for creating or producing the outcome, therefore, farmers need to access various production inputs. Figure 4:16 below shows the different inputs that farmers are accessing in order to proceed with the entire farming production cycle.

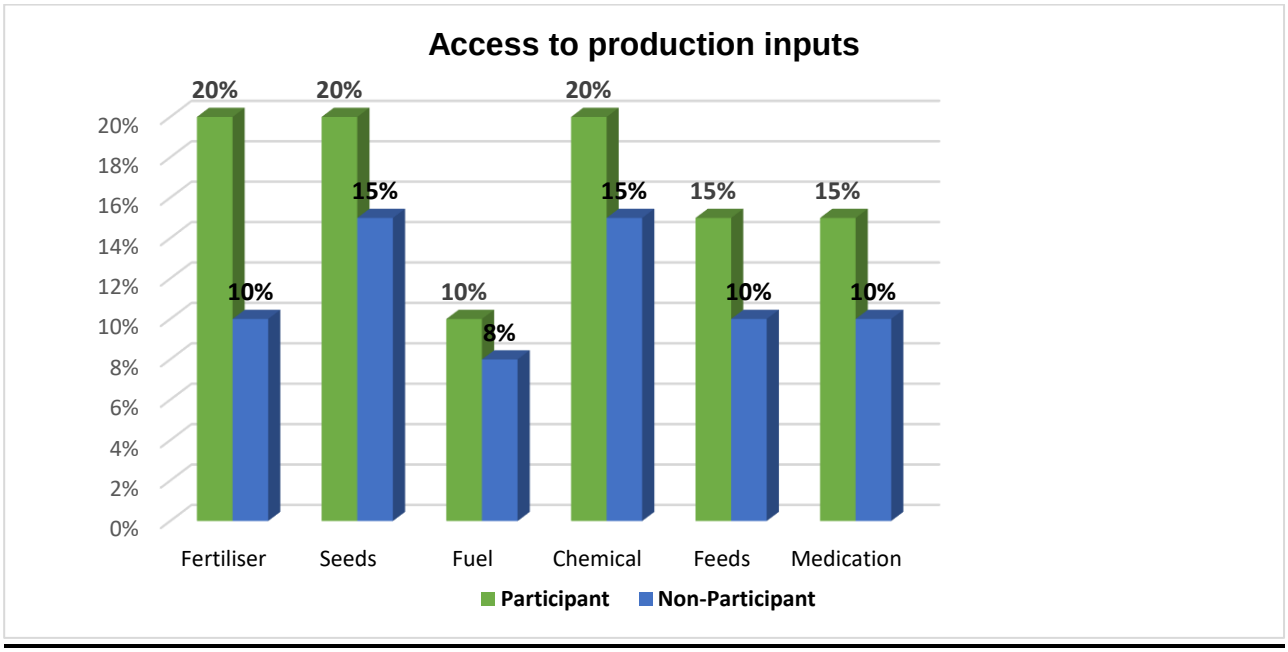

Figure 4.16: Access to Production inputs

Source: Results from SPSS (Version 27), generated from field survey, 2021

From the study area, the most produced commodities are crops and livestock, and it is very important to have access to production inputs, as it increases productivity. The department assists with production inputs, such as fertilisers, seeds, chemicals and fuel whereas, livestock farmers are assisted with feeds and medication. The findings depict that participant farmers are receiving assistance, with 20% of fertilizers, seeds (20%), fuel (10%), chemicals (20%), feeds (15%) and medication (15%). They received all this through the Agri-Park support programme. Non-participant farmers are receiving production inputs assistance, but some farmers are buying those production inputs from various agricultural entities. Most of them complained that it is very difficult to receive production inputs assistance, as they are not members of the programme. The findings also show that non-participant farmers are receiving their production either through buying from stores or assisted by other programmes, besides the Agri-Park programme with (10%) of fertilizers, seeds (15%), fuel (8%), chemicals (15%), feeds (10%), and medication (10%). From the results, it is telling that farmers in the programme are benefitting from the support from the department.

4.3 Assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province

This objective: the implementation approach of Agri-Park interventions towards FPSU and Agri-Hub in the selected areas was assessed using thematic analysis. The findings regarding the thematic analysis were used to produce eleven themes. Each main theme has sub-themes that present the key findings. The figure below provides a thematic map of these themes.

It is very crucial to analyse the entire implementation process for the programme, as it gives more insight into how things were planned and anticipated, as it leads to the progress of the programme. The analytic process for this study was driven by Braun and Clarke's (2006) six phases of thematic analysis (as shown in Figure; 4.17) to identify and describe patterns or themes within the data.

The six phases of thematic analysis

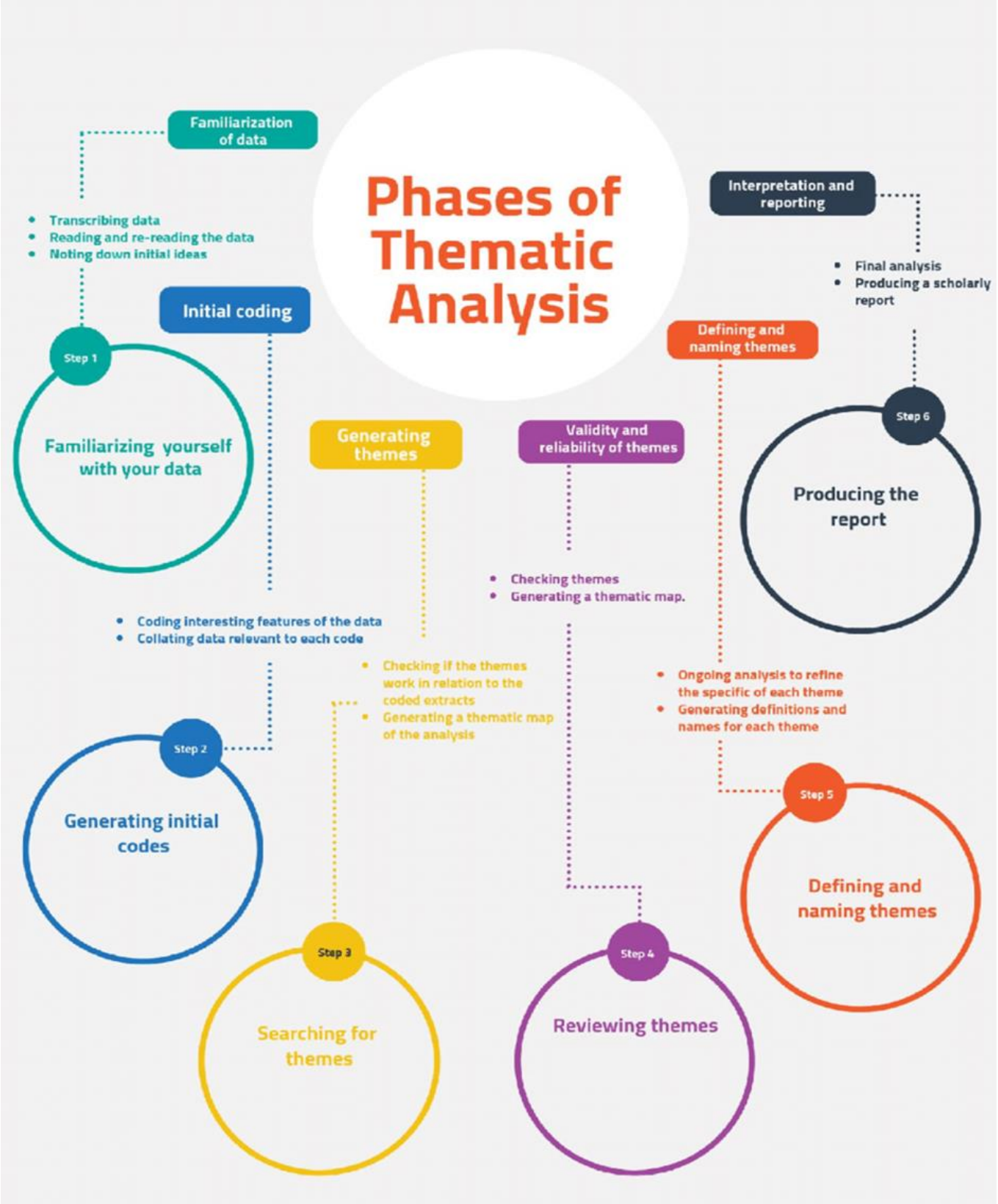

Figure 4.17: Phases of Thematic Analysis
(Adapted from Braun & Clarke, 2006, p87)

The presentation of these themes and sub-themes was supported by the content from the questionnaire of the interviewed department officials who were selected for the study. The aim was to use these themes and sub-themes to find the answer to objective 1, which is: to assess the implementation approach based on the Agri-Park interventions (FPSU and Agri-Hub) in the selected areas of the study. Table 4.3 below showed the final themes generated in the study

Table 4.3: The Final Thematic Map of Main Theme

Themes	Codes	Sub-Themes
1. Mobilisation Process	• Stakeholders involvement • Farmers meeting/Imbizo • Target group and profiling • Awareness or information sharing • Farmer's day and agricultural shows	Conduction process for the mobilisation
2. Infrastructure	• Infrastructure building is not what the business plan entails • Insufficient budget • Invest more budget • Few renovations/infrastructures	Impact of the Infrastructure implementation process
3. Locality	• Suitable to cater for the district • Distance accessibility • Economic aspects • Commodities practised	Site selection of Agri-Parks
4. Sustainability	• Enough budget • Proper planning	Impact of Agri-Parks towards sustainability

Themes	Codes	Sub-Themes
	• Improve implementation process • Amends Standard Operating (SOP) • Management Support (MS)	
5. Productivity & Food Security	• Funds/budget limitation • Minimal Basic Services Support • Low productivity • Low income generation • Government intervention • Fewer farmers benefiting	Impact and challenges of Agri-Parks towards productivity and food security
6. Rural Economy Transformation & Model Ownership	• Ownership not yet transferred • Agri-Parks is not fully functional • Level of production is still low • Low Economic impact • More funds required • Secondary cooperative governs farmers' alliances • Agri-Park is not fully functional	Business model or entities ownership towards rural economy transformation
7. Job creation	• Avail more resources • Increase the capacity for production inputs • Enhancing or promoting productivity • Mentorship/training • Funding youth businesses in agriculture • Tailor youth education and training system	Agri-Parks towards youth employment

Themes	Codes	Sub-Themes
8. Improved Rural Transformation	• Public private partnerships • Avail more resources • Agri-Park components fully functioning • Monitoring & evaluation process • Proper strategic planning • Proper implementation process	Ways for Agri-Parks to improve rural transformation
9. Farmers Production Support Unit & Agri-Hub status	• Storage store production inputs • Agro-processing is still at the planning stage • Market auction • Insufficient budget • Poor planning • Coordination and operational management • Poor implementation process • Insufficient finances • Poor management • Poor information and knowledge • Poor infrastructure development	Functionality of Farmers Production Support Unit
10. Mechanisation	• Fewer mechanisation procured • Progress at an advanced level • More mechanisation required	Progress towards acquisition and procurement of mechanisation
11. Government Funding	• Budget limitation • Agri-Park not operating at a 100% level • Slow progress	Impact of government funding

Table 4.3: Final thematic system map, showing 11 themes generated

(Author: 2022)

Theme 1: Agri-Park mobilisation process

Theme 1: The mobilisation process is very essential when implementing programmes, as it eliminates the risks that arise from poorly defined goals and a lack of communication. Mobilisation should be prioritised, and planned as it plays a huge role in the foundation of the project. Horn et al. (2020) emphasised the importance of dedicating time and resources for community mobilisation and the organisation secures mass buy-in and ownership of the planning process by the community. The study also highlighted the importance of creating institutional and procedural mechanisms that integrate community participation into all stages of the planning processes, allowing for interdisciplinary and multi-sectoral collaboration and upgrading into city-wide strategic planning (Horn et al., 2020).

The respondents in the study attested that during the introduction of the Agri-Park programme, relevant parties were involved, such as stakeholder's involvement (DARD, municipalities and tribal authorities) and the main target are the smallholder farmers, as they are the main beneficiaries of the Agri-Park programme. Mobilisation and engagements were conducted during farmers' day and agricultural shows and are still an ongoing process. The main idea behind the FPSU was the farmers' mobilisation, profiling, participatory planning services, business planning services for rural farmers, rural enterprises or projects and production plans for farmers. Regarding profiling and farmer mobilisation, the purpose of profiling was to lead to more effective policy planning and service delivery.

The mobilisation consisted of gathering information on the living conditions of the various communities and farmers. The information on these deprived farmers and communities allows policymakers and policy implementers to get a better understanding of the dynamics underlying poverty and deprivation. According to DRDLR (2015), the Agri-Parks model required to have a strong social mobilisation component for the organisation, and the mobilisation of black farmers and agri-business entrepreneurs to actively support the initiative. Furthermore, the model should strengthen partnerships between government, the private sector and civil society, while partnering with DAFF and COGTA is essential as well. According to DRDLR (2015), for the successful mobilisation of the programme, the Agri-Parks should:

- Be based on the locational economic and comparative advantages.

- Have all the elements of a value chain (cluster) present for a dominant comparative or product advantage.
- Be able to lay a solid economic foundation for the development of rural industrialization.

To ensure the mobilisation of the Agri-Parks programme, the following 10 guiding principles should be followed:

- One Agri-Park is to be established in each district.
- Agri-Parks should be controlled by the local farmers.
- Agri-Parks are required to be catalysts from which rural industrialisation can take place.
- Agri-Parks must be government-guided to ensure economic sustainability.
- Agri-Parks must strengthen partnerships between the public and private sectors to increase access to services.
- Agri-Parks must maximise the benefit to existing state land with agricultural potential in the provinces, where possible.
- Agri-Parks must maximise access to markets for all farmers with a bias towards emerging farmers and rural communities.
- Agri-Parks must maximise the use of high-value agricultural land.
- Agri-Parks must maximise the use of existing support services and industries.
- Agri-Parks should support growing towns and the revitalisation of rural towns.

The findings in the study areas showed that the mobilisation for the Agri-Park was done, but the information about the programme and its benefits should continue to be disseminated for all stakeholders to understand better the entire programme's implementation process.

Theme 2: Infrastructures

Agricultural infrastructure creates a backbone of the functionality of the farming society and drives economic growth. According to DRDLR (2016), the Agri-Park infrastructure development is based on existing and new business plans, infrastructure assessments, and commodity and market requirements. Furthermore, aspects such as the Agri-Park size, local buildings codes, health, environment, sanitation, transport access, parking

requirements, and common infrastructure facilities, such as abattoirs, feedlots, agri-hub markets, fencing, warehouses, power generation and roads are part of the Agri-Park infrastructural development. According to Mazibuko et al. (2021), infrastructure plays a critical role in assisting smallholder farmers to produce efficiently, thereby improving agricultural income. The respondents shared that most infrastructure of the Agri-Parks are not built accordingly to business plans developed by the department in 2016, since the funding provided was insufficient to develop such buildings mandated by the department-approved business plan.

The biggest factor was capital or investment, which is still insufficient (budget), and there are still preliminary studies that need to be done, such as the environmental impact assessment. The department's infrastructure requirements, which include production zones, processing zones, research and development zones and trade zones must be up to standard so that the farmers can access proper infrastructure and markets. According to DRDLR (2015), the infrastructure requirements are:

- Agri-hub built-up infrastructure (large scale).
- Production zone: livestock facilities such as a holding area and a vegetable greenhouse zone.
- Processing zones: primary processing such as abattoirs, pre-packed fresh processed meat products.
- Research and development zone: research, conferencing and training centres.
- Trade zone: standard design factories, such as packaging, storage and warehousing.
- Famers Production Support Unit (FPSU): small-scale.
- Production, primary processing, trade and social zones and common bulk infrastructure.

Mazibuko et al. (2019) noted that the development of infrastructure is a challenge for smallholder farmers and is not only limited to on-farm infrastructure, but also off-farm infrastructure, such as roads. Poor infrastructure can serve as a barrier to smallholder farmers' access to markets. Smallholder farmers lack accessibility to infrastructures, such as abattoirs, storage and processing facilities and trading facilities as well. The lack of these facilities is a barrier to smallholder farmers' market participation. These services are supposed to be offered through the Agri-Park programme, which is not yet offering such services comprehensively.

The structured business plan has many features to support growth for the farmers. However, presently, there is still a gap for the park to serve its purpose, thus, more funding can only be the solution to the operations of the park. With investment, then, the beneficiaries will have access to improved infrastructure to increase production through the value chain process to the market as well as sharing important market information. In turn, this will support the market, commodity value chain development and expansion in the different components, such as FPSU and Agri-hub within the local municipalities per district.

The findings from the study also depict that the RID within the Department of Agriculture, Land Reform and Rural Development still has a lot of work to deliver and secure enough budget to continue building, and renovating the park so that the building capacity structures are aligned to business plan features and components such as FPSU and Agri-hub. The DALRRD still needs more budget for the physical assessment, environmental assessment and the buildings to meet the standards necessary for the criteria as enshrined in the Agri-Park concept.

The Department of Agriculture, Land Reform and Rural Development should go back to the drawing boards to conduct a national special commodity value chain and market analysis to determine the target sites improvement by identifying gaps, buildings and identifications of high-value commodities, growing productions within the districts or identified Agri-Park sites. According to Adebayo (2018), the use of the agricultural innovation system approach in agricultural development projects was recommended to yield an impact on different facets of the beneficiary's livelihood and the society at large. Therefore, the establishment and implementation of well-organised infrastructure is widely acknowledged as indispensable to agricultural progress (Eke & Effiong, 2016). Mazibuko et al., (2021) emphasise that access to the physical infrastructure in relation to agricultural income is likely to cause a positive and statistically significant increase in agricultural income for both groups of farmers and that there is a relationship between the physical infrastructure availability index and agricultural income for farmers who have the infrastructure. This means it is very important for Agri-Park infrastructures to be designed, and built in a way that attracts positive business, where investors will be attracted and thus will make the park operate to an extent of generating income for target beneficiaries.

Theme 3: Locality

Theme Locality: the findings from the study revealed that the local municipality availed +/- 75 hectares of land for the Agri-hub and +/- 30 hectares for the farmer production support unit. When determining the locality or the site of the park, economic and social aspects were assessed to identify a site that was at the centre of an economic hub and promote a high value chain for commodities and grow production within the area.

Table 4.4: The Norms and Standard for Agri-Parks

Components	Catchment areas in areas of low-density population	Catchment areas in areas of higher density population
FPSU	30 KM	10 KM
Agri-Hub	120 KM	60 KM
RUMC	250 KM	150 KM

Source: DRDLR, 2016

According to DRDLR (2016), the Farmers Production Support Unit is designed to have catchment areas of 30km in low-density areas and 10km in high-density areas, thus indicating that they will be several of them per district. The Agri-Hub is designed to have catchment areas of 120km in low-density areas and 60km in high-density areas, demonstrating fewer AHs than FPSUs. The RUMC is designed to have the largest catchment areas of 250km in low-density areas and 150km in high-density areas. The findings from the study revealed that most FPSUs in the study areas comply with the specification of the department-approved business plan and the first phase was to identify the suitable location and the size of the park per district. Stakeholders such as municipalities and chiefs avail the land to support the programme. The proposed sites were selected according to the economic aspects, where the park would be able to generate benefits for farmers.

The site was also identified with the commodity practised within the area in mind. The findings also depict that the size of the FPSU in Taung under Dr Ruth Segomotsi Mompati is not enough to cater for more farmers and more livestock during the auctions.

Plainly, this is a barrier for rural farmers to access the auction due to limited space, so the limitation minimises the sales and income for farmers. The researcher wished the Taung FPSU would be expanded to fit all the aspects of the park because Taung is very broad and can cater for many farmers as the district is regarded as one of the biggest districts within the North West province.

The Agri-Park location in Ngaka Modiri Molema district was selected based on the economic and commodity analysis and the type of the structures already existing which only required some renovation. The site is accessible, appropriate and can accommodate many businesses. The location of the Agri-Hub in Makweleng and Springbokpan is suitable and accessible for farmers and can accommodate a lot of farmers within Ngaka Modiri Molema. The Agri-hub is central where it can facilitate and administer various projects aimed at capacitating smallholder and emerging farmers. Only adequate funding is required for full operation on the site. The main goal of the park was to cater for the whole district. The Agri-Hub (Springbokpan), which falls under the Ditsobotla municipality was selected for commodity production of maize and sunflower, to mention a few. The project mandates are to provide warehouses (done), silos (done) and a milling plant. A feed milling plant is still ongoing and more money should be invested for the hub to fully start delivering its purposes to farmers who are still facing more challenges with funding for a full operation.

Theme 4: Sustainability

Theme 4: the budget allocated for the Agri-Parks programme is insufficient and the farming community needs to grow their production levels, but they are struggling to break even due to their scale of production, and inadequate support from the government. The findings depict that with the current situation in the financial year 2021-2022, the budget allocated for the Agri-Parks programme is inadequate and the farmers are still not receiving enough support so that they can make income or profit to sustain their businesses. It is recommended that the programme to be sustainable. The government and other stakeholders should work together and support to completion of the entire infrastructure so that it can operate before the year 2025. The park should be operating so that farmers can generate profits. The findings also allude that the Agri-Park cannot sustain itself after the year 2025, without government interventions

because more money is still required for it to operate fully and according to the strategy of the approved business plan structure of the Agri-Park mandates and its components.

The findings from the study revealed that insufficient or a small budget allocation to implement the project, poor proper planning and a lack of commitment to sustaining the project impact negatively the thrust behind the Agri-Parks project. The negative issues are hindering the full operation of all the components of the park. The services that are meant for the farmers include mechanisation, production inputs, training and market access. The Agri-Park programme cannot sustain itself with the current situation because of the pace at which infrastructures are being developed, and seemingly, all the milestones set are not being achieved, unless the government increases its financial support.

According to DRDLR (2015), strategic support will diminish over 10 years and as planned, farmers must take full control. Even though there are some developments in the Agri-Park sites, there is still more budget required to sustain the project so that it operates fully. The budget allocated for the Agri-Parks is insufficient and the farming community needs to grow in terms of production and business levels, but they are struggling to make income due to their scale of production and available funding for support. This finding concurs with the study by Ntlou (2016), who discovered that projects benefitting from land reform (Recap) were still not economically sustainable and had difficulties in accessing markets, which hindered them to low levels of agricultural income even though they received funding support within the programme.

The finding also suggested that the Agri-Park can be sustainable only if more money can be provided to complete the basic infrastructural needs of the park to operate fully within a short period, which is only possible if money can be availed. According to the DRDLR (2015), the government's mandate towards Agri-Park is to support the programme for 10 years, which means they must support the park until it achieves the specified milestones that demonstrate its economic sustainability. Adebayo (2018) recommended that future projects should endeavour to attract and sustain stakeholders' interests in agricultural development projects through loans, credits, grants and other incentives to increase the sustainability level of these projects. This means Agri-Parks should operate in a way that will attract investors so that it improves the economy and income of the beneficiaries.

Theme 5: Productivity and Food Security

Food security is undeniably a severe challenge for the world today and will continue to be so in the future (Chand, 2021). The result of the study showed that there is not enough support for farmers to massify their production. The productivity is still low, so many farmers are still facing constraints in their businesses, such as markets, production inputs, mechanisation, mentorship and agro-processing systems, which are the basic services to increase productivity and enhance food security. The productivity of farmers is still low. Even though the farmers are willing to produce more, without government intervention, the current scenario is unmotivating, and farmers are not making income or profits. The Agri-Park participants are benefitting from the programme and thus increases the productivity of those farmers who received assistance, even though the support is not fully comprehensive. There is still a long way for the Agri-Park to cater for more farmers with production inputs because only a few farmers are benefitting so far, which is not making a huge impact when it comes to increasing productivity.

Only a few projects that have been affiliated with the secondary cooperative, under the Agri-Park umbrella, had been supported with production inputs and pieces of machinery, so productivity was improved, but most non-participant farmers are faced with low productivity challenges. The results are in line with the study by Swinnen and Vos (2021), who alluded that most farmers are concerned that a lack of inputs, plants and labour for the sector will result in low production and that the most pressing fear for most farmers is that they will not have enough food to meet the daily needs of customers, leading to a shrink in their income.

The recommendation is that the Government should allocate more funds and support to farmers to increase production. Therefore, with the current situation within the programme, the farmers are benefitting from the production inputs, such as seeds, fertilizers, chemicals, fuels and pieces of training, which do have an impact on agricultural productivity every financial year. This recommendation is in line with the study by Myeni et al. (2019), which alluded that the government should provide resources and infrastructures to improve the quality and outreach of extension services through field demonstration trials and training. Hence, Sikwela and Mushunje (2013) emphasise that the South African government needs to encourage the establishment of

smallholders' cooperatives and farmer support services for rural farmers, as well as their close interaction with the mentorship programmes to assist these farmers to get out of poverty. In addition, this means Agri-Parks can be a solution for many farmers because it supports collective motive, whereby secondary cooperative as an umbrella is servicing all other affiliated primary cooperatives and individual entities, which promotes support for a collective group.

According to Baiphethi (2009), subsistence/smallholder agriculture can play an important role in reducing the vulnerability of rural and urban food-insecure households, improving livelihoods, and helping to mitigate high food price inflation. Hence it is important to massify the production of farmers and a well-organised Agri-Park programme can guarantee long-term food security. This can be achieved by encouraging farmers to pursue the sustainable intensification of production through the use of improved inputs (Baiphethi, 2009). This is in line with the Agri-Park mandates that the main aim is to provide services closer to farmers so that they can participate in a decent market and improve their lives through acquiring income.

The findings of the study concur with Botreau et al. (2020), who reported that the agri-food system and its contradictions contain several hidden causes of the crisis, structural factors, and these include the liberalisation of agriculture and trade, the concentration of distribution of the inputs, smaller production units and a decrease in investments in agriculture and development assistance to the sector in a context of an increasing climate change.

Theme 6: Rural Economy Transformation and Ownership Model

According to DRDLR (2015) , one of the objectives of the Agri-Park is to transform and modernise the rural areas and small towns per district within the local established municipality through the development of the agricultural sector over 10 years (2015-2025). The respondents emphasised that if the government can provide more funds to finalise all the infrastructure development, the mechanisation hiring process at low rates, expand the auction level as a market and fully function the entire system of the Agri-Park programme, then, farmers will be independent and start running the entire process, so the only solution is an adequate budget. Currently, the level of production is still low, which does affect the economic impact at the level of primary production.

According to DRDLR (2015), Agri-Parks are to be 70% owned by producers, with the state and commercial interests holding minority shares (30%). In terms of the 70/30 split, only producers who are willing to participate as cooperatives and willing to trade with the Agri-Park legal entities will form part of the 70%. The state's 30% minority sharing is meant to leverage private sector support. Viable partnership models may be considered if smallholder farmers are the majority stakeholders. So far, farmers have formed a structure, which is the secondary cooperative that is governing or representing the body or alliance for farmers. The secondary cooperative is made of the primary cooperative that has affiliated with the secondary cooperative. The request for funds and ownership will be the secondary cooperative, working with the department officials. After the full completion of the park or in future when the park is operating fully, then, 70% ownership will need to be controlled by farmers in form of a secondary cooperative, which represents the voice for farmers in all districts.

Currently, the Agri-Park has not yet transformed the rural economy and transferred ownership to farmers. Most farmers are still suffering, and the Agri-Park is not doing enough to support farmers to increase productivity. The farmer's assisted are few and productivity is still truncated. It will take time for the park to transfer full ownership to farmers, with an equity of 70%. The ownership of the Agri-Park is supposed to be transferred to farmers as a handover in 2025, from its inception in 2015 and most respondents from the study argued that it seems impossible for sustainability if things will remain the same, without change in terms of more resource allocation. According to Mabhaudhi et al. (2019), the Water Energy Food (WEF) nexus is a decision support tool that improves rural livelihoods through integrated resource distribution, planning and management, and this ensures inclusive socio-economic transformation and development, and addresses related sustainable development goals, particularly goals 2, 3, 6 and 7.This is in line with the Agri-Park mandate, which is to support farmers to improve most rural livelihoods through providing basic needs and services to ensure sustainability and economic growth.

Public-private partnerships should be in place to assist the government in its efforts to improve the economy and proper planning should ensure that Agri-Parks and their components are implemented as per the master business plans. The government should do proper planning so that the implementation process will not fail, so officials on the ground who work directly with farmers must be involved during strategic planning

as they know more about the farmers' needs better than top managers, and doing so will avoid more failure. More funds are required, thus the government should prioritise partnerships with the private sector and other stakeholders so that enough budget can be planned and availed to do the work. The officials should properly follow Standard Operating Procedures (SOP), so that all the plans and goals of the project will be implemented in the right way and then support farmers. Farmers are still facing more challenges in their projects, so through this initiative, the rural economy will be transformed.

Theme 7: Job Creation

One of the objectives of the Agri-Park is to create more agricultural job opportunities and the objective is aligned with chapter 6 of the National Development Plan (NDP, 2012) of an inclusive rural economy, which aims to contribute to a target of one million jobs in the agricultural sector through creating higher demand for raw agricultural produce and production inputs, hence improving the economic activities in the sector. Agri-Park can create more jobs and more land turned to full production if the Agri-Park programme can operate fully with its components, such as FPSU and the Agri-hub. The respondents in the study indicated that if only more resources are made available to support farmers with their daily challenges, such as funding, markets, mechanisation, production inputs, skills development and mentoring available farmers, then, farmers will work efficiently and generate income.

According to Garidzirai et al. (2019), the main economic base sectors, such as agriculture and manufacturing, unexpectedly had little of a positive impact on the local economy, hence it is very crucial to prioritise more funding for agricultural projects so that more local jobs can be created. The respondents suggested that, if more farmers are doing well in their projects, then, income will be generated and farmers can hire workers. The respondents' views on the study agreed with the study by Mwale et al. (2021), who indicated that effective project management and control and improved support from a partnership with the local community stakeholders are the factors that, if targeted first, could address most challenges faced with rural agrarian reforms. Therefore, if the budget is allocated fully, then, more resources such as capital, infrastructure development, machinery and training are made available to farmers in

form of support. Jobs will be created due to higher productivity, but with the situation of Agri-Park status in 2022, the level of slow implementation and operation processes, farmers cannot create more jobs because of a lack of adequate farming resources for their projects.

The study suggested that partnership with the private sector can help farmers commercialise and move swiftly towards agro-processing. Identified threats and successes must be prioritised in designing and formulating region-specific rural agrarian support programmes for communal farmers (Mwale et al., 2021). According to Mkhize, (2019), the sectors within the tertiary sector are the best performing sectors in terms of employment intensity of output growth, reflecting the changing structure of the economy and the nature of employment shifting away from primary towards the tertiary sector. Consequently, to increase youth participation in agriculture and rural development, there is a need to group more rural youth to support services, local employment programmes and youth inclusion in policy formulation processes. Additionally, the focus of policy and programmes should be broadened to cater for different youth knowledge and skill profiles. In addition, this means Agri-Park can engage more youth so that youth participation can increase. Youth mindset and energy are much needed in the agricultural sector. This is in line with a study by Geza (2022), who indicated that investments have had different levels of achievement, but silently, what is nerve-wracking is the high youth unemployment rate, which is among the highest worldwide.

Theme 8: Farmer Production Support Units & Agri-Hub status

The lack of coordination and an integrated package in the agriculture sector has led to the Agri-Parks initiative (DRDLR, 2015). The concept follows an integrated Agri-Parks approach of collective farming efforts, farmer incubation programmes, Agri-clusters and eco-villages while also contributing to land conservation and preservation. According to Nogales (2010), agro-based clusters, known as concentration of producers or agri-businesses, institutions that are engaged in the same agricultural and agro-subsector interconnect and build value networks when addressing common challenges and pursuing common opportunities. This cluster model is similar to the South African Agri-Park model. Therefore, the initiative is similar to that of a traditional agricultural business

park or hub model, where multiple tenants and owners operate under a common management structure and where a range of enterprises can exist (DRDLR, 2015).

According to Sharma (2014), suggested farmers and small and medium agro-enterprises can benefit from participation in agro-based clusters as well. Developed concentration of related agribusiness spurs increased productivity through specialised inputs, access to information, synergies and access to public goods and more rapid innovation through cooperative research and competitive striving. The findings from the study concur with the FPSU and Agri-Hub mandates that can be achieved if funding, collaboration, management and good implementation can be prioritised in the selected areas, and more yield results can emerge. The FPSU in Dr Ruth Segomotsi Mompati does the primary collection and markets (auctions). For example, the Taung FPSU in Greater Taung local municipality does the livestock auction activities on monthly basis, where the two auctioneering companies are contracted to conduct such an auction facility at the FPSU site. Various types of livestock auctioned are mainly cattle, goats and sheep, where farmers are gaining income for their projects. The storage is available where production inputs are stored so that they can be distributed per project and pieces of mechanisation procured are being hired at lower rates towards the beneficiaries. The FPSU in Taung hosts auctions every month and thus acts as a market for farmers to generate sales and income.

There are districts such as DR RSM, and Ngaka Modiri Molema that have the infrastructure to store the production inputs, but not everything is complete or there is a huge room for improvement in the park so that everything will then run smoothly. In Mooifontein, Springbokpan site, renovation and development of structures were done and storage to store production inputs, but the processing is still at a low stage. Many of these FPSUs are functioning, albeit at limited capacity and with minimal support and infrastructure development. However, in terms of FPSU, the development of infrastructures is at an advanced level. Most infrastructure is used to store the production inputs and some auctions are hosted as markets, but the processing is still at a forecast and initial stages, particularly in Ngaka Modiri Molema district in Mooifontein and Springbokpan, the site is operating.

According to DRDLR (2015) and CSIR (2016), the Agri-Hub is a production, equipment hiring, processing, packaging, logistics, innovation and training facility. According to the respondent's views, land has been allocated for the development of Agri-hubs within the identified and selected areas, but most respondents emphasised that more land available should be further expanded for growth and to cater to more farmers. There is not much progress that has been achieved in terms of Agri-hubs, except for fencing in some areas and little infrastructure development compared to the FPSU, which is at an advanced level and some auctions are taking place per month and thus assist farmers to generate income (market).

The progress for the Agri-hub has been poor and slow. In the DR RSM district (Vryburg Agri-hub), there is not much progress that has been achieved for only fencing has been installed as part of infrastructural development. In Ngaka Modiri Molema, the site for the park, Springbokpan, has been renovated and infrastructural development was implemented, Thus, the hub is at an advanced stage. So much investment was done, and just the site is not operating other components.

The progress in terms of FPSU and Agri-hubs interventions is going well, but at a slow pace as was anticipated because there was a timeframe allocated for each milestone of the project. Compared to other provinces, such as Free-State, Gauteng, KwaZulu Natal and Mpumalanga, the programme's progress in the North West province is still low. Andriushchenko et al. (2020) shared that for a programme like Agri-Park, which is similar to an Agro-based cluster, analytical procedures and organisational measures are the formation of the management mechanism that ensures effective interaction between members and the achievement of the programme's development goals. The study also indicated that key phases for determining the commencement, and creation of the programme aspects, such as infrastructure development, financial sustainability, investment attractiveness, quality and available resources will increase the concentration of the agricultural production, productivity, as well the programme's sustainability (Andriushchenko et al., 2020). To ensure better effectiveness of future related projects, beneficiaries and staff recommended timely necessary support, discouragement of politics, quality extension support, support in identifying appropriate markets, full participation of the youth and the possible subsidising of the agricultural inputs (Adebayo, 2018). Participation in a farmer group facilitates farmers obtaining farm-related information. A farmer group also acts as a channel of distribution for

government support, such as farm subsidies, farm machinery and training programmes (Rondhi et al., 2018).

Theme 9: Mechanisation

The most common issue that smallholder farmers encountered is the difficulties to acquire farm equipment (Muzangwa et al., 2017). This issue of the lack of mechanisation and farm equipment led to the concept of the Agri-Park strategy adopted. One of the objectives of Agri-Park is to support farmers with mechanisation in order to enhance their productivity and income in their different projects. The respondents indicated that farmers are struggling to acquire or purchase tractors and some farm implements due to not acquiring loans from private institutions, such as banks. Thus, the Agri-Park components, such as hiring mechanisation with low rates can be a solution for many struggling farmers. The findings are aligned with the study by Daum (2017), who echoes that farmers and owners of tractors reported that the application for a loan from a private bank is tedious and that the repayment schedule is stringent and not adapted to the characteristics of farming. This is in line with why Agri-Parks were initiated because most farmers are struggling to acquire financial assistance, especially from formal institutions, such as commercial banks, and studies by Sifundza (2019) and Maziya (2019) concurred with the matter of farmers having difficulties in accessing credit from formal institutions.

The mechanisation system for the Agri-Park is through the hiring process, where the department and the management of the secondary cooperative committee are working together to facilitate the process and delivery services to the farmers within the radius of the located FPSU or Agri-Hub. The FPSUs within the selected areas were supported with fewer mechanisation and implements for the benefit of the farmers affiliated with the programme. The respondents emphasised that the progress in the mechanisation hiring process is very slow. There is some mechanisation that has been acquired in support of farmers, such as combine harvesters, tractors, rakes and trailers amongst others and some projects have been supported with the production inputs to enhance productivity. Ntshangase et al. (2018) revealed that the lack of access to farming equipment, such as tractors, rippers, and planters is due to financial constraints. Poor land preparation and a shoddy planting process affect productivity.

The findings from the study allude that there is still a need for more money to procure enough mechanisation to support more farmers within the FPSU. Hence, for the market to operate and assist farmers to generate income, more support must be done so that mechanisation can be able to cater for more farmers. The findings are consistent with the study by Daum (2017), which alludes that market failure in agricultural finance was identified as a major constraint to mechanisation that affects both investments in tractors and the financing of tractor services. Therefore, it was recommended that governments should focus on the entire Agricultural Innovation System to make mechanisation sustainable from an economic, social and environmental perspective (Daum, 2017). This recommendation from the study of Daum (2017) agrees with the need for the Agri-Park programme to support the struggling farmers with the hiring process of mechanisation with lower rates as it is a burden for the farmers to buy expensive mechanisation as part of a long-term asset. The Agri-Park mandate about ownership of machinery after sustainability is that Government will constitute 30% and 70% for farmers to run the programme after 10 years of support. This is in line with the results by Sarkar (2020), who suggest that ownership of machinery is also significantly influenced by the factors, such as the size of landholding, access to irrigation and institutional credit. Hence, the way the Agri-Park mechanisation funding and ownership of machinery transferred to farmers is still an issue due to the slow pace of the programme, therefore it delays the profitability of farming.

Theme 10: Government Funding

The government funding is very limited and it cannot cater to most needs of farmers to be supported fully and satisfied. Briones (2013) emphasised that agriculture continues to exhibit a disappointing performance namely through laggard growth, a lack of diversification and competitiveness, tepid productivity growth and persistent poverty among farmers. Therefore, this means that a lack of government funding affects the progress of the programmes designed and suitable to yield positive results. According to DRDLR (2015), it was noted that the Agri-Park policy intends that both internal DRDLR programmes, external programmes and structures shall provide the necessary funding for prioritising the full operations of the Agri-Park. Therefore, it seems the funds were insufficient and other external stakeholders are not contributing to the programme, thus hindering productivity.

The most disadvantaged black farmers lack farm equipment and this is caused by financial limitations frequently interrupt proper maintainable crop productivity (Muzangwa et al., 2017; Ntshangase et al., 2018). The Programme Agri-Park is a great concept program that aimed to support farmers with basic needs such as production inputs, mechanization, extension services, training and market support, however, there is always an issue with limited Government funding, which minimized the great results of the Programme. Aliber (2012) disclosed that the government tries to support smallholder farmers though this has been costly and ineffective due to limited funding. This means Agri-Parks are facing challenges of inadequate support, This is in line with the study by Durlak (2013), who alluded that poorly implemented programmes can mislead decision-makers into assuming that the programme is ineffective and if well implemented, it can work very well.

The respondents depict that the programme concept and mandates are good, but the problems are the implementation and the funding processes and to some extent, there is political interference and biased funding of farmers, which affects the viability of the whole programme. The respondents also emphasised that the programme objectives towards inclusive economic development towards uplifting rural farmers are very feasible on paper, but the implementation processes, starting from infrastructure development (building and renovations) and a low budget affect the purpose and plans for the Agri-park. The viability of the programme moving forward will require more support in terms of funds and a strong management team needs to rectify issues and improve the support delivered by the department.

The respondents from the study were concerned with the current potential of the Agri-parks, and they recommended that only resources should be availed for the progress to be realised (planning, budgets and commitment). According to Briones (2013), public goods that show evidence of impact on agricultural incomes and productivity are infrastructures, such as roads, ports, electrification (under other infrastructure), regulatory services, and research and development for technological change and agricultural modernisation. The government needs to inject more funds and ensure that the timeframe is executed, as anticipated with the stipulated mandates of every programme. Adebayo (2018) suggested that future projects should attempt to attract and sustain stakeholders' interest in agricultural development projects through grants and other incentives so as to increase the sustainability level of these projects. In

addition, this means Agri-Parks should properly work and deliver services to farmers as this can be only achieved if the government can increase and inject more finances to make the park more functional, attractive, competitive and promote sustainability.

Theme 11: Challenges of the implementation process

Implementation refers to efforts designed to get evidence-based programmes or practices of known dimensions into use via effective change strategies (Damshroder & Hagedorn, 2011). The implementation of Agri-Park started in 2016 when the business plans approved by the department were in place, but the implementation process was slow and in 2019 in the North West Province, the process was starting to be seen progressively. The respondents outlined the challenges of implementation of the Agri-Park programme in the North West Province as follows:

- Poor planning
- Low budget/funds allocation
- poor coordination, monitoring from the upper management who approved funds,
- poor and slow infrastructural development (the infrastructures were not built according to the approved business plan)
- Support is still insufficient, not catering for more farmers with basic services
- Provincial team not doing enough for the implementation processes; there is still a need for training for the department officials to enhance their knowledge and better understanding.

The outcome of the study concurred with these findings by Durlak (2016) , that Agri-park is very significant in supporting farmers with farming needs, and the programme is considered the flagship for the DRDLR, but the budget made available every financial year to implement these projects is very limited. The funds are insufficient to achieve the desired impact, as anticipated within the time allocated, so if more funding is availed, then the entire programme will move in the right direction to make a great change.

The planning procedures must be done provincially with the engagement of officials who do groundwork, and the goal to ensure that farmers get more support in terms of production inputs, mechanisation and market should be prioritised. with the current

situation in 2022, only fewer farmers affiliated with secondary cooperatives are benefitting, whereas many farmers are not part of the programme. The government should provide subsidies for cost reduction towards farmers' expenditures in terms of the Agri-park programme. Therefore, there is a need for planning, monitoring and evaluation processes to ensure the effectiveness of all the assessments to improve the park's functionality and avoid delays in transforming the park. The respondents emphasised that the government should make the park fully operational by investing more funds so that rural enterprises and rural industries, such FPSU and Agri-hub, can facilitate the efficient movement of rural produce to reach markets, as most rural farmers are still facing market challenges. This challenge hinders them from having reliable income and doing well in their business. It is very significant that Agri-Parks can be improved, as they are the cornerstones of the rural economic transformation, to provide the community with jobs, food security and more opportunities for private investors to invest in the park mandates.

Additionally, the private sectors should play a part in the design, development ,financing and ensure the operationalization of the Agri-Parks .There is a challenge of fully involvement of key private sector actors including commodity groups, private cooperatives, organized agriculture, Agricultural Business Chamber of South Africa (Agri-Biz) and existing markets to support Agri-parks and these has a negative impact towards the programme to delivered what was intended. Input and support from these private sector stakeholders shall prove essential for strengthening and enhancing the Agri-park specific commodity value-chains. This multi-stakeholder approach shall ensure that the needs and interests of the many actors involved, including producers, consumers, Government and investors are addressed, and that holistic support and inclusive participation bolsters the performance of Agri-Park

4.3: EMPIRICAL RESULTS

4.3.1 The Socio-economic factors affecting smallholder farmers' participation in the Agri-Park programme.

As specified in the methodology section, the Binary Probit model was used to analyse objective 2 : the socio-economic factors affecting smallholder farmers and whether or not to participate in the Agri-Park programme. The Binary Probit regression model was used to analyse the dataset obtained from 128 smallholder farmers, and the output observation was analysed using the SPSS software. In Table 4.5, the results of the Omnibus tests of the model coefficients indicated that the Chi-squared test was a statistic of 142.68, with the degree of freedom (23) associated with a probability (P-Value) of less than 0,001, which showed that the model fits significantly better than an empty model with no predictors. Indicating that the overall effect of the variables estimated was statistically significant towards the effect on smallholder farmers' participation in the Agri-Park programme.

The results from the model summary estimated the likelihood ratio test (the variance residual -2log likelihood) of (34.649). The output of the result showed that the iteration log was indicating how quickly the model converged the log likelihood (34.649) was used. The Cox & Snell R^2 is 67%, and the Nagelkerke R^2 is 89%. The overall accuracy or percentage of correct prediction of the model was 96%. The Hosmer and Lemeshow test result was insignificant, with 0.350, which indicates that the model fits well. The table below represents the values for the coefficients, standard errors, z-statistics, and associated P-value. The variables in the models are the explanatory variables estimated in the model and were found to be statistically significant at 1 %, 5% and 10% significance levels.

Table 4.5: Socio-economic factors affecting farmers to participate in the Agri-park mandate in the North West province.

Variables	Coefficient (B)	Standard Error (S.E.)	Wald (z)	Probability (P>|z|)
$x1$ = Gender	2.178	0.316	2.023	0.066*
$x2$ = Age	0,0240	0.101	5.647	0.017**
$x3$ = Marital Status	2.819	2.194	1.651	0.198
$x4$ = Educational Level	-10.162	5.016	-4.104	0.043**
$x5$ =Employment Status	2.324	3.698	0.014	0.280
$x6$ = Household Size	-0.032	0.397	0.007	0.935
$x7$ = Access to Transport	2.168	1.151	0.162	0.687
$x8$ = Access to Training	13.158	6.091	3.251	0.002***
$x9$ = Access to Market	-12.642	6.357	3.955	0.047**
$x10$ = Access to Marketing Information	-1.363	3.634	0.006	0.574
$x11$ = Access to Credit	0.273	2.292	1.166	0.905
$x12$ = Off Farm Income	-0.143	2.303	1.687	0.679
$x13$ = Farming Experience	0.286	0.178	2.602	0.107 *
$x14$ = Ha Produced	-1.766	0.658	2.510	0.120*
$x15$ = Specialised Commodity	0.007	0.003	5.213	0.022**
$x16$ = Distance to Agri-Park	-0,119	0.060	3.948	0.047**
Regression Information: Binary Probit Regression Dependent Variable: Agri-Park Participation (Yes=1 & No =0) Number of observations = 128 LR chi2(13) = 142.67 Prob > chi2 = 0.000 -2 Log likelihood = 34.67 Pseudo R2 = 67% R2 = 89% Overall correctly predicted = 96% Note: * p < 0.1; ** p < 0.05; *** p < 0.01				

Source: Results from SPSS (Version 27), generated from Survey, 2021

The results in Table 4.5 above showed the coefficients, standard errors, the Z-statistics and the associated p-value. All the variables notably gender, age, education level, access to training, market access, farming experience, hectares produced, specialised

commodity and distance to Agri-Park are statistically significant. The significant variables are explaining socio-economic factors affecting smallholder farmers whether or not to participate in the Agri-Park programme. Probit regression coefficients give the change in Z-score or Probit index for a one-unit change in the predictor. Variables of gender, farming experience, and hectares produced were statistically significant at 10% and the variables: Age, level of education, specialised commodity and distance to Agri-park were statistically significant at 5% level, while access to training was statistically significant at 1% level.

This indicates that variables: gender, age, education level, access to training, market access, farming experience, hectares produced, specialised commodity and distance to Agri-Park had the greatest influence in determining the farmers' participation in the Agri-Park programme. All the independent variable coefficients possessed the hypothesised direction of influence on the dependent variable. Furthermore, other variables, such as marital status, employment status, household size, access to transport, access to marketing information, access to credit and off-farm income were not significant in explaining the smallholder farmers' participation in the Agri-Park programme.

The results in Table 4.5 also showed that the variable, gender of the farmer in participation in the Agri-Park Programme, has a statistically significant positive relationship. The coefficient for gender is +2.178, which is statistically significant at the 10% level (p= 0.066) and thus implies that a male farmer is more likely to participate in the Agri-Park programme compared to a female farmer. The finding is in line with prior expectations. This may be because males can access land more easily compared to females, hence they are more active in agricultural activities. In general, female farmers tend to be more risk-averse than males. This means that the probability of female farmers engaging in the programme agreements is reduced compared to male farmers.

The findings concur with the study by Nkonki-Mandleni et al. (2022) and Niehof (2004), who emphasised that the higher percentage of male-headed farming households can be attributed to the stereotyped nature of homeland agriculture in Africa, whereby males are expected to dominate farming activities, whereas females dominate other income-generating activities, such as food processing and trading to increase family income. This is consistent with the fact that agriculture in Africa is characterised by the use of crude and highly labour intensive (encouraging drudgery) implements, which is

detrimental to the health status of the users. In the long run, this discourages women's participation in some farming activities, such as land clearing, weeding, and ridging (Aliber & Hart, 2009).

The results also revealed that gender in the study had a significant effect on agricultural productivity as more males participated in the programme, meaning they achieve higher productivity than their female counterparts. The result is in line with the findings of Atakli and Agbenyo (2020) who stated that females in the African narrative have extra domestic activities, especially in the rural areas, as compared to their male counterparts, hence managing domestic activities coupled with farming becomes complicated and could affect their productivity.

The variable, farmers' age, has a statistically significant positive effect and is significant at 5% level (p= 0.017) on smallholder farmers' participation in Agri-Park. This indicates that the older the farmer, the higher the chances that they engaged more in agricultural farming. The coefficient for age is +0.0240, which implies that a one-year increase in the farmer's age increases the probability that the farmer participates in the Agri-Park programme. The probability to participate in the programme increased by 24% for every additional year added to the age of the farmer. The positive effect of age on the programme was expected. It can be inferred from the result that older smallholder farmers were more participating in farming than younger smallholder farmers and it might be due to older farmers being more likely to farm due to family traditional background and inheritance. It contradicts the findings by Brown et al. (2019) who concluded that age is correlated with farmers' values: older farmers are more risk averse, less willing to experiment, less likely to adopt new technologies, and less likely to be influenced by social expectations, and more focused on financial performance.

The findings also contradict the findings by Musara et al. (2011), who concluded that younger farmers are more expected to engage in contracts, since they are innovative and willing to try new ideas, compared to their older counterparts who are more risk-averse and tend to avoid the risks that come with the initiative. The study encourages younger individuals to become more active in the farming community, as it is a positive step towards accelerating the adoption of management practices with environmental benefits (Brown et al., 2019). The programme needs to focus more on young farmers

who are less risk averse, more influenced to adapt to new programmes and yield positive results in their projects.

The level of education achieved by the smallholder farmers was statistically significant at 5% level (p= 0.043). A unit increase in the level of education significantly decreases the likelihood of smallholder farmers participating in farming by -10.162. This means that a higher level of education is associated with a decrease in the probability of participating in agricultural farming by most rural black farmers. This indicates that most educated farmers are not participating in the programme, which means that they are owning their farms, and have access to credits and production inputs in their capacity, without government intervention, especially as the government assists farmers in form of a group, as a primary or secondary cooperative. Atakli and Agbenyo (2020) emphasised that farmers that have acquired education have more influence on agricultural productivity, hence, it is very vital for farmers to acquire education to enhance their knowledge. The results further confirm that attaining higher education levels predisposes individuals to better farming experience and awareness of the benefits. It also fosters a willingness to undergo training and acquire new knowledge about climate variability and change (Kom et al. 2022).

The variable, training, was found strongly statistically significant at 1% level (p= 0.002) and has a positive effect on participation in the Agri-Park programme. The coefficient for training is +13.158, implying that a smallholder farmer who has received training services within the programme is more likely to increase productivity than a farmer who is not participating because training is one of the benefits that the programme offers to enhance knowledge and skills for farmers towards their farming businesses. This is in line with prior expectations. This outcome concurs with the findings by Sifundza (2019) who concludes that training provides farmers with the latest information, latest technology and crop varieties that would increase their productivity. The smallholder farmers that participate in the Agri-Park Programme are supported or offered training, such as business management, crop production, animal production, and governance and marketing, as part of the cooperative and enterprise development mandate to enhance skills development for most disadvantaged rural black farmers.

The above result concurs with the objective of the Agri-Park Programme, which is to support smallholder farmers by providing capacity-building, mentorship and extension

services to transform the agriculture industry (DRDLR, 2015). According to Mazibuko et al., (2021) access to extension services, training and technical support services might contribute to farmers enlarging their production tasks, thus contributing to an increase in farm income. Mabuza (2016) attributed that extension services play a vital role in capacity building to organise farmers to adopt new technology and increase their production efficiency. The results also concur with the findings by Wordafa et al. (2017) who concluded that farmers' training centres have a positive significant impact on regular returns annual farm income by participants on training and more support to strengthen their production.

The variable, market access, has a statistically significant negative way to influence on the farmers' participation in the Agri-Park programme. This means that a farmer who has access to a stable market for his produce is less likely to engage in the Agri-Park umbrella that is governed by the secondary cooperatives within the district in a specific local municipality. The negative relationship between access to the market and Agri-Park participation is more inconsistent with prior expectations. The Coefficient -12.642 for market access is statistically significant at 5% level (p= 0.047) and implies that a farmer with access to a guaranteed market is 47 % times less likely to engage in a secondary cooperative that services all the primary entities affiliated with the Agri-Park than a farmer who has no market access. One of the reasons farmers engage in contracts is to have a guaranteed market for their produce once it is ready for harvesting. If the farmer already has a market for his produce, he would see no need to participate in contractual agreements that are shared with many farmers (Sifundza, 2019).

The variable, farm experience, was found to be statistically significant at 10% significant level (p= 0.107) and the relationship between farming experience and participation in Agri-Park was found to be positive. The positive relationship indicates that a unit increase in farm experience significantly increases the likelihood of participation in farming by 29%. The outcome depicts that smallholder farmers with more experience in farming have a higher probability to participate in the programme, as compared to farmers with low experience. These results also concur with the study by Obasi et al. (2013), who confirm that the experience of a farmer is associated with higher production levels. Furthermore, the number of years a farmer has spent cultivating crops on a farm is considered his/her agricultural experience (Kom et al., 2022). This is in line with the criteria for selecting the Agri-Park beneficiaries, thus meaning the number of years a

farmer accumulated is associated with more experience and advantage to participating in the programme. Adégnandjou and Barjolle (2018) concluded that farming experience helps with the easy implementation of any adaptation techniques, hence this agrees with the Agri-Park programme, where participant farmers are offered training to enhance their knowledge and experiences and make it easy to relate and adopt new techniques.

The variable size of land hectares produced has a negative coefficient of -1.766, which means that an increase in the predictor leads to a decrease in the predicted probability. The variable land hectares size harms the participation of Agri-Park and it is statistically significant at 10% level (p= 0.120). This outcome suggests that farmers with a small piece of land to produce are likely not to participate in the programme, compared to smallholder farmers that have larger pieces of land to produce for the market. The results concur with Odunze et al. (2015), who found that large-scale farming had more likely to increase the viability of production than small-scale farming. Rondhi et al. (2020) suggested that farmer groups and extension services to small-scale farmers are promising to improve their participation in contract farming. This means that the mandate to support collective groups as a bigger umbrella of the secondary cooperatives that service various affiliated primary cooperatives through the programme is very significant, compared to assessing individual farmers that had less impact than supporting a group of many farmers at once.

The variable, specialised commodity, produced has a positive coefficient of 0.007, which means that an increase in the predictor leads to an increase in the predicted probability. The variable, commodity, produces a positive effect on participation in the Agri-Park programme and it is statistically significant at 5% level (p= 0.022). This outcome suggests that farmers that produced special commodities that had been selected for the economic viability of the area identified by the department as the FPSU, within the district and per local municipality, are likely to participate in the programme, compared to smallholder farmers that are producing commodities that are not selected for that locality within the programme. According to DRDLR (2015), when FPSU and Agri-hubs were identified, the main aspects were economic viability, commodity suitability within the locality identified, the high-value commodities chain, growing production within the area and available resources.

The variable, distance to Agri-Park, has a negative coefficient of -0.119, which indicates that an increase in the predictor leads to a decrease in the likelihood of the farmers participating. However, this means the distance to Agri-Park harms the participation of farmers towards the programme and it is statistically significant at 5% level (p= 0.047). This outcome depicts that farmers not within the prescribed locality of radius are likely not to participate in the programme, compared to smallholder farmers that are within the 50 km radius. According to DRDLR (2016), the FPSU is designed to have catchment areas of 50km in low-density areas and 10km in high-density areas, indicating that there will be several of them per district. Furthermore, DRDLR (2016) specified that the AH is designed to have catchment areas of 120km in low-density areas and 60km in high-density areas, representing fewer AHs than FPSUs. Only farmers within the recommended distance are considered to participate. The results concur with Khoza et al. (2019), finding which reported a negative effect between distance to market (agro-processing) and participation.

4.3.2 The benefits of participating in Agri-Parks

The Propensity Score Matching model was used to analyse objective 3: the direct and indirect benefits of the Agri-Park programme. Two methods were used, such as the Nearest Neighbour (NN) and Kernel matching methods, to estimate the impact of the Agri-Park participation on project or farm income. Table 4.6 results below show the impact of participating in the programme.

The Propensity Score Matching for the impact of participation in the Agri-Park Programme towards direct and indirect benefit within the programme (Farm income).

Table 4.6: Propensity Score Matching

Matching Method	Outcome Variable	Direct & Indirect benefits			Standard Error	T-Test
		Treated group (Participants)	Control group Non-Participant	ATT		
Nearest Neighbour (NN)	Smallholder Income	6715.30	4328.22	2387.08	1200.954	0.047**
Kernel Matching	Smallholder Income	6297,60	4421.35	1876.25	484.002	0.190*

*****, **, * Represent the level of significance at 1%, 5% and 10% respectively. Source: Results from SPSS (Version 27), generated from Survey, 2021.**

The estimates for the average smallholder farmers' income earned from the Agri-park participation range from 6715.30 to 6297.60, based on the matching method used. The minimum and maximum income for participants range from 6715.30 to 6297.60, showing that participants received high farm income compared to non-participant farmers' income which ranges from 2387.08 to 1876.25. These positive results indicate that participating in Agri-Park helps to enhance farm incomes of smallholder farmers and is significant at 5% level.

The positive impact of the Agri-Park programme participation on the performance of smallholder farmers concurs with the studies of related programmes within the department, such as the Recapitalisation and Development Programme (Shabangu, (2020) and Mabuza (2016) in South Africa. The results of the study propose that the participation of smallholder farmers in the Agri-Park programme increases the propensity of an improved project or farm income, as compared to smallholder farmers that did not participate in the Agri-Park programme. The programme has made some progress towards improving the socio-economic status of the beneficiaries, particularly in terms of production, training, and mechanisation hired, but much still needs to be done to ensure that the programme achieves its objectives and the most challenge is financial constraints (Mabuza,2016). The suggestion of these outcomes considers the

significant role of funding, capacity building (training) and extension services for smallholder farmers and hence that they can be more engaged as they are experienced in the agricultural business.

The distribution of estimated treatment, dependent variable (y-list) and variable (x-list)

Table 4.7: Distribution of estimated variables

Group	Observation	Mean	Standard Error	Minimum	Maximum
Total Smallholders farmers (Income)	128	242 861,40	140 319.50	22 000.00	640 000.00
Treatment (Participant)	64	326 701.40	134 103.20	86 000.00	640 000.00
Control (Non-Participant)	64	159 021.40	86 177.32	22 000.00	435 000.00

Source: Results from SPSS (Version 27), generated from Survey, 2021

Table 4.7 above shows the estimated means, standard errors and minimum and maximum outcomes from the participants and non-participants within the programme. The results depict that participant farmers are benefitting from the direct and indirect benefits of the Agri-Park programme. One direct benefit that farmers are receiving from the programme is income, which ranges from R 86 000.00 to R 640 000.00 for the treated group (Agri-Park participants) and non-participant income ranges from R 22 000.00 to R 435 000.00, which is derived from sales. Hence, participant farmers received benefits, such as training, mechanisation hire and production inputs can employ some labourers in their different projects compared to non-participants who can hardly do that.

4. Chapter summary

The chapter presented and discussed the results of descriptive analysis of the Agri-Park participant and non-participant smallholder farmers. The chapter entails descriptive statistics, such as mean values, frequencies, percentages, charts, and graphs. The smallholder farmers' demographic factors, gender, age, marital status, education level, employment, land ownership, farming experience, household size and socio-economic

factors, such as the source of income, access to market, access to mechanisation and access to production inputs were covered.

The study results indicated that the majority of smallholder farmers in the study were more male than female smallholder farmers and most participant farmers within the programme were dominated by males than females. The majority of smallholder farmers were stable and married, followed by a single farmers' group. In the study, the findings revealed that not many youth farmers are participating in the programme, hence most adults are more engaged in agricultural farming and are in the programme. The outcome also depicts that most experienced farmers are participating in the programme and it was expected, as the farming experience factor is vital in bearing more knowledge on the entire production cycle and maximising the overall performance.

The results from the thematic analysis show eleven main themes emerged, which are the mobilisation process, infrastructure, locality, sustainability, productivity and food security, rural economy transformation and ownership, job creation, farmers' production support unit and the Agri-hub status, mechanisation, government funding and the challenges of the implementation process. The results indicated that a relationship between these main themes and sub-themes that emerged from the thematic analysis provides these research findings that add to the understanding of the Agri-Park implementation approach dilemma. The results indicate that the main challenges faced by the Agri-Park programme mechanisms are the way the programme interventions, such as budget constraints and coordination and implementation measures. Hence, the Agri-Park programme is not fully supporting smallholder farmers with the market to maximise their livelihoods and incomes. In addition, the programme is operating at a slow pace because there is a timeframe for every milestone in the programme, and it is always missed.

The results from the Probit model indicate that variables, such as gender, age, education level, access to training, market access, farming experience, hectares produced, specialised commodity and distance to the Agri-Park, had the greatest influence in determining the farmers' participation in the Agri-Park programme. All the independent variable coefficients possessed the hypothesised direction of influence on the dependent variable. Furthermore, other variables, such as marital status, employment status, household size, access to transport, access to marketing

information, access to credit and off-farm income were not significant in explaining the smallholder farmers' participation in the Agri-Park programme.

The results from the Propensity Score Matching model indicate that the estimates for the average smallholder farmers' income earned from the Agri-park participation range from 6715.30 to 6297.60, depending on the matching method used. The minimum and maximum income for participants range from R 86 000.00 to R 640 000.00, indicating that the participants received high farm income and non-participant farmers' income ranges from R 22 000.00 to R 435 000.00. These positive results indicate that participating in Agri-Park helps to improve farm incomes of smallholder farmers and is significant at 5% level.

CHAPTER 5

Summary, Conclusion and Recommendations

5.1 Introduction

This chapter outlines the findings' summary and conclusions of the study. Furthermore, it provides recommendations and areas for further research. The main purpose of this study was to assess an existing Agri-Park intervention's influence on stimulating rural economy transformation (market growth) of the smallholders in the North West Province. The summary is drawn from all the previous chapters, while the conclusion and recommendations are drawn from the findings presented by descriptive statistics and inferential models. In accomplishing this purpose, the study addressed specific objectives namely:

- To assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province.
- To identify and highlight the socio-economic factors affecting farmers to participate in the Agri-Park mandate in the North West province.
- To measure the direct and indirect benefits of the Agri-Park programme in the North West province.

5.2 Methodology

Data were collected from the three selected districts: Bojanala platinum, Ngaka Modiri Molema and Dr Ruth Segomotsi Mompati. Stratified random sampling was used to select 128 smallholder farmers for the study. The farmers were stratified into two strata: Agri-Park participants/beneficiaries and non-participants. From the stratum group, random sampling was employed to obtain 64 Agri-Park participants and 64 non-participants. The sampling was focused on smallholder farmers that are producing different commodities (crops) and farming with livestock. Agri-Park participants were smallholder farmers affiliated with the secondary cooperative that had benefitted from the programme. Data were gathered through a structured questionnaire and the study applied both qualitative and quantitative methods.

The collected data were analysed using Microsoft excel, Statistical Package for Social Science (SPSS version 27) and STATA (version 15), hence applying econometric models. The qualitative method was examined using the thematic analysis to answer

the objective: to assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province.

5.3 Descriptive results

The smallholder farmers' demographic factors were: gender, age, marital status, education level, employment, land ownership, farming experience, household size and socio-economic factors, such as the source of income, access to market, access to mechanisation and access to production inputs.

The study results indicated that the majority of smallholder farmers in the study were male (58%) than female smallholder farmers (42%) and most participant farmers in the programme were dominated by males than females. This was consistent with the findings that mostly, agriculture is dominated by male than female farmers. The majority of smallholder farmers were stable and married where participants constitute (47%) and non-participants (45%), followed by a single farmers group. In the study, the findings suggested that only a few young farmers are participating in the programme, hence most adults are engaged in agricultural farming and are in the programme. The outcome also depicts that most experienced farmers are participating in the programme and it was expected as the farming experience factor is vital in bearing more knowledge on the entire production cycle and in maximising the overall performance.

The household size for smallholder farmers ranges from a minimum of 3 to 11 members and most of them work in the project, as most of them are cooperative entities that are formed by a minimum of five members. Farmers that were participating in the study specialised in commodities, such as crop production (maize, sunflower, Lucerne, barley and vegetables) and livestock production (cattle, goats, sheep and poultry). Strikingly, those commodities are the mains selected for the programme, and match with the environmental and economic aspects in the North West province. The findings indicated that most farmers are the main drivers of their projects. This means that they are practising farming full-time and are self-employed, with 93% of participants and 92% of non-participants. Only a few farmers were involved in other businesses (off-farm) to enhance their income.

Education and skills are the keys to success in every sector, including agriculture. The majority of smallholder farmers possessed matric as the highest education level, followed by primary education. Some farmers also possess post matric, Adult Basic

Education Training and those who never went to school. Various factors affect smallholder farmers not to participate in the Agri-Park programme due to non-affiliation with a secondary co-operative, low agricultural income, a lack of production inputs, locality, a lack of information, site selection and the type of infrastructure. The challenges that farmers are facing towards market accessibility include: the quality of product, letters of intent/contracts, marketing information, income generation and competition. Most smallholder farmers' goal is to produce and sell into markets to generate income profitably, as the market is a core link between farmers and consumers. Some market outlets for smallholder farmers in the study are hawkers, Agro-processing, auctions, retailers, and local supermarkets. In terms of Agri-Park participation, the result shows that both participants and non-participants constitute 50%. The findings also show the direct and indirect benefits that smallholder farmers are receiving from the programme including access to mechanisation, access to production inputs, access to training, access to markets and agricultural income.

5.4 Results of thematic analysis (Qualitative data)

The qualitative method was examined using the thematic analysis to answer the objective: to assess the implementation approach of Agri-Parks interventions (FPSU & Agri-Hub) in the North West province. The main eleven themes that emerged were mobilisation process, infrastructure, locality, sustainability, productivity and food security, rural economy transformation and ownership, job creation, farmers' production support unit and agri-hub status, mechanisation, government funding and the challenges of the implementation process. The relationship between these main themes and sub-themes that emerged from the thematic analysis provides this research with the study findings that add to the understanding of the Agri-Park implementation approach dilemma. Arguably, this study provided answers to fill the research knowledge gap in the agricultural sector.

The study also finds notes that the main challenges faced by the Agri-Park programme mechanisms are the programme interventions, such as budget constraints and coordination and implementation measures are coordinated. International experience shows that several aspects, such as physical and financial necessities, are required in the process of implementing and monitoring the Agri-Parks programme to guarantee their achievement. Therefore, aspects such as the Agro-industrial development

potential, required infrastructural facilities, management, economic issues, finances, promotion, the potential economic impact of the park in the region, location, size and composition of the park need to be considered. This means all the required resources will set the plan, and implementation and lead to the full functionality of each Agri-Park. In creating the effectiveness of the Agri-Park, several factors have a positive impact on the operationalisation of the park. The following phase is based on the operationalisation of the park and includes production efficiency, infrastructure development, market and commodity value chain development and locality of the FPSU and Agri-Hubs that are economically viable.

5.5 Empirical Results

The Probit model results indicate that variables (gender, age, education level, access to training, market access, farming experience, hectares produced, specialised commodity and distance to the Agri-Park) had the greatest influence in determining the farmers' participation in the Agri-Park programme. All the independent variable coefficients possessed the hypothesised direction of influence on the dependent variable. Furthermore, other variables, such as marital status, employment status, household size, access to transport, access to marketing information, access to credit and off-farm income, were not significant in explaining the smallholder farmers' participation in the Agri-Park programme.

The Propensity Score Matching model outcomes indicate that the estimates for the average smallholder farmers' income earned from the Agri-Park participation range from 6715.30 to 6297.60, based on the matching method used. The minimum and maximum income for participant smallholder farmers ranges from R 86 000.00 to R 640 000.00, showing that participants accumulated high farm income and non-participants farmers' income ranges from R 22 000.00 to R 435 000.00. These positive results indicate that participating in Agri-Park helps to improve farm incomes of smallholder farmers and is significant at 5% level.

5.6 Limitation of the research

The study documents that there was arguably little literature available about the experiences of the Agri-Park programme in South Africa, and due to this current situation, the research area is relatively new in this field. As a result, the availability of information, and economic and social conditions in South Africa differ in each province.

The findings of this research, therefore, cannot be generalised to every province, as the dynamics of the programme differ. To that end, more in-depth research is required based on the specific conditions of the country. Hence, this shall be based on a small body of work that focuses on the agricultural industry's experiences towards the Agri-Park programme's interventions, such as market outreach, mechanisation hiring process, training, etc. The Agri-Park programme on the agricultural sector research is still ongoing in South Africa as the programme is still active. This means that the continuation of the programme may bring a new and unexpected challenge in the later stages.

5.7 Areas for future research

The research only sheds light on the factors, implementation and benefits of participation in the Agri-Park programme but does not examine the overall sustainability of the programme. Similarly, the study only sheds light on the factors, implementation and benefits of participation in the Agri-Park programme but does not discuss the financial analysis (spending and budgeting) of the programme. Hence, studies should be conducted in future that would address the sustainability of the programme and assess the financial analysis of the programme in the North West province.

The study assessed existing Agri-Park interventions, such as Agri-hubs and Farmers' Production Support Units, on stimulating rural economic transformation (markets growth) of smallholders in the North West Province only. The Agri-Parks programmes are implemented in all nine provinces in the country, therefore, it is suggested that similar studies should be conducted in the whole of South Africa to assess their impact towards rural economic transformation.

The gender composition of the sample of the interviewed smallholder farmers was dominated by males, with an overall 58%. Hence, this research recommends that in future, a study should be conducted with an equal representation of males and females.

5.8 Conclusion

Linking smallholder farmers to access agricultural markets and basic services, such as mechanisation, production inputs, training, and extension services, remain crucial and involve several factors. To promote access to markets through FPSU and Agri-hubs, the government should prioritise enough funds (budget) to make the Agri-Park operate at full throttle so that rural farmers can be active and generate income for their struggling businesses, which are still in distress. From the study, it can be concluded that the programme, Agri-Park, is not fully supporting smallholder farmers with the market to increase their livelihoods and incomes. The programme is not providing what was intended to win the allocated time frame. The evidence also showed that the DRDLR is failing to maximise the effort to support the Agri-Park with enough budget, which results in the programme operating at a very slow pace. Therefore, the government should collaborate with other stakeholders and prioritise enough budget to finalise the mandate of the park. Most farmers are not participating and enjoying the Agri-Park benefits, which has a negative impact, as farmers are still struggling to perform because they are lacking in basic services.

Recommendations

The government should prioritise the full operationalisation and ensure all the following objectives are implemented so that black rural farmers can benefit through Agri-Park Programme:

- Support comprehensively (funding) rural enterprise systems (agro-production, processing, logistics, marketing, training and extension services in district municipalities and developments on underused land).
- Ensure Agri-Parks facilitates the efficient movement of rural produce to markets through prioritising all the components of the programme to operate fully.
- Increase smallholder agricultural productivity with enough provision of production inputs and create more jobs through the programme, leading to a reduction in rural poverty and unemployment (FPSU).

Given the importance of agriculture in ensuring inclusive growth, job creation and poverty reduction in South Africa, the Government should prioritized the development

of the South Africa Agri- Parks through agligning its mandates to AAMP to provide the required infrastructure that will provide an agro-industrial base that will drive demand for farm produce, offer economies of scale, and expand agri-industrial processing. The South Africa Agri-Parks Program should also integrate rural producers and small businesses with commercial value chains and markets; encourage the inclusion of informal economic actors into the formal system; stimulate growth in townships,and enhance the business climate to mobilize private capital.

In this regard, the Government of South Africa should prioritised and provide the Department of Agriculture Land Reforms and Rural Development MICA Grant Request towards South Africa Agri-Parks development as one of the major areas of strategic drive in the country. The intervention shall enable the Department to procure a transaction advisor to advice on the preparation, implementation, and marketing of the program for private sector investments. These preparation activities will lead to investor buy in and development of infrastructure in agriculture production and agro-industry projects in the selected sites.

Governments should strengthened institutional support to agro-clusters by: liberalizing production and export of certain commodities; promoting technological learning for exports (especially those biased towards small producers); supporting export promotion activities and collective marketing initiatives.Futhermore, the government should prioritised fully operationalization of Agri-Parks by strenthening DRDLR in partnership with other stakeholders such as the Department of Agriculture, Forestry and Fisheries (DAFF), and the collaboration shall extend to other government departments at all levels, including the Departments of Water Affairs, Energy, Transport, and Cooperative Governance, local municipalities,because there is a huge gap when it comes to stakeholders involvement towards building and empowering the Agri-park program.

5.8.2 Encourage youth to participate in the Agri-Park programme.

From the study results, most participants in the programme are older farmers. This is a very crucial matter for the department should prioritise youth engagement within the programme. Funding youth agricultural projects, tailoring youth education, offering training systems and encouraging agricultural bursaries and scholarships through the programme can encourage and motivate the youth to believe in the power of the ‘soil’

(attraction to agricultural sector). For example, the government should support young people to engage in the agro-processing production cycle (Agri-Parks) and through the support by providing learnerships and graduate programmes, as more practical work will be done, thus enhancing interest and patience and creating jobs for the local youth.

5.8.3 Ensure coordination, governance, monitoring and knowledge management improve, leading to an efficient and accountable Agri-Park programme

Government should constantly prioritise the monitoring, services inspection and evaluation processes so that delays and errors will be minimised at an early stage and warrant effectiveness and speedy progress towards completing fully the pending infrastructural developments, FPSU components and the entire implementation process.

For the improvement of the Agri-Parks programme, the government should consider the implementation measures, whereby the planning process must be done provincially and at the district level (office), with the engagement of officials who do the groundwork. Furthermore, the government should prioritise continuous training, to capacitate officials who are responsible for running the programme, thus ensuring a proper operation (SOP), which will enhance skills and knowledge development, through workshops, as the programme is one of the cornerstones of rural economic transformation.

DALRRD should go back to the drawing board and conduct a national special commodity, value chain and market analysis, thus determining the target site's improvement by identifying gaps, buildings and identifications of high-value commodities, growing productions within the districts or identified Agri-Park sites.

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Appendix : Questionnaires

Appendix 1: Questionnaire No:1

Farmers Questionnaire on the project: Effectiveness of Agri-Park Intervention Strategy towards the Rural Economy Transformation in the North West Province

Date: DD- MM-YYYY

Questionnaire no:

Researcher:

Mobile no:

Email Address:

This questionnaire is meant to be completed by Farmers with the assistant of enumerator. The questionnaire is based on information for Agri-Park Participation and Benefits of Smallholder farmers in North West. The information provided will be used only for the purpose of the research and will be treated with confidentiality, without mentioning names in the analysis. Please tick the correct answers and fill the blank space provided.

I agree to complete the questionnaire and do so in a completely voluntary manner. I understand that the responses will be kept confidential. Signature……

GENERAL INFORMATION

a) Questionnaire Number	
b) Name of the Farm/ Project	
c) Local Municipality	
d) Telephone/ Cell number	
e) Village	
f) District	

SECTION A: SOCIO-ECONOMIC INFORMATION

1.1 Gender of the Farmer	1. Female
	2. Male

1.2 Age of Farmer		**Years**

1.3 Marital Status	Single	1	Married	2	Divorced	3	Windowed	4

1.4 Level of Education	Never went to School	1
	Less Grade 7 (Primary)	2
	Matric	3
	Post Matric	4
	Abet	5

1.5 What is the size of the household?	

1.6 Which farming commodity(s), do you specialize with?	1	2	3
	Livestock	Crop	Mixed (livestock & Crop)

1.7How long have you been Farming? (Years)	

1.8What is the size of arable land in hectares? (Ha)	

1.9Are you employed?	1	Yes
	2	No

1.10. If Yes, where are you employed?

1	2	3	4
Government Sector	Self employed	Private	Other (Specify)

1.11 Do you have any Off-farm income?	1	Yes
	2	No

1.12 What is the Source of income for the Farmer?

1	2	3	4	5
Salary	Farming	Pension	Grant	Other (Specify)

2. LAND AND AGRICULTURE

2.1 How did you acquire the land?

Bought (Tittle deed)	1.
Leased	2.
Inherited	3.
Allocated by the Headman	4.
Renting and / or Share	5.
Other (Specify)	6.

2.2 Labour Usage

2.2.1 Questions on skilled labour	Yes	No
1. Do you employ permanent skilled labourers on your farm/project?		
2. Number of labourer's		
3. Days per year		

2.2.2 Question on Unskilled labour	Yes	No
1. Do you employ permanent skilled labourers on your farm/project?		
2. Number of labourers		
3. Days per year		

3 Fixed Infrastructure Usage (Available infrastructure)

3.1 Do you have an asset register?	1. Yes	2. No

3.1.2 Can you indicate any Five (5) most Infrastructures and Technology that you use for farm production?

Types of Infrastructure	Condition (e.g., Poor, Fair, Good, etc.)	Quantity	Age (years)	Estimated Value (R)

4. Access to Credit (Financial support)

4.1 Do you have access to Credit			Yes		No
4.2. Indicate the type of financial support farmers received		Loan	Grant	Subsidy	Other (Specify)
1. Commercial Banks	1				
2. Government	2				
3. Agricultural Cooperatives	3				
4. Other (Specify)	4				

5. PRODUCTION NFORMATION

5.1 Do you belong to any farmers organisation?	Yes		No	

5.2 If (yes), which organisation do you belong?

……
……
……

5.3 How long have you been a member of the organisation?

5.4 Which farmers ownership model do you belong?	1	2	3	4
	Primary Co-operative	Private Company	Secondary Co-operative	Other (Specify)

5.5 How long, in terms of years, have you been in involved in farming with crop/ livestock production/ (years)?

5.6 How many hectares do you use to produce crop?

	1	2	3	4
5.7 How do you access production inputs?	Grant (Vouchers)	Loan	Store/ Shops	Other (Specify)

5.8 what was the motive for ploughing crop?	1	2	3	4	5
	Income generation	Employment	Pastime	Home consumption	Other (Specify)

5.9 Do you have Access to Agricultural training?	Yes		No	
5.10If (yes), which organisation offered you a training?	1	2	3	
	Government Organisation	Private Organisation	Other (specify)	
5.11 What type of training offered?	COMMERCIAL AGRICULTURE			
5.12 Does the training offered had impact on your agricultural experience?	Yes		No	

6. MARKERTING INFORMATION

6.1 Do you have access to Market?	Yes		No	

6.2 If (yes), where do you sell your produce?

1	2	3	4	5	6
Hawkers	Agric Processing	Auction	Retailers	Local Supermarkets	Other (Specify)

6.3 How much (Quantities) do you produce tons/ kg?

6.3.1 What type of crop do you specialise with?

Produces	1	2	3	4	5	6
Type of Crop	Maize	Lucerne	Barley	Sunflower	vegetables	Other (Specify)

6.4 which production inputs do you use?

Type of Commodity	Production inputs required

6.5 Quantities vs price for crop production

Types of Crop Produced	Quantity (Kg/Tons)	Price(R)
1. Maize		
2. Lucerne		
3. Barley		
4. Sunflower		
5. Vegetables		
6. Other (Specify)		

6.6 Sales (sold) vs Expenditure (consumed)

Types of Crops Produced	Variable inputs	Hectares (ha)	Expenditure (Estimated Cost)	Sales (R)
1 Maize				
2 Lucerne				
3 Barley				
4 Sunflower				
5 Vegetables				
6 Other (Specify)				

Livestock's

6.7 How many Large Livestock (Cattle) do you have?

Type of cattle	Number
1. Bull	
2. Heifer	
3. Calf	

6.8 How many Small Livestock's do you have?

Type of Livestock	Number
1. Goats	
2. Sheep's	
3. Pigs	
4. Other (Specify)	

6.9 Quantities (number) vs price for Livestock's production

Types of Livestock	Sales (Number)	Price (R)
1. Bulls		
2. Heifer		
3. Calf		
7. Goats		
8. Sheep's		
9. Pigs		
10. Other (Specify)		

7. What do you do with your produce?

1	2	3	4	5
Home consumption	Home consumption and Marketing	Market	Processing and Market	Other (Specify)

8. Water Source

1. Borehole	Yes	No
2. River	Yes	No
3. Municipality	Yes	No
4. Other (Specify)	Yes	No

9. Electricity Source

1. Do you have electricity on your project?	Yes		No	
2. Type of electricity				
3. Estimated amount per month				

10. Challenges based on access to markets?

……
……
……
……

10.1 Do you transport your produce to market?	Yes		No	

11. 2 How do you transport your produce to market?

1	2	3	4
Self-transport	Hired transport	Collective transport	Other (Specify)

10.3 What is the distance from point of production to the nearest market?

Kilometres (KM) –

10.4 Do you have access to market information?	Yes	No

10.5 What do you think can be done to meet the grades required in the market?

……

……

……..

11.6 What are the marketing Constraints do you experience?

…….

……..

……..

10.7 Do you have Access to Agro-processing facilities?	Yes		No	
10.8 If (yes), which Agro-processing facility offered services or assistance?	1	2		3
	Government Organisation	Private Organisation		Other (specify)
10.9 What type of service offered?				
10.10 Does the Agro-processing service offered have impact on your business/project?	Yes		No	

12. What challenges hindered you to participate in Agri-Park intervention (FPSU & Agri-Hub?

……..……
……
……

SECTION B

These questions are based on direct and indirect benefits of Agri-Park Programme in North West.

1. DIRECT AND INDIRECT BENEFITS OF AGRI-PARK

1.1 Do you participate on Agri-Park (farmer's production support unit)?	Yes		No	

1.2 Are you a member of Primary Co-operative affiliated under Secondary Co-operative; Agri-Park Umbrella?	Yes		No	
1.3 Did you benefit with Agri-Park support?	Yes		No	
If (yes), Specify the Agri-Park support you received …….. …….. …….. …….. ……..				
1.4 In your opinion is Agri-Park support had impact on farmer's income and growth?	Yes		No	
1.5 Is FPSU and Agri-Hub facilities assisting with market?	Yes		No	
If (yes), Specify how the Agri-Park act as market hub …… …… …… …… ……				

2. What are the Direct and Indirect benefits did you received? (Tick the option)

1. Agricultural income (sales)	Yes		No	
2. Production inputs	Yes		No	
3. Increased in Productivity	Yes		No	
4. Employment	Yes		No	
5. Training	Yes		No	
6. Access to Mechanisation	Yes		No	

3. The Agri-Park Participation

3.1 Do you Participate in Agri-Park mandate (FPSU & Agri-Hub) in North West?	Yes		No	

3.2 If Yes, which FPSU or Agri-Hub did you affiliated to and District?

……
……
……

3.4 If No, what do you think are the reasons of not participating in Agri-Park? Please tick the box with the cross

3.4.1The factors affecting farmer not to participate in Agri-Park?

1. Not affiliated under Secondary co-operative	Yes		No	
2. Low Agricultural income (sales)	Yes		No	
3. Lack of Production inputs	Yes		No	
4. Low Productivity	Yes		No	
5. Locality (Distance) to Agri-Park	Yes		No	
6. Lack of information	Yes		No	
7. Site Selection	Yes		No	
8. Type of Infrastructure (Not accommodating production)	Yes		No	
9. Other (Specify)				

4. In your own opinion what can be done to improve farmer's participation on Agri-Park?

……

……
……

5. **In your own view, what can Government do to improve rural economy transformation in North West Province through Agri-Park?**

……
……
……
……
……

Appendix 1: Questionnaire No:2

DRDLR Official Questionnaire on the project: Effectiveness of Agri-Park Intervention Strategy towards the Rural Economy Transformation in the North West Province

Date: DD- MM-YYYY

Questionnaire no:

Researcher:

Mobile no:

Email Address:

This questionnaire is meant to be completed by Official with the assistant of enumerator. The questionnaire is based on information of Agri-Park Participation, Implementation process and Benefits for Smallholder farmers in North West. The information provided will be used only for the purpose of the research and will be treated with confidentiality, without mentioning names in the analysis. Please tick the correct answers and fill-in the blank space provided.

I agree to complete the questionnaire and do so in a completely voluntary manner. I understand that the responses will be kept confidential. Signature……

GENERAL INFORMATION

g) Questionnaire Number	
h) Organization / Institution	
i) Directorate / Unit	
j) Telephone/ Cell number	
k) Position	
l) District	

SECTION A: BIOGRAPHIC INFORMATION (OFFICIAL)

1.1 Gender of the Official	1. Female
	2. Male

1.2 Highest qualification obtained/Passed	Matric	1
	Diploma Degree	2
	Degree	3
	Post-graduate diploma	4
	Post-graduate degree	5

2. SECTION B

Question(s) based on how the Agri-Park interventions (FPSU & Agri-Hub) implemented in North West?

2.1 What is your own understanding of Agri-Park Programme?

……
……
……

2.2 Agri-Park (FPSU & Agri-Hub) implementation in North west Province

2.2.1 Was the mobilisation process (community) involved?

Yes		No	

If yes / No, explain how

……
……
……

2.2.2 In your opinion was the infrastructure built accordingly to the Department business plan?

Yes		No	

If yes / No, explain how

……
……
……

2.2.3 How much the budget used for the development of the FPSU and Agri-hub since the 2015 to date?

……..
……..
……..

2.2.4 Was the location and size of the park selected suitable to cater the district?

Yes		No	

If yes / No, explain how

……
……
……

2.2.5 In your opinion, does these factors properly implemented per District?

1. Locality /distance of the Park	Yes		No	
2. Site size selection	Yes		No	
3. Is Auction site properly accommodating enough stock	Yes		No	
4. Does the park suitable to enhance market	Yes		No	
5. Does the park suitable to enhance Agro-Processing	Yes		No	

2.3 One of the Government mandates towards Agri-Parks “is to support the Agri-Parks mandate for 10 years, which means from 2015-2025, for sustainability.

Do you think Agri-Parks can sustain itself after 10 years?

Yes		No	

If yes / No, explain how Agri-Park will manage sustainability?

……
……
……

2.4 According to the Agri-parks policy “, its objective is to supports the creation of a nexus of rural agricultural businesses across South Africa to serve as primary vehicles of agrarian transformation and comprehensive rural development. Its intended impact is to create “by 2030, a transformed agrarian sector, improved agricultural productivity and creation of new jobs through expanded rural economy, agro-processing and reduction of rural unemployment from 49% to less than 40%”.

2.4.1 From your opinion is Agri-Park in North West Province transforming rural economy through skilled smallholder farmers/producers with ownership of the majority of Agri-Parks equity (70 %)?

Yes		No	

If Yes/No, how is the current situation in North West?

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……
……

2.4.2 Is Agri-Park Increasing agricultural productivity in the smallholder sector leading to improved food security and nutrition?

Yes		No	

If yes/No, how is the current situation in North West?

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2.5. According to National Development Plan (NDP) “One million new jobs created in Agricultural Sector and one million Increased use of under-utilised communal land and land reform farms into full production and expanded irrigated agriculture by 2030”.

2.5.1 Will Agri-Park managed to create enough new jobs and increased communal land and reform farms unto full production, with this current situation?

Yes		No	

If yes/ No, please explain?

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……..

2.6 In your own opinion what can Government do to improve rural economy transformation in North West Province through Agri-Park?

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2.7 How can Agri-Park contribute to tackling the youth unemployment problem?

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2.8 The farmer production support unit (FPSU): “A rural Smallholder farmers outreach and capacity building unit that links farmers with markets” FPSU does primary collection, some storage, provides some processing for local markets and extension services, including mechanisation.

2.8.1 In your own view, does FPSU in North West Province provide primary collection, storage and processing process?

Yes		No	

If yes/No, please explain.

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……..……
……

2.8.2 Does FPSU host Auction for smallholder farmers as market?

Yes		No	

If yes, please explain the process

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……

2.8.3 What are the challenges with fully operational/ functionality of the FPSU?

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……

2.9 The Agri-Hub "is a production, equipment hires, processing, packaging, logistics, innovation and training facility".

2.9.1 How is the status/ situation of the Agri-Hub in the North West?

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……

2.9.2 Is Agri-Park supporting farmers with mechanisation and Agri-processing value chain?

Yes		No	

If yes/No, please explain.

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……..

2.9.3 Is Agri-Hub fully functioning in North West?

Yes		No	

If yes/No, please explain.

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……

2.9.3 What are the Challenges with fully operational/ functionality of the Agri-Hub?

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3 Financial Support (Funding)

3.1 What is the total amount of budget realised for the development of Agri-Park (FPSU & Agri- Hub) to date in North West?

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……..
……..
……..

3.2 In your own view, does the budget for the development of Agri-Park enough?

Yes		No	

If yes/No, please explain.

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3.3 If Rural infrastructure Development (RID) and Rural Enterprise Industrial Development (REID) funding was re-directed to Agri-Parks development, what was the impact on the programme expenditure?

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……
……

3.4 Is Government funding enough to sustain the Agri-park mandates?

Yes		No	

If yes/No, please explain.

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3.5 In your own view, what is the potential viability of Agri-Park moving forward?

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3.6 Was the Agri-Park model developed centrally and supplied to provincial offices for the implementation?

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3.6.1 Was each provincial office directed to develop its own design criteria for Agri-Park?

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4. What are the challenges with the implementation of Agri-Park Programme since the inception in 2015 to 2021?

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5. In your opinion is Government doing enough on the progress and monitoring of the Agri-Park?

Yes		No	

If yes/No, please explain.

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……

6. What recommendation(s) can you give concerning the improvement of the entire Agri-Park Programme Strategy?

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Appendix 1: Questionnaire (Checklist)

Checklist for the project: Effectiveness of Agri-Park Intervention Strategy towards the Rural Economy Transformation in the North West Province

Date: DD- MM-YYYY

Questionnaire no:

Researcher:

Mobile no:

Email Address:

THESE CHECKLIST IS ALIGNED WITH THE DEPERTMENTAL CHECKLIST FOR WHAT IS CONSIDERED TO BE CRITICAL FOR FUNCTIONALITY OF THE FARMERS PRODUCTION SUPPORT UNIT (FPSU).

Current minimum requirements for functional Farmer Production Support Unit (FPSU), as stated by the National Department (DRDLR).

1.1 ADMINISTRATIVE INFRUSTRUCTURE

a) Administrative offices aligned to the Human Resources contingent	Yes		No	
b) Ablution facilities	Yes		No	
c) Accommodation for FPSU manager	Yes		No	

1.2 SECURITY INFRUSTRUCTURE

a) Fencing	Yes		No	
b) Security Office	Yes		No	
c) Security Lightening	Yes		No	

1.3 HUMAN RESOURCES

a) FPSU Manager	Yes		No	
b) Extension Officer (s)	Yes		No	
c) Veterinary Support	Yes		No	
d) Soil specialist (s)	Yes		No	
e) General Workers	Yes		No	
f) Qualified Mechanic	Yes		No	
g) Caretaker/ Ground-men/ Artisan	Yes		No	

h) Security Officers	Yes		No	
i) Secondary Coop Manager and support staff	Yes		No	

1.4 MECHANISATION IN SUPPORT OF FPSU CATCHMENT COMMODITIES

a) Tractors	Yes		No	
b) Equipment's to support farmers	Yes		No	
c) Repair and Maintenance (workshop tools)	Yes		No	

1.5 PRODUCTION INFRUSTRUCTURE, DEPEND ON COMMODITIES SUPPORTED FROM THE FPSU

a) Pack-house	Yes		No	
b) Cold Storage	Yes		No	
c) Storerooms	Yes		No	
d) Dipping and Handling Facilities	Yes		No	

1.6 SERVICE INFRUSTRUCTURE

a) Water	Yes		No	
b) Sanitation	Yes		No	
c) Energy/ Electricity	Yes		No	
d) Access Roads	Yes		No	
e) Paving	Yes		No	

1.7 OFFICE FURNITURE, AND EQUIPMENT

a) Tables	Yes		No	
b) Chairs	Yes		No	
c) Computer system	Yes		No	

1.8 PRODUCTION INPUTS SUPPORT

a) Seeds	Yes		No	
b) Fertilizer	Yes		No	
c) Chemicals	Yes		No	
d) Fuel	Yes		No	