NAMC

Promoting market access for South African agriculture

THE SMALLHOLDER MARKET ACCESS TRACKER

(SMAT)

BASELINE REPORT

A CASE OF SMALLHOLDER MAIZE PRODUCERS IN SOUTH AFRICA

2023/24

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SMAT
Smallholder Market Access Tracker

Smallholder Market Access Tracker (SMAT) is a tool that has been developed by the NAMC, with the help of a reference group, to measure the progress in the achievement of the market access goal for smallholder farmers in South Africa.

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Lastly, the team acknowledges the following **SMAT Reference Group members** who provided valuable input into the development of the **SMAT tool**, either at the concept stage or at various stages of development.

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LIST OF ACRONYMS

ABBREVIATION	DESCRIPTION
AAMP	Agriculture and Agro-processing Master Plan
BATAT	Broadening Access to Agriculture Thrust
CASP	Comprehensive Agricultural Support Programme
CEC	Crop Estimates Committee
DALRRD	Department of Agriculture, Land Reform and Rural Development
EU	European Union
FAO	Food and Agriculture Organization
GRAIN SA	Grain South Africa
IGC	International Grains Council
JSE	Johannesburg Stock Exchange
MAP ACT	Marketing of Agricultural Products Act
MT	Metric Tons
NAMC	National Agricultural Marketing Council
NDA	National Department of Agriculture
PTO	Permission to Occupy
RDP	Reconstruction and Development Programme
SMAT	Smallholder Market Access Tracker
UN	United Nations
USD	United States Dollar
USDA	United States Department of Agriculture

EXECUTIVE SUMMARY

The NAMC developed a tool to measure progress towards achieving market access for all participants in the agricultural sector, particularly for smallholder farmers in South Africa. The Smallholder Market Access Tracker (SMAT) tool construction commenced in April 2016 when the first pilot was conducted on potatoes. A second pilot was then conducted on beef in 2018. These pilots culminated in six baselines completed between 2019 and 2024 in the citrus (2019), broiler (2020), raisins (2021), wool (2022), cotton (2023), and maize (2024) industries. In the initial stages – up to the broiler baseline – the process was overseen by a panel of representatives selected from various South African agricultural stakeholder organisations (henceforth referred to as the Reference Group).

The SMAT tool comprises indicators sourced primarily through a survey specifically designed to collect primary data on smallholder market access. The indicators were identified using key market access variables gathered from empirical research and form the heart of the SMAT tool. They could have positive, negative, or neutral effects on smallholder farmers' likelihood of market access. The indicators are categorised into two groups: the first group tracks progress from the supply side (farmers' perspective), and the second group tracks progress from the demand side (market's perspective). These indicators are meant to inform policymakers of the situation per industry tracked, thereby enabling the formation and continuation of more effective programmes or interventions towards achieving market access.

This report is the sixth in a series of baseline studies focusing on smallholder maize farmers. It is based on the results generated from a survey of 332 farmers from the Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga, North West, and Gauteng provinces.

In terms of the farmers' profile, the results indicate that a typical smallholder maize farmer is a 58-year-old male who is fairly educated, having completed secondary or tertiary education, which makes it easier for him to collect and process information to make informed decisions. The study categorises farmers by land size, and the findings suggest that farmers with 1-5 hectares are older, less educated, and rely mainly on social grants and pensions for a living. They are often sole proprietors. They tend to lose money as their expenses outweigh their income or consumption. Despite this, they feed their families and create opportunities for other community members.

Farmers with 5.3 hectares and more had higher income and profits than those with 1-5 hectares and were dominated by farmers who registered private farms or operated as cooperatives. In almost every way, the farmers in the 120-350 hectare and 400–680-hectare categories are very similar. The observed similarity indicates that farmers either allocate less land to maize cultivation due to capacity constraints or incorporate mixed farming practices, where maize occupies a smaller portion of the land or is primarily used for animal consumption. The limited access to services, facilities, implements, and support provided by relevant organisations, including the government, is also visible. Even individuals with access are dissatisfied with these products' adequacy, relevance, availability, effectiveness, and condition. Some farmers have stated that they do not spend optimally on inputs due to high input costs, which may impact their productivity.

Farmers have access to various markets, including millers, retailers, wholesalers, animal feed manufacturers, silos, other farmers, households in neighbouring communities, and "other" markets. It is commendable and can potentially improve farmers' overall perception of the markets by allowing them to quit those they perceive negatively. However, farmers perceive some markets that appear to dominate in their respective provinces negatively.

Many of the recommendations involve various stakeholders. Consequently, collaboration and alignment of targets were emphasised, signifying the establishment of value chain round tables and production schemes as part of implementing the Agriculture and Agro-processing Master Plan (AAMP). Furthermore, it was recommended that the NAMC SMAT team consider studying the market perspective, as stated in the SMAT initiative's concept note. Farmers were encouraged to unite, develop, and upscale cooperative strategies, which yield economic benefits and promote their overall advancement.

The Agriculture and Agro-processing Master Plan is a product of negotiations between government, business, labour and civil society organisations in the agriculture and agro-processing sectors.

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SECTION 1:

INTRODUCTION

SECTION 1: INTRODUCTION

1.1 Background

One of the NAMC's founding objectives, as stipulated in the Marketing of Agricultural Products Act (Act 47 of 1996), is to increase market access for all participants. In 2016/17, the NAMC created a Smallholder Market Access Tracker (SMAT) tool to measure progress towards achieving "market access for all participants," particularly for smallholder farmers[1] in South Africa. The rationale for creating such a tool stems from the general perception and, in some cases, study findings indicating a lack of progress in addressing the integration of smallholder farmers, primarily black, into South Africa's mainstream economy. These well-articulated policies date back to 1994 when the ruling African National Congress (ANC) published the Reconstruction and Development Programme (RDP) to create a restructured agricultural sector that "spreads the ownership base, encourages small-scale agriculture, further develops the commercial sector and increases production and employment" (African National Congress, 1994). Following the RDP sentiments, the White Paper on Agriculture published in 1995 advocated for providing support services to enable farmers to move into commercial farming if desired (Makhura et al., 1996).

The then National Department of Agriculture (NDA) developed the Broadening Access to Agriculture Thrust (BATAT) in 1995 as its RDP project aimed at improving small-scale farmers' access to agricultural services in five developmental areas, namely, financing, technology, transfer systems, human resources, and marketing. A component of this initiative, known as the "BATAT Marketing Drive," sought to "improve small-scale farmers' ability to seize marketing opportunities" (Van Renen, 1997). Over the past two decades, similar policies and programmes have been created to support the growth and development of smallholder farmers. The most prominent and significant is the Comprehensive Agricultural Support Programme (CASP), introduced in 2004 to support smallholder farmers and land reform beneficiaries (NDA, 2004).

Recent findings suggest that CASP and other farmer support programmes have not effectively achieved their goals (Vink et al., 2012). The need arose to measure and track the situation regarding smallholders' integration into marketing channels to assist with policy debate and formulating more effective programmes for enhancing market accessibility. Against this background, the NAMC proposed developing the Smallholder Market Access Tracker (SMAT) as a measure of progress in achieving the market access goal for smallholders in South Africa. SMAT indicators were identified and used as a basis for instrument design.

Pilot surveys were undertaken to test the SMAT instrument on the following commodities: Potatoes (2016/17) and Beef (2017/18). The pilots culminated in a baseline on citrus smallholder producers conducted in 2018/19. The second baseline was completed on smallholder broiler producers in the 2019/20 financial year. In the 2020/21, 2021/22, and 2022/23 financial years, three more baseline reports were completed in the raisins, wool, and cotton sectors. The purpose of this report is to present the sixth baseline of SMAT conducted on smallholder maize farmers. The baseline describes the status of smallholder maize farmers in terms of production and access to marketing services and markets. The idea is to uncover barriers these farmers face in entering mainstream marketing channels and recommend interventions that could enhance market access and the value of the marketable product.

[1] In the context of this baseline, a smallholder farmer is derived from the DAFF definition and refers to a new entrant who aspires to produce for the market and make a profit. The term is used interchangeably with 'communal farmers'

1.2 What is the Smallholder Market Access Tracker (SMAT)?

The SMAT is a tool that measures progress in achieving the market access goal for smallholders in South Africa. The tool aims to generate information to address the strategic objective of increasing market access for smallholder farmers in South Africa. The SMAT is helpful for the following targeted stakeholders, among others, for advisory services:

- Government
- Farmers and farmer organisations
- Fresh produce markets
- Market institutions

The SMAT is built on a rigorous process of selecting indicators. These indicators, the heart of the SMAT tool, were identified using key market access variables from empirical research. After thorough discussion under the SMAT Reference Group's oversight[2], it was decided that the SMAT indicators would be primarily sourced through a survey specifically designed to collect primary data on smallholder market access. Additional data, when required, would be obtained from secondary sources and expert or critical informant opinions. The indicators were selected based on the theoretical economic premise hypothesised to affect smallholders' likelihood of accessing the market positively, negatively, or neutrally. The indicators are further categorised into **A Indicators** (from the farmer's perspective) and **B Indicators** (from the market's perspective). **Table 1** below presents the selected indicators for the SMAT with their definitions and the nature of their effect on smallholder market access.

[2] The NAMC defines the Reference Group as a group of experts in certain fields but with a degree of diversity among them (experience, demographics, regional spread, areas of specialisation, academic inclination, sector and affiliation).

Table 1: The SMAT indicators

Name	Definition and expected nature of the relationship with market access (in parentheses)
Farmer (Supply or "Push") indicators[3]	
A1. Farmer profile:	
A1.1 Gender	The gender of the farmer (NA)
A1.2 Age	Age of the farmer (NA)
A1.3 Education	Highest education level attained by the farmer (+)
A1.4 Location	Town and province where the farmer is located (NA)
A1.5 Legal entity	Type of entity that the farmer belongs to (if any) (NA)
A2. Supply:	
A2.1 Selling of produce	Whether the farmer sells any produce (+)
A2.2 Type of market supplied	Type of market supplied by the farmer (NA)
A2.3 Quantity supplied	Quantity (quantities) supplied by the farmer (+)
A2.4 Value supplied	Value (in Rands) supplied by the farmer (+)
A2.5 Selling arrangements	Whether farmer sells through spot selling, contract, etc. (NA)
A2.6 Selling price arrangements	Whether a farmer negotiates to sell price or is a price taker (NA)
A2.7 Payment arrangements	The length of time it takes for payment to be effected (NA)
A2.8 Distance to market	Distance to the market supplied by the farmer (-)

[3] The farmer (supply or "push") indicators denote the perspective of the farmer (the supplier)

A3. Market Services	
A3.1 Access to market information	Whether the farmer has access to any source of market information (+)
A3.2 Access to storage	Whether the farmer has access to any form of storage (+)
A3.3 Access to packaging facilities	Whether the farmer has access to any packaging facilities (+)
A3.4 Access to credit	Whether the farmer has access to a credit facility (+)
A3.5 Access to training/extension	Whether the farmer has access to any training or extension service (+)
A3.6 Access to transport	Whether the farmer has access to any transport service (+)
A3.7 Rating of quality of market information	Farmer's rating of the quality of market information (1 = poor; 5 = excellent) (+)
A3.8 Rating of quality of storage	Farmer's rating of the quality of storage (1 = poor; 5 = excellent) (+)
A3.9 Rating of quality of packaging facilities	Farmer's rating of the quality of packaging facilities (1 = poor; 5 = excellent) (+)
A3.10 Rating of quality of credit	Farmer's rating of the quality of credit service (1 = poor; 5 = excellent) (+)
A3.11 Rating of quality of training/extension	Farmer's rating of the quality of training/extension (1 = poor; 5 = excellent) (+)
A3.12 Rating of quality of transport	Farmer's rating of the quality of transport (1 = poor; 5 = excellent) (+)
A4. Market Requirements	
A4.1 Awareness of market requirement	Where applicable, whether the farmer is aware of market requirements (+)
A4.2 Compliance with market requirements	Where applicable, the extent to which the farmer complies with market requirements (1 = no compliance; 5 = excellent compliance) (+)

B. Market (Demand or "Pull") perspective[4]	
B1. Market Profile	
B1.1 Type of market	Type of market supplied by the smallholder (NA)
B1.2 Market location	Town and province where the market is located (NA)
B1.3 Total market turnover	Where applicable, the total turnover of the market supplied by smallholder farmers (NA)
B1.4 Market turnover by commodity	Where applicable, the market's turnover on the specified commodity supplied by smallholder farmers (NA)
B1.5 Market tonnage by commodity	The total market tonnage of the specified commodity sourced from smallholder farmers (NA)
B2. Supply by Smallholder Farmers	
B2.1 Number of smallholders supplying the market	Number of smallholders supplying the market with the specified commodity (+)
B2.2 Volumes supplied by smallholders (t)	The total tonnage of the specified commodity supplied by smallholder farmers (+)
B2.3 Value supplied by smallholders	The total value of the specified commodity supplied by the smallholder farmers (+)
B2.4 Smallholders' market share	The total smallholder farmers' market share for all commodities supplied (+)
B2.5 Smallholders' market share/commodity	The smallholder farmers' market share of a specified commodity (+)
B3. Services Provided to Smallholders	
B3.1 Market information	Whether the market provides market information services to smallholders (+)
B3.2 Storage	Whether the market provides storage services to smallholders (+)
B3.3 Packaging facilities	Whether the market provides packaging facilities to smallholders (+)
B3.4 Credit	Whether the market provides credit facilities to smallholders (+)

[4] The market (demand or "pull") indicators denote the perspective of the market (the buyer)

B3.5 Training/extension	Whether the market provides training or extension services to smallholders (+)
B3.6 Transport	Whether the market provides transport services to smallholders (+)
B4. Minimum Market Requirements	
B4.1 Business registration	Whether business registration is a minimum requirement for smallholders (NA)
B4.2 Packaging	Whether packaging is a minimum requirement for smallholders (NA)
B4.3 Product standards	Whether product standards are a minimum requirement for smallholders (NA)
B4.4 Payment arrangements	The length of time the market takes to pay smallholders for their produce (NA)
B5. Market Performance of Smallholders	
B5.1 Rating of quality	The market's rating of the quality of products supplied by smallholders (1=poor; 5=excellent) (+)
B5.2 Rating of quantities	The market's rating of the quantities of produce supplied by smallholders (1=poor; 5=excellent) (+)
B5.3 Rating of consistency of supply	The market's rating of the consistency of supply of produce supplied by smallholders (1=poor; 5=excellent) (+)
B5.4 Rating of farmer logistics	The market's rating of the logistics for the products supplied by smallholders (1=poor; 5=excellent) (+)

Note: It is expected that sourcing data from both the supplier and buyer perspectives will assist in counter-checking results, such that data from one side is checked against data from the other side to improve overall quality and usability. NA = Not applicable.

1.3 Methodological approach to the development of SMAT

The development of the SMAT commenced in April 2016. The NAMC put together an internal research team to implement the SMAT project. A group of experts representing a wide range of agricultural stakeholders (academia, government, private sector, and non-governmental organisations) – the "Reference Group" – was appointed to oversee and advise the process and its outputs. **Figure 1** depicts the process of the development of the SMAT. Notably, the involvement of the Reference Group ended in 2020, during the broiler baseline, due to structural and policy changes within the NAMC.

As explained earlier, two pilots were conducted to test the tool, culminating in six baselines. Both the pilots and baselines form part of the output. Subsequently, an outcomes phase follows. The real worth of SMAT is believed to lie in this phase because the outcomes should be action plans and commitments by relevant stakeholders, guided by the baseline recommendations. These action plans and commitments should further form the basis for tracking progress from the baseline. In other words, beyond generating information on the status of smallholder market access, the SMAT must stimulate difficult discussions to drive inclusive growth and break barriers smallholder farmers face in mainstream value chains.

The baselines serve as outputs and provide recommendations based on the assessment of the respective industry. However, the report's relevance as a measure of progress and its impact on developing smallholder farmers will largely depend on the actions of the industry, government, farmers, and other relevant stakeholders. The outcomes stage catalyses the actual report and the desired broader impact.

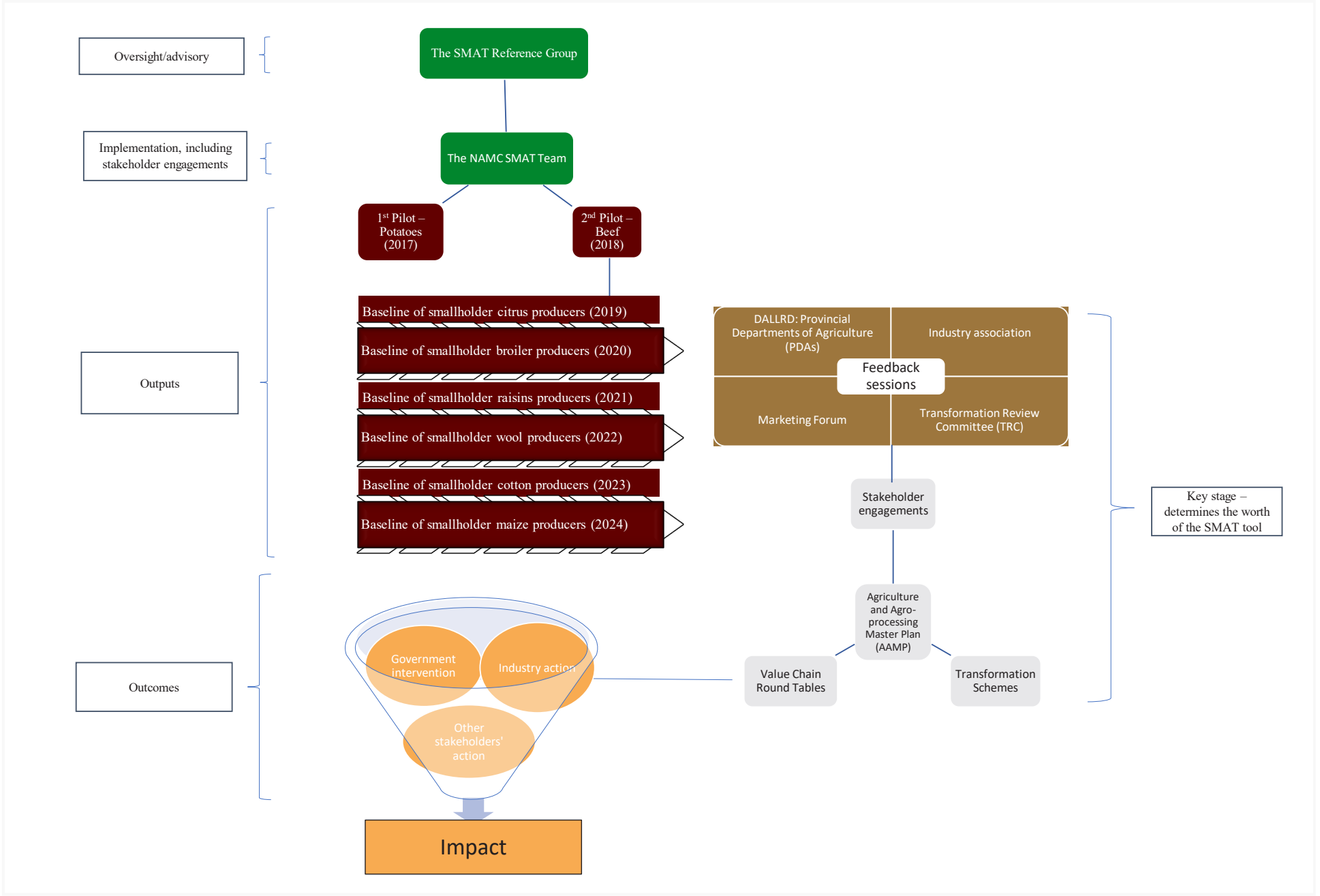

Figure 1: The SMAT process
Source: Adapted from the SMAT report (2019)

1.4 Maize baseline: sampling and data collection procedure

The maize baseline has been in the pipeline since 2021. However, arrangements to meet with farmers progressed slowly. Consequently, it was preceded by baselines for the wool and cotton sectors. Grain South Africa and the provincial agricultural departments provided data on the number of smallholder maize growers. The latter's low participation resulted in little information about Mpumalanga, Gauteng, the Eastern Cape, the Free State, and the North West provinces. The information obtained by March 2023 included 4,470 farmers from seven provinces, excluding the Northern Cape and Western Cape.

Singh & Masuku (2014) determined a representative sample of 354 farmers with a 5% margin of error. From September 2023 to March 2024, data was collected using the purposive sampling approach from six provinces, except for the Northern Cape, Western Cape, and Free State, yielding 388 responses. The Free State was eliminated due to difficulties in scheduling meetings with farmers. After cleaning the data, 332 responses were retained and used in the study, meaning that the confidence level in the data's representativeness dropped slightly by 0.18%, but the margin of error remained less than 10% at 5.18%. Farmers accounting for 56 of the difference in responses were eliminated due to:

- Selling green mealies
- Sending grain to the miller in exchange for maize meal
- Consuming 100% of their produce and not selling it
- Providing incomplete information
- Earning a farm income of R7 million or more

SECTION 2:

OVERVIEW OF THE MAIZE INDUSTRY

SECTION 2: OVERVIEW OF THE MAIZE INDUSTRY

2.1 Introduction

This section presents an overview of the maize industry by briefly indicating production, production areas, marketing channels, supply, demand, and prices. It begins by sharing the global overview and zooms down to the domestic industry overview.

2.2 Production

The global maize industry, which serves as the foundation of global food security, has faced significant challenges in recent years. Geopolitical tensions, such as the ongoing war in Ukraine, have disrupted supply chains and resulted in soaring prices, as evidenced by the record highs of the Food and Agriculture Organization (FAO) Food Price Index in early 2022 (FAO, 2024). Unpredictable weather conditions further complicate the maize market, adding another layer of uncertainty. However, the Black Sea Grain Initiative, launched in July 2022, has played a crucial role in stabilizing the disruptions caused by geopolitical tensions (UN, 2023). This initiative has enabled Ukraine, a significant maize producer, to resume exports through its Black Sea ports. Although the ongoing war continues to impact Ukraine's production capacity, the deal has facilitated the export of existing stockpiles, easing global supply constraints. Nonetheless, the short-term nature of the agreement casts uncertainty on the region's future stability.

Zooming out to the broader picture, global agricultural production, including maize, has demonstrated impressive growth. Between 2000 and 2021, production increased by 54%, catering to human and animal consumption and the growing demand for biofuels and industrial products. In these developments, the Americas have maintained their dominance in maize production. The United States and Brazil, as the leading maize producers, contributed nearly 39% of global production in 2021, as illustrated in **Figure 2**. China follows, accounting for almost 23% of global maize production. Brazil ranks third with 136 million metric tonnes, driven by extensive agricultural areas and favourable climates. The European Union (EU) is fourth, followed by Argentina and Ukraine, which produce 58.8, 55, and 31.5 million tonnes, respectively. Mexico, South Africa, Russia, and Canada complete the top ten, contributing significantly to global supply but to a lesser extent than the top producers.

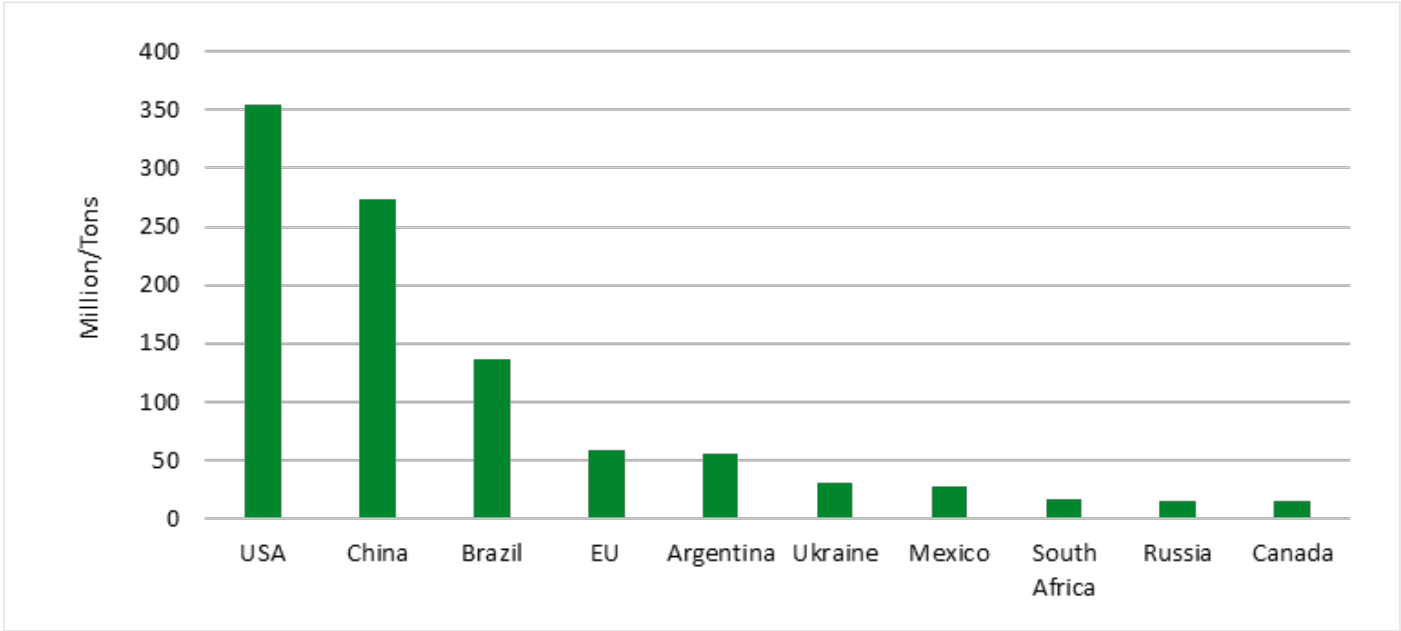

Figure 2: Top ten maize-producing countries, 2022/23
Source: FAO, 2023

The South African maize market has matured considerably since the deregulation of agricultural marketing. Producers, traders, and other intermediaries interact freely in the marketing of maize. Most of the maize produced in South Africa is consumed locally, making the domestic market significant to the industry. This positions South Africa as the eighth-largest corn-producing country in the world. Maize is the most widely cultivated field crop and a crucial staple in South Africa.

Furthermore, the industrial sector relies heavily on maize as a raw material for starch, glucose, and dextrose production. Maize also plays a critical role in the livestock feed industry, contributing significantly to meat and dairy production. The yellow maize variety holds significant value in livestock feed production. **Table 2** depicts the production of white and yellow maize across various provinces from the 2014/15 to the 2022/23 seasons.

Table 2: White and yellow maize production

White Maize Production ('000 t)									
Province	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Free State	2236	1190.5	5110	3350	2795	4700	4492	3801.9	4446
Northwest	1046	816	2599	1670	1274	2196	2130	2047.5	2188.8
Mpumalanga	824	752	1088	812	797.5	872	1100.5	1072.5	1032.9
Gauteng	193.6	207	390	275	259.2	297	371.2	361.6	364
Kwazulu-Natal	224	215	350	280	270	298.4	310	322.4	298.9
Limpopo	156.75	178	300	90	83.2	105	112.2	102.3	114.24
Eastern Cape	15.6	10	30.8	21.7	23	35.2	39	40.8	40.25
Northern Cape	35	35	46.2	41.3	39.5	40.3	40.3	36	12.5
Western Cape	4.05	5	2	0	3.6	3.6	4.8	4.75	2.375
Total	**7710.00**	**4735.00**	**3408.50**	**9916.00**	**6540.00**	**5545.00**	**8547.50**	**8600.00**	**7789.75**
Yellow Maize Production ('000 t)									
Province	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Free State	1708.5	1023	2252	1925	1758	2209	2542	2547.2	2686.7
Mpumalanga	1605.3	1567	2342.5	2005	1977.3	2347.5	2820	2537.5	2587.2
Northern Cape	644	675	666	628	630.75	633.9	627.3	672	696
Northwest	444	325	561	428.55	399	522	556	554.6	590
Kwazulu-Natal	283.5	307	390	380	399.6	434.5	451	489.7	533
Gauteng	292.5	235	414	356.5	348	330	380	403.2	390
Eastern Cape	84	66	66.5	71.5	69.75	119	133.2	157.85	192.5
Limpopo	124	132	192	141.7	117	126	172.2	202.5	186.96
Eastern Cape	34.2	40	20	33.75	30.6	30.6	33.3	32.9	32.9
Total	**5220.00**	**4370.00**	**6904.00**	**5970.00**	**5730.00**	**6752.50**	**7715.00**	**7597.45**	**789526**

Source: Grain SA, 2024

The data from **Table 2** indicates that the production of white and yellow maize has fluctuated significantly over the years. White maize production peaked at nearly 10 million tonnes in 2017/18, followed by a decline and a subsequent recovery in 2020/21, with over 8.5 million tonnes produced. However, a slight decrease occurred in 2022/23 (approximately 7.8 million tonnes). The Free State province has consistently led in white maize production, followed by the North West and Mpumalanga provinces, contributing significantly to the national total. Conversely, the production of yellow maize has exhibited a more consistent upward trend, with a significant increase from approximately 5.2 million tonnes in 2014/15 to almost 7.9 million tonnes in 2022/23. The Free State and Mpumalanga provinces are the foremost producers of yellow maize.

The cultivation of white and yellow maize in South Africa predominantly relies on dryland farming, with only a small portion of the crop being grown under irrigation. Consequently, the El Niño phenomenon significantly influences maize production in the country, frequently resulting in drought conditions and consequent yield reductions (DALRRD, 2016). Empirical evidence supports the notion that discernible patterns align with periods of El Niño activity. For instance, during the 2015/16 growing season, an intense El Niño event precipitated a severe drought, adversely affecting maize production in key growing provinces such as the Free State, North West, and Mpumalanga. Similarly, the 2019/20 season experienced a decline in white maize production related to El Niño-like conditions. Although not as severe as the drought of 2015/16, these conditions still resulted in reduced yields in certain provinces. The Crop Estimates Committee (CEC) expects a 13% year-on-year decline in the 2023/24 summer grains and oilseed harvest, estimating it at 17.4 million tonnes (SAGIS, 2024). This decrease is due to lower expected yields rather than reduced planting area. The impact of El Niño on maize production underscores the vulnerability of South Africa's agricultural sector to climate variability.

2.3 Production areas

Maize is cultivated throughout the country. Looking at maize production areas from 1990/91 to 2022/23 reveals distinct patterns in the distribution of planting across provinces. Averaging the data over this period provides a comprehensive view of the long-term trends in maize cultivation. **Figure 3** shows that the Free State is the largest contributor to maize production, with the average area planted being 682.3 thousand hectares for white maize and 417.8 thousand hectares for yellow maize. The North West province follows, with an average of 672.0 thousand hectares for white maize and 227.9 thousand hectares for yellow maize.

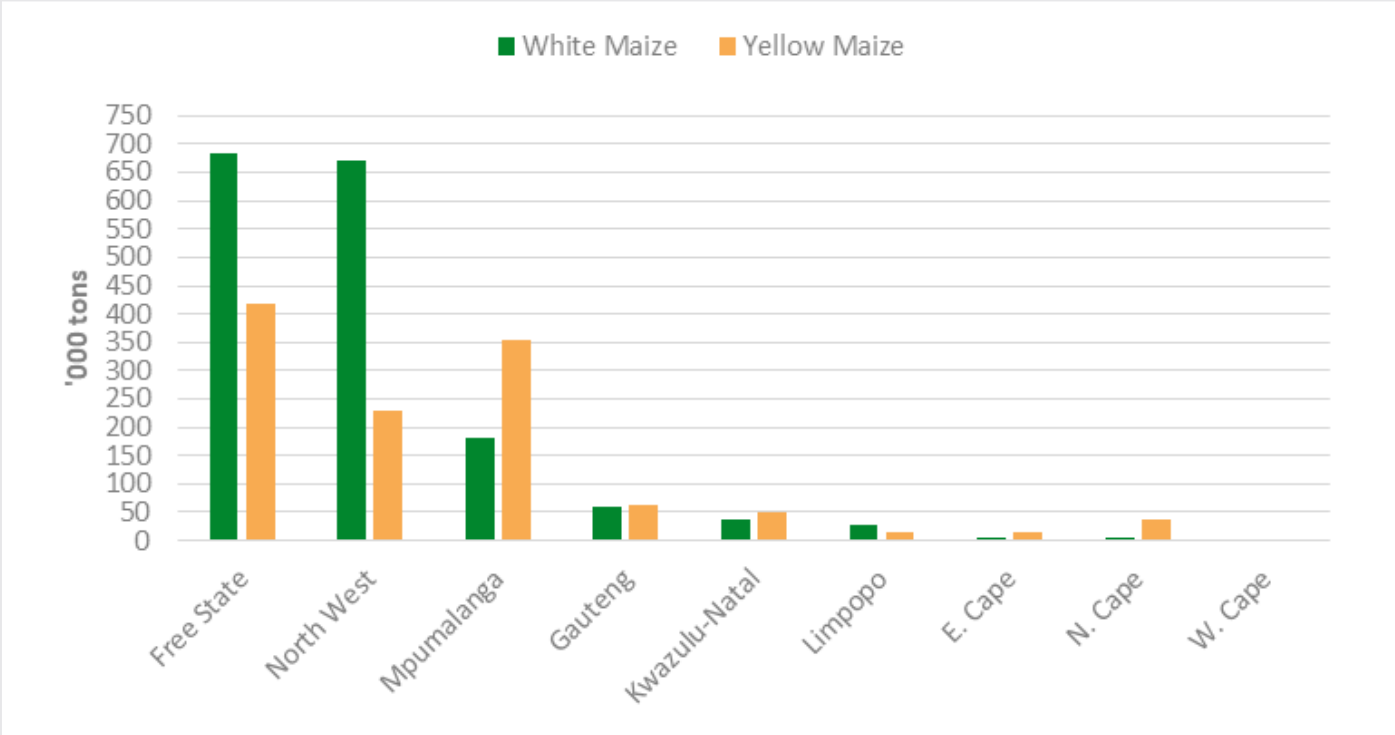

Figure 3: Average area planted for white and yellow maize
Source: SAGIS, 2024

Although smaller in size compared to the Free State and North West, Mpumalanga has an average area planted of 181.9 thousand hectares for white maize and 355.5 thousand hectares for yellow maize. These three provinces account for approximately 88.9% of the area planted for maize. In contrast, provinces such as Gauteng (4%), KwaZulu-Natal (3%), Limpopo (1.5%), Eastern Cape (1%), Northern Cape (1%), and Western Cape (0.1%) have smaller average areas planted for maize. Approximately 83% of the production areas are dryland, and the remaining areas are under irrigation.

2.4 Marketing channels

The marketing of maize in South Africa is dynamic, with various channels such as crop sales, storage, and future contracts available (GrainSA, 2022). The cash market offers a direct and uncomplicated solution for maize producers seeking immediate sales. Farmers can sell their crops directly to buyers, including local millers, cooperatives, grain traders, and other interested parties. The product's versatility allows the sale of unprocessed or milled maize in bags or bulk. Payment is made upon delivery, and prices fluctuate according to local supply and demand. Farmers are advised to stay informed about current South African Futures Exchange prices to navigate this system effectively (SAGIS, 2024).

Storage presents an alternative strategy for maize producers with significant potential benefits. This approach involves retaining harvested maize instead of selling it immediately. Farmers can store grain on their farms, provided they have the necessary facilities, or use storage services offered by nearby cooperatives for a fee. This strategy is desirable when market prices are low, allowing farmers to hold onto their stock and later capitalise on potential price increases. However, the success of storage hinges on a confluence of factors. Farmers need knowledge of crop estimates and price forecasts to make informed decisions. They must also consider storage and transportation costs, which can significantly impact profitability.

Furthermore, the concept of interest plays a crucial role. The primary cost associated with storing grain is the lost opportunity cost, which represents the potential returns that could have been earned by investing the money elsewhere. Alternatively, if storage is financed through borrowing, the interest on the loan becomes an actual cost.

Forward contracts offer a distinct advantage for maize producers, enabling them to secure a selling price for their crops even before harvest (Sayed & Auret, 2020). This method caters to buyers like millers, cooperatives, feedlots, and exporters who require guaranteed quantities of maize to meet their operational needs. These buyers offer forward contracts to secure specific volumes, with the contract price subject to daily adjustments based on market fluctuations. Regardless of the prevailing market price on harvest day, the farmer receives the agreed-upon contract price, providing a degree of security and predictability that can instil confidence. However, it is crucial for farmers to meticulously examine the specifics of each contract offered by different buyers (JSE, 2022). Key considerations include the base price, the required quantity and quality (with potential price premiums for exceeding quality standards), the agreed-upon delivery details encompassing date, location, and payment method, and the consequences of failing to meet the stipulated contract specifications. More information on agricultural derivatives contract specialisation can be accessed on the Johannesburg Stock Exchange client portal (JSE, 2022).

2.5 Supply and demand

The South African maize market is characterised by a dynamic interplay between production, consumption, exports, and imports, as evidenced by the data provided for the marketing seasons between 2014/15 and 2023/24. **Figure 4** shows relative stability in maize consumption within the country, with minor fluctuations around the 10-to-11-million-tonne range. Such stability implies consistent domestic demand for maize, likely driven by its status as a staple food in South Africa. In the country, an average of 81% of maize is processed for human use, animal feed, and industrial purposes. However, it is noteworthy that in some years, such as 2016/17 and 2019/20, consumption exceeded producer deliveries, necessitating imports to meet the shortfall. The need for imports highlights a potential vulnerability in the domestic market's ability to rely solely on local production to meet demand, underscoring the crucial role of trade relationships and import strategies. Imports of maize into South Africa have been relatively low compared to exports, with some years showing no imports. Low import levels indicate that domestic production has generally been able to meet local demand.

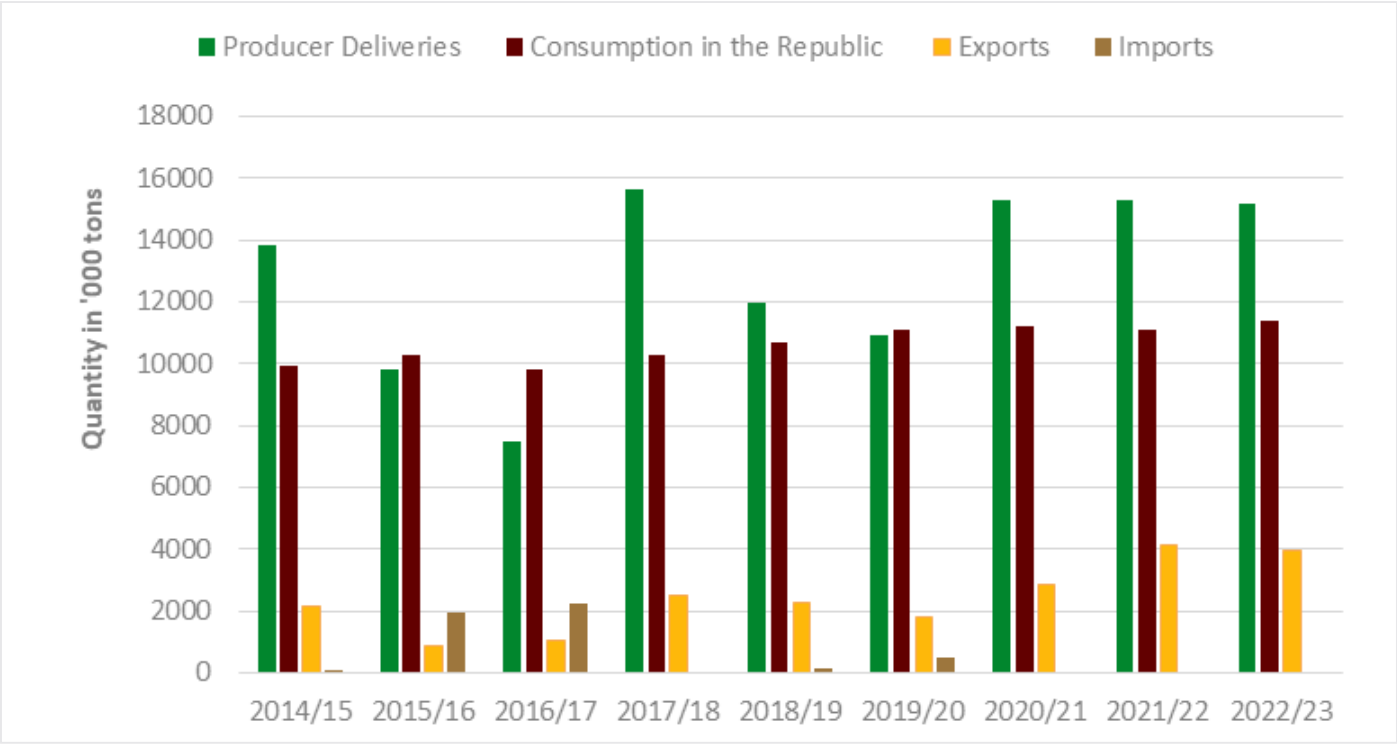

Figure 4: Supply and demand of maize in South Africa
Source: SAGIS (2024)

Furthermore, the data reveals that South Africa exports more maize than it imports, with shipment volumes varying considerably across marketing seasons. Exports service about 18% of total demand, on average. The highest export volume was recorded in 2017/18, reflecting favourable production conditions and strong international demand. However, export volumes have shown volatility, which can be attributed to factors such as global market conditions, exchange rates, and competitor countries' production levels. The ability to export surplus maize is a significant economic driver for South Africa, contributing to foreign exchange earnings and supporting the growth of the agricultural sector.

The data reveals fluctuations in farmer deliveries over the years, with factors such as weather conditions, input costs, and technology adoption likely influencing these trends in output. For instance, the decline in producer deliveries in 2016/17 may be attributed to adverse droughts. Conversely, the gradual increase in deliveries in the following years indicates a recovery and potential growth in production capacity. However, the decline in producer deliveries in the most recent 2023/24 season raises concerns and warrants further investigation into the underlying causes

2.6 Global trade patterns of maize

A decrease in global coarse grain exchange is predicted for 2023–2024 (July–June) compared to 2022–2023. The decline is primarily due to an expected drop in maize and barley trade, with a less significant decrease for barley. The European Union's anticipated reduction in import demand and the continued disruptions from the war in Ukraine have led to reduced maize shipments from that country, contributing to a decline in global maize trade. Brazil is expected to continue as the top exporter of maize globally for a second season.

According to a five-year baseline projection of grain supply and demand by the International Grains Council (IGC, 2024), maize trade is forecasted to increase by 2% annually to new levels at least until 2025/26 (see **Figure 5**). The forecasted growth in maize trade is mainly underpinned by the growing demand for animal feed, primarily from developing countries. Additionally, the increase will be driven by adequate exportable supplies, which could result in deliveries to most regions reaching record levels.

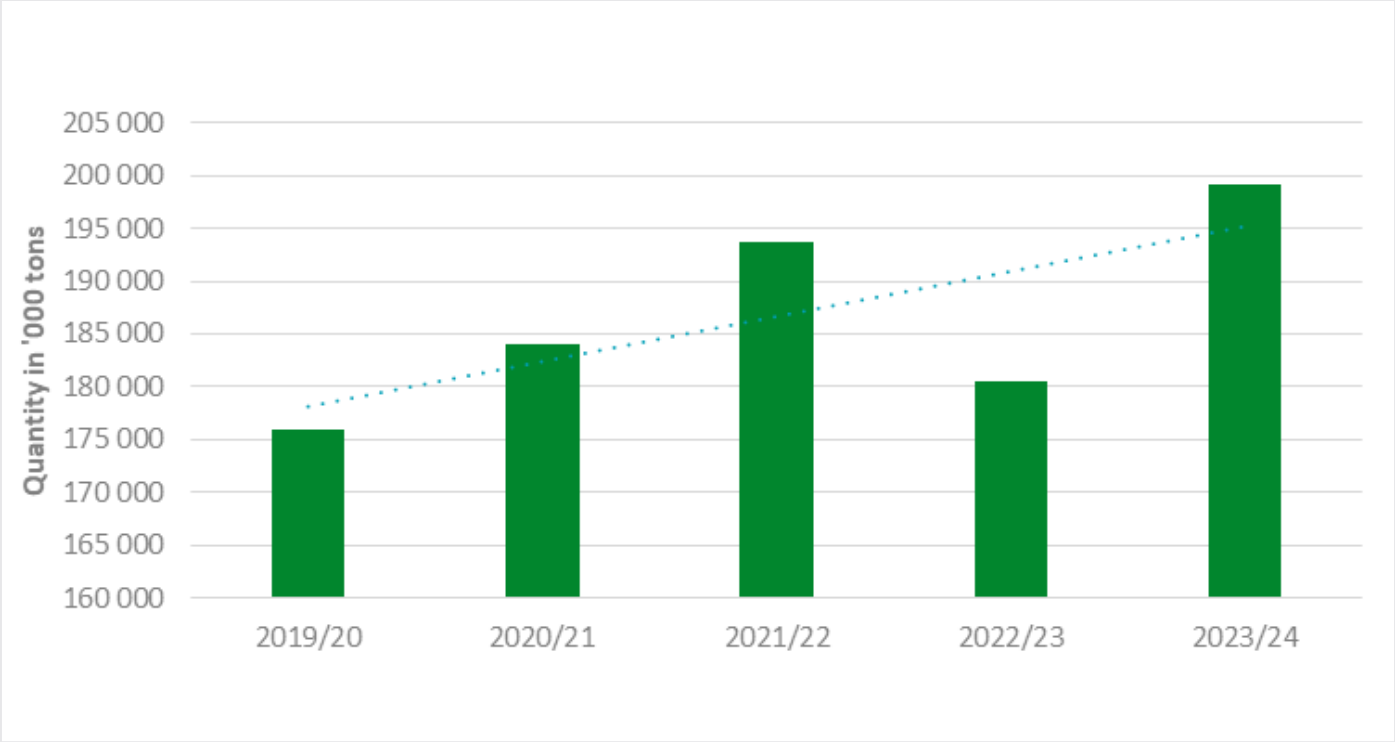

Figure 5: Trade volume of maize worldwide from 2016/17 to 2023/24
Source: Statista, 2024, USDA, 2024

Figure 5 illustrates the global trade volumes of maize from the 2019/20 season to the 2023/24 season forecast. The results show that global maize trade has followed an increasing trend pattern over the past five years. Over this period, global maize trade increased by approximately 13%, from 175.8 billion metric tonnes (MT) in the 2019/20 season to a forecast of about 199.1 billion MT in the 2023/24 season. However, there was a sudden decline in worldwide maize exchange by 7%, from 193.6 billion MT in the 2021/22 season to about 180.5 billion MT in the 2022/23 season.

The IGC (2024) reckons that, in some instances, feed grains may compete. On the other hand, increasing meat imports may result in limited feed imports in regions such as Pacific Asia and Sub-Saharan Africa (SSA). Additionally, notwithstanding the forecasted competition from alternative feeds, the European Union (EU) will likely remain the world's major importer of maize, followed by Mexico. Data from the United States Department of Agriculture Foreign Agricultural Service (USDA, 2024) estimates show that Brazil remains the largest exporter of maize, accounting for a 30% share of global maize trade, followed by Argentina (17%), Ukraine (11%), Russia (3%), and the European Union (EU) (2%). On the other hand, the EU and China are currently the leading importers of maize worldwide. Both the EU and China are set to account for about 12% of global maize imports in the current 2023/24 season, followed by Mexico (10%), Japan (8%), and South Korea (6%).

2.7 Maize prices

Global maize prices have been influenced by various factors, leading to fluctuations in the market. According to the United Nations Food and Agriculture Organization (FAO), key coarse grain prices were 25% lower in October 2023 than the previous month, attributed to a rebound in global supplies during the season (FAO, 2023). **Figure 6** illustrates the international maize price trend from 2000 to 2023. Between 2014 and 2020, global maize prices trended lower due to bumper harvests. However, in 2020, prices increased due to persistent drought conditions in high-exporting South American countries like Argentina and Brazil. The war in Ukraine in 2022 further escalated global grain prices, including maize. After 2022, maize prices started to decline due to good harvests and lower logistics costs, offsetting the effects of challenges in inland logistics. Maize prices are forecasted at 240 USD in 2024, lower than the average prices in 2022 and 2023. From 2000 to 2023, global maize prices increased by 185%, from 88 USD/tonne to 252 USD/tonne. On a year-on-year basis, a tonne of maize globally, on average, was selling 20.7% lower in 2023. This decline follows significant improvements in global supply chains, weather conditions, and lower fertiliser prices, among other factors.

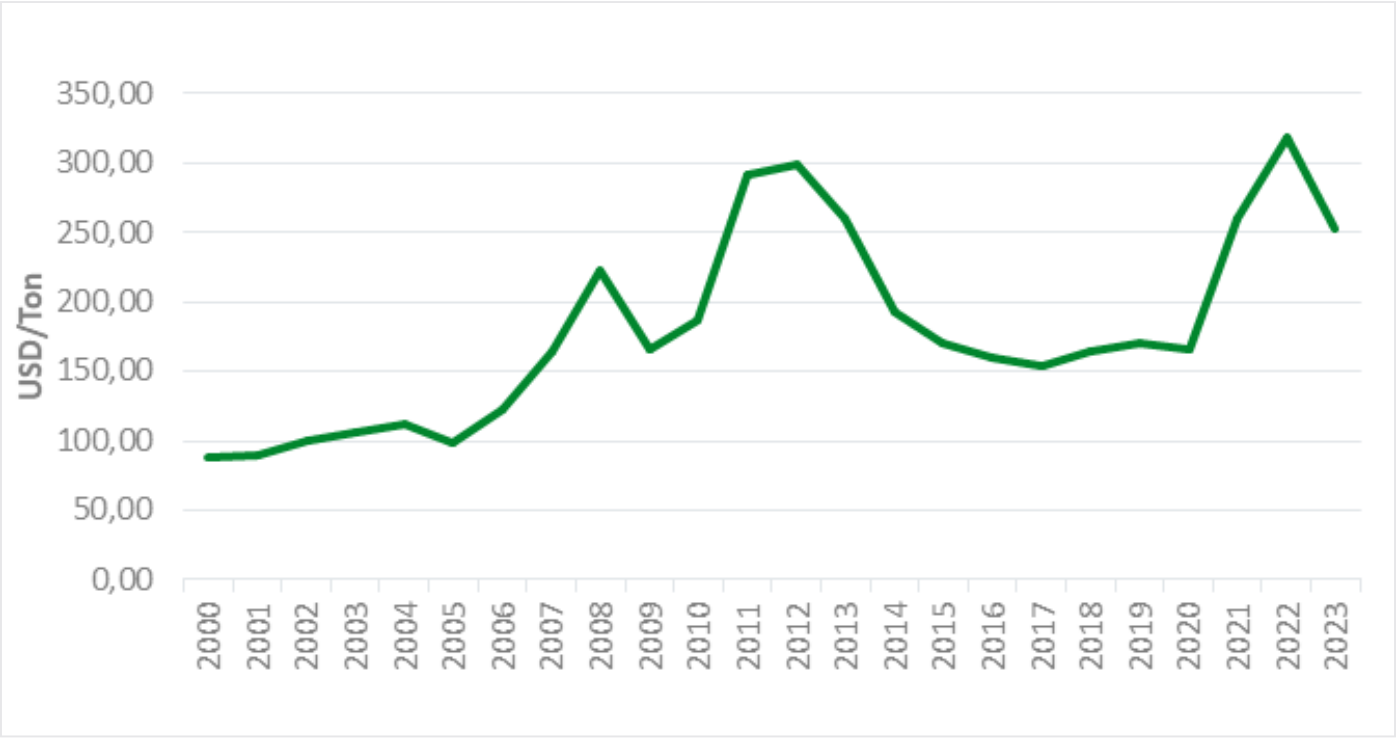

Figure 6: **Global maize prices**
Source: FAO, 2023

In South Africa, white and yellow maize prices have shown an overall increasing trend over the years, albeit with some fluctuations. **Figure 7** indicates that during the 2010/11 season, the producer prices for white and yellow maize were relatively low, at about R900 per tonne. The moderate supply of maize in the local market during that season was more than enough to meet the annual local consumption requirements, causing lower prices. A dramatic increase in producer prices followed, reaching the highest levels during the 2015/16 production season, mainly due to a decrease in the total supply of maize in the market owing to the dry season.

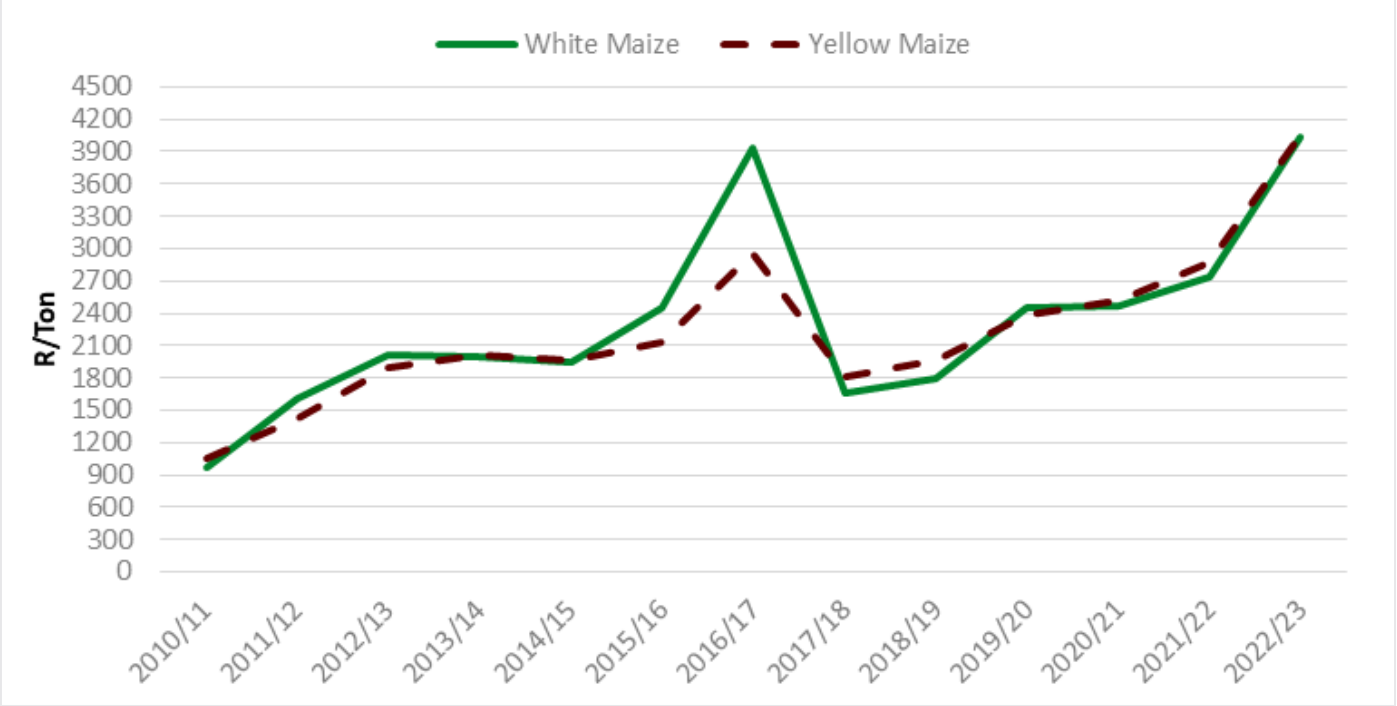

Figure 7: **Global maize prices**
Source: FAO, 2023

The consistent disparity between white and yellow maize prices is significant, with white maize generally recording higher prices due to its primary use for human consumption. In contrast, yellow maize is mainly used for animal feed. The period in question concluded with increased producer prices for white maize (R4 039.61 per tonne) and yellow maize (R4 053.61 per tonne). In South Africa, maize prices are chiefly influenced by the principles of supply and demand, with 75% of the crop being consumed domestically. Favourable yields result in lower prices, while droughts or low yields lead to higher prices due to augmented demand. International market dynamics also play a role, with imports during shortages affecting local prices. Export demand can stabilise prices, but global trade regulations also play a crucial role. Moreover, transportation and fuel costs impact prices, as maize production necessitates transportation from farms to markets

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SECTION 3:

MAIZE BASELINE SURVEY RESULTS

SECTION 3: MAIZE BASELINE SURVEY RESULTS

This section presents the findings of the key SMAT indicators on farmers' profiles, production, marketing, and insurance. As stated in Section 1, the research considered 332 responses from six provinces. Farmers' production scales vary, with some having only one hectare and others having 680 hectares. As a result, farmers were classified based on the size of their plots of land. **Figure 8** shows the proportion of farmers in each category. Notably, the classifications are not based on statistical research or evidence of differences. They were based solely on the exact number of hectares provided by the farmers. For example, the second category starts with 5.3 hectares, while the third starts with 120 hectares rather than 5.1 or 101 hectares. Most farmers (59.3%) can access one to five hectares, whereas the minority (4.8%) have 400 to 680 hectares. There was little difference in representation across the other three categories.

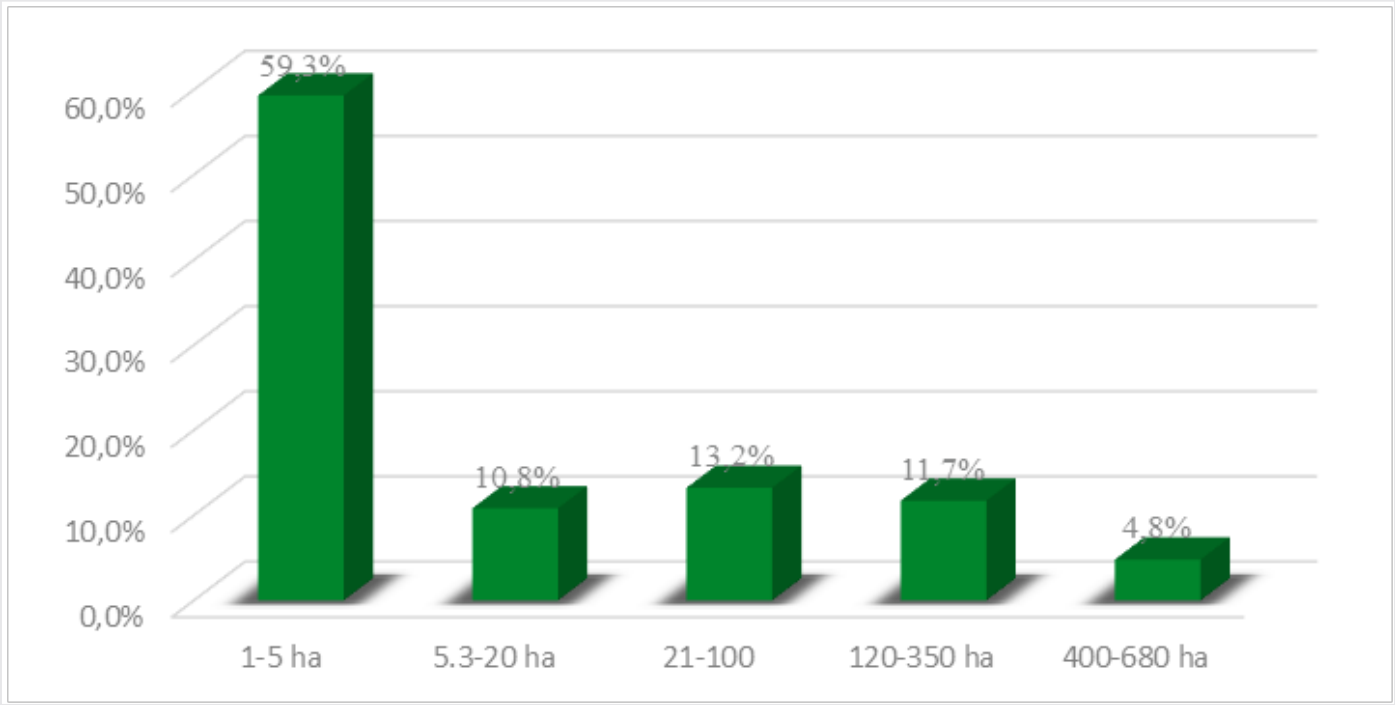

Figure 8: Farmers categorised by their access to land
Source: Survey data

3.1 Demographic information

Table 3 presents demographic data for smallholder maize farmers, including age, gender, education, primary source of income, and farm business legal status. The findings reveal that a typical smallholder maize farmer is a 58-year-old male who is fairly educated, with the majority (62%) having completed secondary and tertiary education. The youngest mean age, 49, is observed among farmers in the 120–350-hectare category. The low mean age in this category implies limited participation of youth in smallholder maize farming.

The education level of smallholder maize farmers paints a promising picture for the industry. In other words, farmers are equipped to seek, acquire, process, interpret, and analyse the information necessary for their farming endeavours, as proposed by Ellis (1998). Female farmers lead the 1–5-hectare group (57%), whereas male farmers dominate the remaining categories by up to three-quarters. The majority (51%) of farmers in the 1–5-hectare category has primary education or less, whereas most in other categories have secondary or higher education. In the 400–680-hectare category, none of the farmers have primary education, while 75% have tertiary education.

The majority of farmers (64%) stated that farming is their primary source of income, with social handouts (15%) and pensions (12%) ranking second and third. Other businesses were indicated as the primary source of income for 6% of the studied farmers, while remittances were identified by a minority (3%). Farmers in the 400-680-hectare category rely exclusively on farming and other businesses to make a living.

There were only three legal entity statuses for smallholder maize farmers. Sole proprietorship, the most common legal entity status among 64% of farmers, refers to a non-registered farming operation operated by an individual. Farmers who have registered private farms or operate as cooperatives led the 5.3-20-, 21-100-, and 120–350-hectare categories, with a combined proportion of more than 50% in each.

Table 3: Summary of demographic characteristics presented in percentages

Variable	Category	Group of farmers categorised by land size					Total
		1-5 ha	5.3-20 ha	21-100 ha	120-350 ha	400-680 ha	
Age is measured by the number of years (standard deviation)		60 (13.6)	55 (16.4)	57 (11.7)	49 (12.9)	56 (12.8)	58 (14.1)
Gender	Female	113 (57%)	14 (40%)	6 (14%)	15 (38%)	4 (25%)	152 (46%)
	Male	85 (43%)	21 (60%)	38 (86%)	24 (62%)	12 (75%)	180 (54%)
Education	Primary or less	100 (51%)	12 (34%)	11 (25%)	2 (5%)	0	125 (38%)
	Secondary School	76 (38%)	12 (34%)	14 (32%)	23 (59%)	4 (25%)	129 (39%)
	Tertiary education	22 (11%)	11 (32%)	19 (43%)	14 (36%)	12 (75%)	78 (23%)
The main source of livelihood	Farming	116 (59%)	17 (49%)	35 (80%)	30 (77%)	14 (88%)	212 (64%)
	Other business	7 (3%)	6 (17%)	3 (7%)	2 (5%)	2 (12%)	20 (6%)
	Pension	28 (14%)	5 (14%)	5 (11%)	3 (8%)	0	41 (12%)
	Remittances	8 (4%)	0	0	0	0	8 (3%)
	Social grant	39 (20%)	1 (2%)	1 (2%)	4 (10%)	0	51 (15%)
Legal status	Cooperative	42 (21%)	15 (43%)	27 (61%)	12 (31%)	3 (19%)	99 (30%)
	Pty Ltd	2 (1%)	4 (11%)	2 (5%)	8 (20%)	4 (25%)	20 (6%)
	Sole proprietor	154 (78%)	16 (46%)	15 (34%)	19 (49%)	9 (56%)	213 (64%)

Source: Survey data

3.2 Farming profile

Table 4 presents an aggregate summary of production indicators, comparing farmers from different provinces within and between the land size categories. The findings demonstrate that farmers in the 1–5-hectare category produce more maize in the Eastern Cape than their counterparts in other provinces. These farmers produce 7.1 tonnes of maize, more than doubling the output of other provinces except for Mpumalanga, which produces 6.9 tonnes. Farmers in the Eastern Cape and KwaZulu-Natal produce more yellow maize than in other provinces. Farm income follows a similar trend, with the Eastern Cape leading, followed by Mpumalanga. However, farmers in this category typically lose money because their expenses are larger than their income. The expenses include labour, pesticides, weed control, fertilisers, hiring implements, transport, loan repayment, seed, and packaging. One explanation is that they consume a greater proportion of what they produce than farmers in other categories. Farmers in the Eastern Cape are the least profitable, with a loss of R5 510, followed by Mpumalanga (-R3 670), North West (-R2 765), and KwaZulu-Natal (-R1 883). Limpopo was the only profitable province, with R1 850. Despite farming at a loss, producers in this category employ two to four workers during a specific period of the production season. On average, the farmers have at least nine years of maize farming experience.

In the 5.3-20-hectare category, the Eastern Cape produces the most maize, with 38.9 tonnes, followed by the North West (25 tonnes), KwaZulu-Natal (22 tonnes), and Mpumalanga (21.3 tonnes). Limpopo produces fewer than 20 tonnes. Farmers in the Eastern Cape, North West, and KwaZulu-Natal produce more yellow maize than in other regions. Farm income is more than quadruple that of farmers with 1-5 hectares, with the Eastern Cape more than double the income in all provinces except the North West. All other provinces are profitable since their expenses are lower than their income, except for KwaZulu-Natal, which has a loss of R64 216. The Eastern Cape was the most profitable, earning R50 879, followed by the North West (R36 000), Mpumalanga (R34 931), and Limpopo (R26 871). The North West has the highest average price per tonne at R4 000, followed by the Eastern Cape (R3 127 per tonne), Mpumalanga (R2 918 per tonne), Limpopo (R2 838 per tonne), and KwaZulu-Natal. Farmers in this category have at least ten years of maize farming experience.

In the 21–100-hectare category, Gauteng produces the most maize (203.3 tonnes), followed by the North West (184.5 tonnes), KwaZulu-Natal (127.2 tonnes), Eastern Cape (85.4 tonnes), and Limpopo (50.0 tonnes). The Limpopo province has the biggest proportion of farmers producing white maize, whereas the other provinces predominantly grow yellow maize. All provinces are profitable. The Eastern Cape and North West have twice as many job opportunities as the 5.3-20-hectare category, while KwaZulu-Natal has the same number, and Limpopo has fewer. Farmers have at least 7.5 years of maize farming experience, which is lower on average than the previous two categories. However, farmers in Limpopo and the North West have more years of maize farming experience than those in the prior two categories. On average, production is higher in the 120–350-hectare category, with KwaZulu-Natal yielding 1 073 tonnes and Limpopo producing the least (0.7 tonnes) of any farmer in all categories. The Eastern Cape and KwaZulu-Natal have the highest share of farmers producing yellow maize, whereas other provinces grow white maize. Besides Limpopo, farm revenue and profitability have increased, although work prospects have remained relatively stable. Farm income hits one million Rand, with KwaZulu-Natal nearly triple that of other provinces. On average, farming experience exceeds that of the prior category.

In the Eastern Cape and North West, production in the 400-680-hectare category is, on average, lower than in the previous category. It increases marginally in KwaZulu-Natal but more than doubles in Gauteng. Farm income also reduces but remains at R1 million or higher in all provinces except Gauteng, where it reaches R2.01 million. Expenses in Gauteng reached R1.44 million, although farmers remained profitable, as in other provinces. Employment prospects are declining in the Eastern Cape but expanding in other provinces compared with the preceding category. Except for the North West, which produces white maize, most farmers in this category grow yellow maize.

While not explicitly visualised, it is crucial to highlight the challenges mentioned by farmers, which include high input costs, theft of produce, stray animals, pests and weeds, drought, and a lack of machinery, implements, and storage. The lack of storage is particularly problematic, as it forces farmers to sell as soon as they harvest, regardless of market prices. Farmers believe that having storage would allow them to study and track market trends. They feel they waste their produce since they do not make much money by selling immediately after harvest. For them, keeping their produce at home is even more wasteful due to inadequate storage space and capacity, which quickly degrades the quality of their goods.

NB: The number in parentheses is the standard deviation (SD). A larger SD suggests that the data points are sparsely distributed far from the mean and vice versa.

Table 4: Summary of production indicators by province and farm size (n = 332)

Farmers categorized by land size	Variables	Units	Eastern Cape	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West
1 – 5 ha	Production	tons	7.1 (6.0)	-	3.5 (3.4)	2.9 (3.4)	6.9 (5.8)	1.3 (1.8)
	White maize	% share	0%	-	49%	93%	52%	77%
	Yellow maize	% share	100%	-	51%	7%	48%	23%
	Farm income (n=100)	R/year	17 062 (15996)		6 916 (10390)	9 112 (9704)	12 762 (14549)	2 977 (5760)
	Labour	N	4.0 (3.9)		2.0 (3.3)	3 (3.5)	3 (5.5)	2 (1.9)
	Expenses	R/year	22 572 (14868)		8 799 (7290)	7 262 (8370)	16 432 (11901)	5 742 (4670)
	Maize farming experience	Years	18.4 (16.5)		22.7 (17.2)	17.8 (15.4)	9.9 (6.7)	14.0 (12.2)
5.3 – 20 ha	Production	tons	38.9 (23.4)	-	22 (20.4)	16.0 (10.8)	21.3 (24.8)	25.0 (0)
	White maize	% share	0%	-	23%	84%	82%	0%
	Yellow maize	% share	100%	-	77%	16%	18%	100%
	Farm income	R/year	121 666 (94339)		20 000 (8660)	45 415 (38804)	62 166 (76282)	100 000 (0)
	Labour	N	9.0 (7.6)		7.0 (3.1)	6 (10.8)	4 (2.1)	2 (0)
	Expenses	R/year	70 787 (78650)		84 216 (132817)	18 544 (21945)	27 235 (6329)	64 000 (0)
	Maize farming experience	Years	10.0 (8.8)		25.7 (22.0)	20.8 (15.1)	27.3 (11.2)	15.0 (0)
21 – 100 ha	Production	tons	85.4 (78.1)	203.3 (236.3)	127.2 (141.4)	50.0 (14.1)	-	184.5 (210.7)
	White maize	% share	0%	13%	6%	100%	-	31%
	Yellow maize	% share	100%	87%	94%	0%	-	69%
	Farm income	R/year	252 540 (261711)	439 333 (362824)	463 357 (586159)	165 000 (21213)		409 363 (583688)
	Labour	N	18.6 (13.2)	6 (7.8)	7.0 (8.8)	5 (0.7)		4 (5.2)
	Expenses	R/year	165 121 (229753)	76 503 (94215)	176 250 (103015)	73 400 (18950)		148 980 (114105)
	Maize farming experience	Years	7.5 (5.9)	21.0 (6.2)	9.7 (6.2)	27.5 (31.8)		15.9 (11.0)
120 – 350 ha	Production	tons	302.9 (395.6)	441.7 (374.4)	1073 (39.8)	0.7 (0)	-	351.3 (369.9)
	White maize	% share	7%	99%	0%	100%	-	73%
	Yellow maize	% share	93%	1%	100%	0%	-	27%
	Farm income	R/year	1.04 m (1493938)	1.31 m (1336960)	3.0 m (1907878)	5 600 (0)		1.26 m (1304103)
	Labour	N	16.0 (10.5)	6.0 (0.6)	6.0 (5.1)	5 (0)		7 (6.5)
	Expenses	R/year	831 670 (755657)	519 782 (90652)	249 166 (133658)	4 300 (0)		378 249 (374897)
	Maize farming experience	Years	12.9 (7.3)	23.7 (27.6)	15.3 (12.9)	40.0 (0)		16.2 (10.6)

Farmers categorized by land size	Variables	Units	Eastern Cape	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West
400 – 680 ha	Production	tons	289.0 (209.8)	930.0 (240.4)	1200.0 (0)	-	-	307.5
	White maize	% share	4%	0%	0%	-	-	77%
	Yellow maize	% share	96%	100%	100%	-	-	23%
	Farm income	R/year	1.07 m (941286)	2.01 m (1400071)	1.0 m (0)			1.0 m (1367871)
	Labour	N	11.0 (7.8)	9.0 (2.1)	20.0 (0)			9 (14)
	Expenses	R/year	708 616 (639952)	1.44 m (645022)	246 500 (0)			812 883 (875401)
	Maize farming experience	Years	19.3 (11.2)	3.5 (2.1)	8.0 (0)			20.2 (18.6)

Figure 9 compares expenses for specific items by province. The findings suggest that most farmers in Gauteng province had greater expenses for numerous selected goods than other provinces. The cause of this discrepancy can be traced back to Gauteng's smaller sample size compared to other provinces. Fertiliser is often more expensive, costing R138 344 in the North West province, R93 297 in the Eastern Cape, and R86 339 in Gauteng. Seed is similarly expensive, costing R215 076 in Gauteng, R76 454 in the Eastern Cape, and R51 972 in the North West Province. Weed control, pesticides, hiring equipment, and labour are all substantial contributors to expenses, and transportation is also a significant cost component in maize marketing. Gauteng, the North West, and the Eastern Cape bear the highest costs for almost all the selected items.

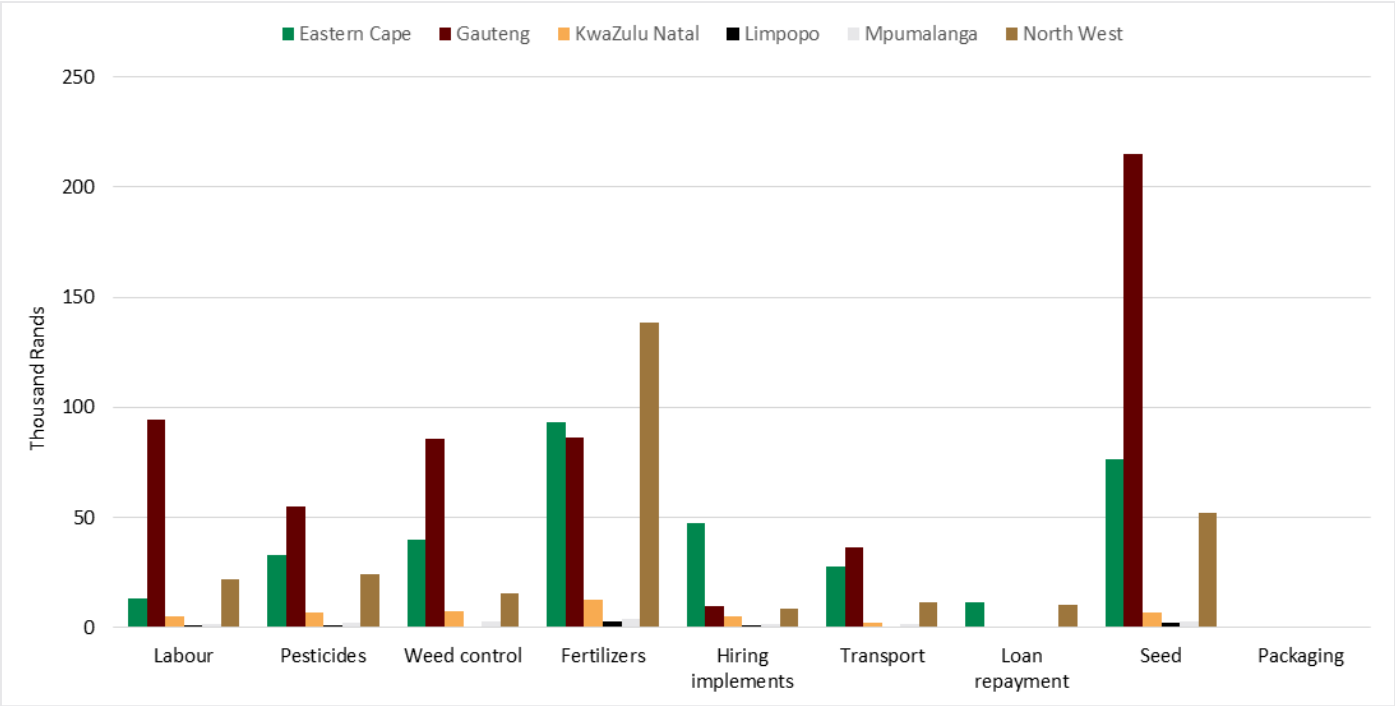

Figure 9: Average cost per item by province
Source: Survey data

3.2.1 Access to land and ownership

Land is a fundamental resource in agricultural production. **Figure 10** presents the land ownership status. The farmers were asked about private ownership of the land they used. The results indicate that the ownership status of many farmers (55%) across all categories is permission to occupy. Some farmers rely mainly on informal arrangements, borrowing unutilised land from friends, family, and neighbours within their communities. Others are land reform beneficiaries without formal secure tenure. Some farmers (26%) have secured land rights through a title deed, while others (16%) have lease agreements. The remaining 3% include farmers who inherited the land but might not have formal private ownership rights.

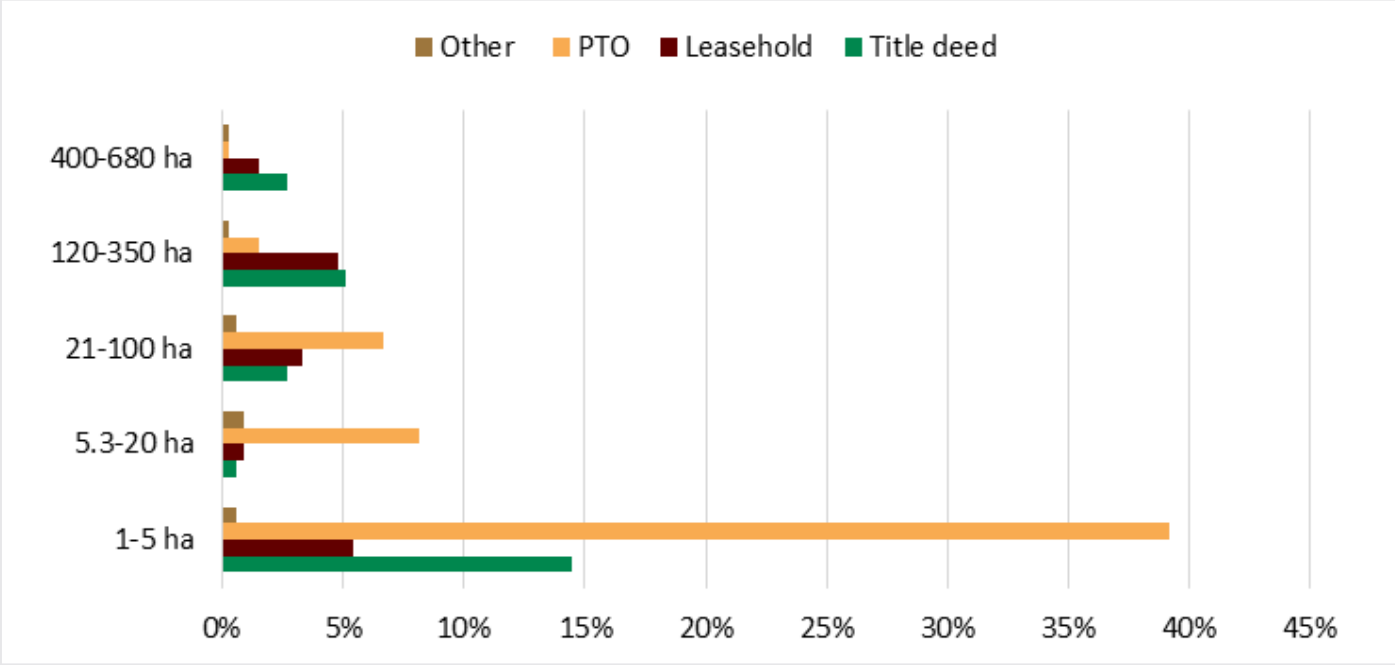

Figure 10: Summary of land ownership
Source: Survey data

3.2.2 Access to credit

Although not visualised, 55 farmers (16% of the sample) reported borrowing money for farming. Many of them (33%) fell under the 1–5-hectare category, followed by the 120–350-hectare (29%) and 21–100-hectare (22%) categories. The 400–680-hectare category accounted for only 7% of farmers, with the remaining 9% falling in the 5.3-20-hectare category. **Figure 11** presents the various sources of borrowed funds, the proportion of farmers who use each source, and the size of the farmers in terms of their land size. The results show that farmers under the 1–5-hectare category borrowed money from various sources but mainly used the Land Bank (16%), followed by fellow farmers and 'other' sources, including development finance institutions, family members, and informal money lenders, both represented by 7%. Only 2% of farmers in this category borrowed money from other commercial banks. Farmers in the 120–350-hectare category mainly borrowed money from 'other' sources (18%), followed by fellow farmers (7%), with 2% each borrowing from the Land Bank and other commercial banks. Farmers under the 21–100-hectare category mainly borrowed money from 'other' sources (7%), followed by those who borrowed from fellow farmers and other commercial banks (5% each). Only 4% of farmers in this category borrowed money from the Land Bank. Farmers in the 5.3-20-hectare category borrowed money from three sources, mainly from fellow farmers (5%) and 2% borrowed from the Land Bank and other commercial banks. Farmers borrowed money from only two sources in the 400–680-hectare category: other commercial banks (5%) and fellow farmers (2%).

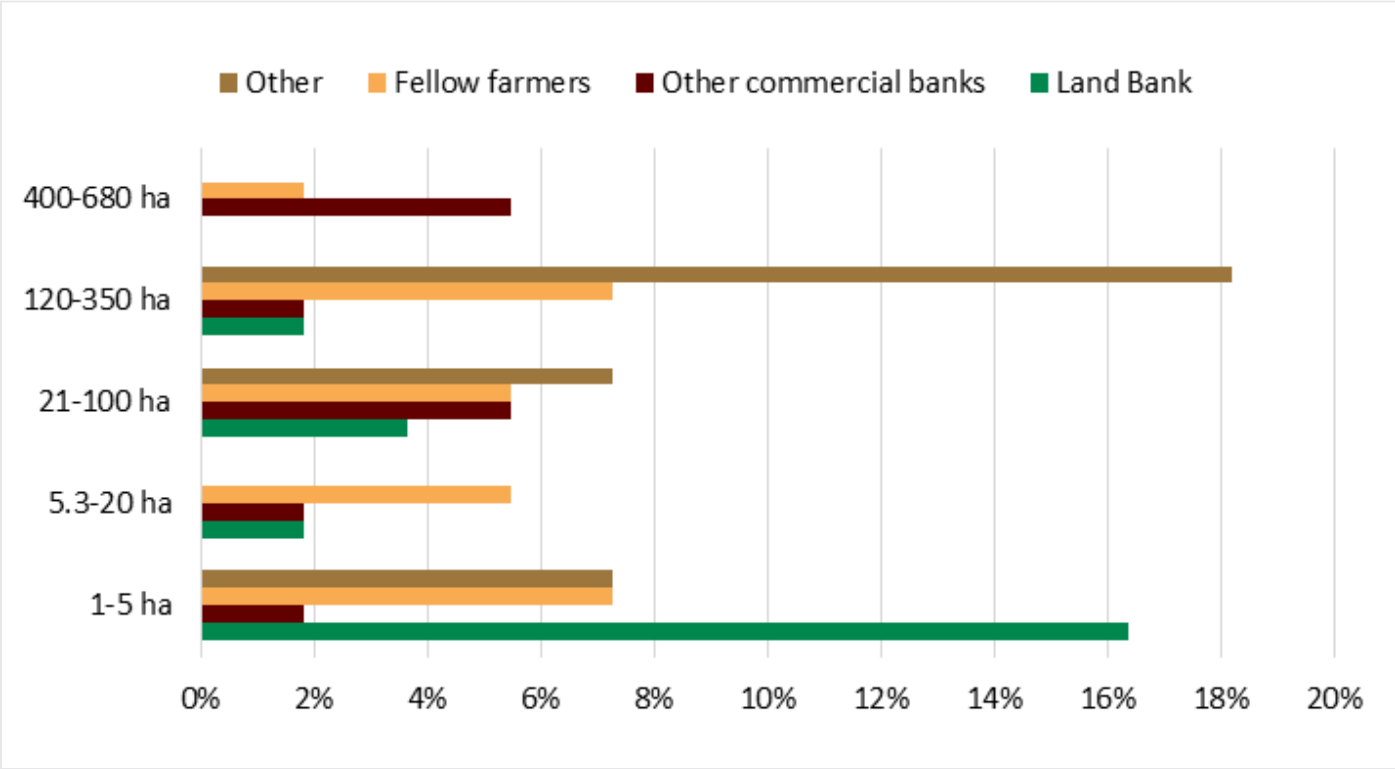

Figure 11: Status of access to credit
Source: Survey data

3.2.3 Crop rotation

Farmers were asked if they practised crop rotation. This practice has costs and may also have yield implications, as it is known to diversify soil nutrient composition and pest and weed pressures while reducing potential pest and weed resistance. Of the sampled farmers, 214 (64%) practised crop rotation. **Figure 12** presents the results, indicating that the majority (38%) of these farmers are in the Limpopo province, followed by North West (25%), KwaZulu-Natal (15%), Mpumalanga (10%), Eastern Cape (8%), and Gauteng (4%). Although not visualised, farmers who practised crop rotation rotated maize with other grains, such as sunflower, beans, wheat, groundnuts, oats, canola and soybeans, as well as vegetables like potatoes, sweet potatoes, butternut, beetroot, tomatoes, garlic, spinach, cabbage, peppadews, baby marrows, okra, chillies, green peppers and onions.

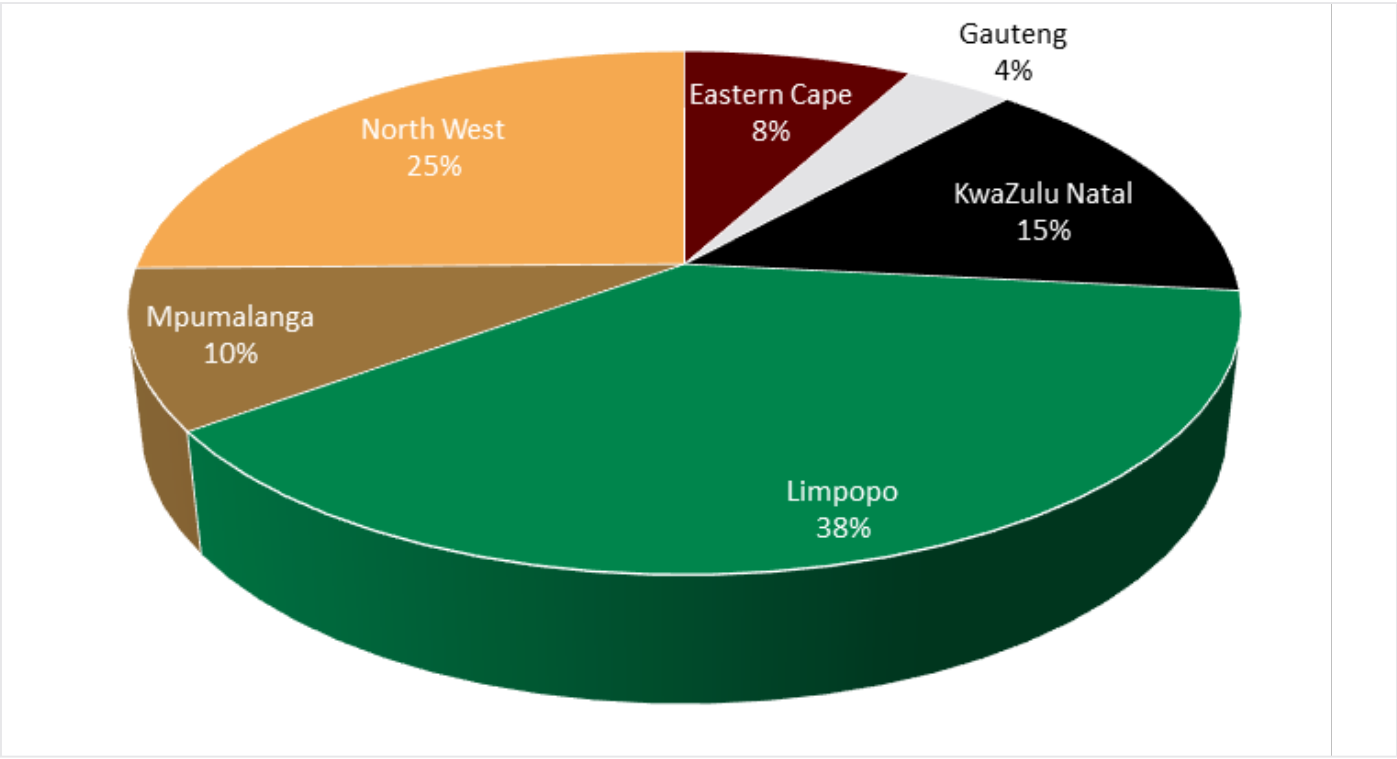

Figure 12: Share of farmers who practise crop rotation
Source: Survey data

3.3 Market access

This subsection focuses on the marketing channels supplied by farmers. The analysed channels included millers, animal feed manufacturers, wholesalers, retailers, silos, other farmers, households in neighbouring communities and 'other' channels. 'Other' included feedlots, piggeries and chicken farms. Notably, hawkers fell under the category of households within neighbouring communities. Farmers were given the option to select multiple channels they supplied, allowing for multiple responses. The analysis is based on row totals for both frequencies and percentages.

Table 5 summarises the markets supplied and compares farmers across the six studied provinces. On average, 316 farmers reported supplying markets, with the majority in Limpopo (37%), followed by KwaZulu-Natal (19%), North West (18%), Eastern Cape (12%), Mpumalanga (10%), and Gauteng (3%). Households in neighbouring communities ranked second, supplied by 180 farmers, the majority (41%) of whom are from Limpopo, followed by KwaZulu-Natal (28%), Eastern Cape (21%), North West (7%), and Mpumalanga (3%). Millers trailed households, supplied by 76 farmers, most of whom were in Limpopo (47%) and the fewest in the Eastern Cape (8%), with no farmers supplying millers in the North West province. Seventy (70) farmers supplied silos, with 63% from the North West, 16% from Mpumalanga, 7% from Limpopo, 6% from Gauteng, 4% from the Eastern Cape, and 4% from KwaZulu-Natal.

Other farmers ranked as the fifth market, supplied by 42 farmers, followed by 'other' markets (32 farmers), wholesalers (29 farmers), and animal feed manufacturers (16 farmers), which had the fewest number of farmers supplying them. Although farmers in each province supply different markets, every province appears to have a predilection that sets it apart.

For example, 62% of farmers in the Eastern Cape supply a single market (wholesalers) compared to other provinces, 63% supply silos in the North West, 56% supply animal feed manufacturers in KwaZulu-Natal, 47% supply millers in Limpopo, 23% supply millers in Mpumalanga, and 13% supply wholesalers in Gauteng.

However, when analysing column totals by province, retailers (32%) and households in neighbouring areas (31%) are the most popular markets in the Eastern Cape, accounting for 63% of the total, compared to 37% spread across six markets.

In Gauteng, retailers (38%) and millers (23%) account for 61%; in KwaZulu-Natal, retailers (39%) and households in neighbouring communities (32%) account for 71%; in Limpopo, retailers (44%) and households in neighbouring communities (28%) account for 72%; in Mpumalanga, retailers (45%) and millers (24%) account for 69%; and in the North West province, retailers (47%) and silos (37%) account for 84%.

Table 5: Marketing channels used by the province

Marketing channels	Eastern Cape		Gauteng		Kwa-Zulu Natal		Limpopo		Mpumalanga		North West	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Millers	6	7.9	5	6.6	11	14.5	36	47.4	18	23.7	0	0.0
Animal feed manufacturers	3	18.8	0	0.0	9	56.3	0	0.0	4	25.0	0	0.0
Wholesalers	18	62.1	4	13.8	4	13.8	0	0.0	3	10.3	0	0.0
Retailers	39	12.3	8	2.5	61	19.3	118	37.3	34	10.8	56	17.7
Silos	3	4.3	4	5.7	3	4.3	5	7.1	11	15.7	44	62.9
Other farmers	12	28.6	0	0.0	10	23.8	16	38.1	0	0.0	4	9.5
Households in the neighbouring communities	38	21.1	0	0.0	50	27.8	74	41.1	5	2.8	13	7.2
Other	3	9.4	0	0.0	9	28.1	17	53.1	0	0.0	3	9.4

Source: Survey data

Figure 13 presents the payment arrangements for the different marketing channels used by the farmers. The results show that all farmers who sell to bakkie traders (100%) and small buyers (56.25%) get paid immediately. The payment arrangements with small buyers can also vary, with some farmers (25%) indicating that they get paid after 2 to 3 months, 12.5% between 2 weeks and one month, and 6.25% more than three months. The majority (53.49%) of farmers who sell their produce to brokers were paid between two weeks and three months, with 23.26% receiving payment within the first month and 20.93% after more than three months. Two farmers (1.16%) indicated that the brokers paid them immediately or after a week; there could have been a misunderstanding regarding how the question was posed.

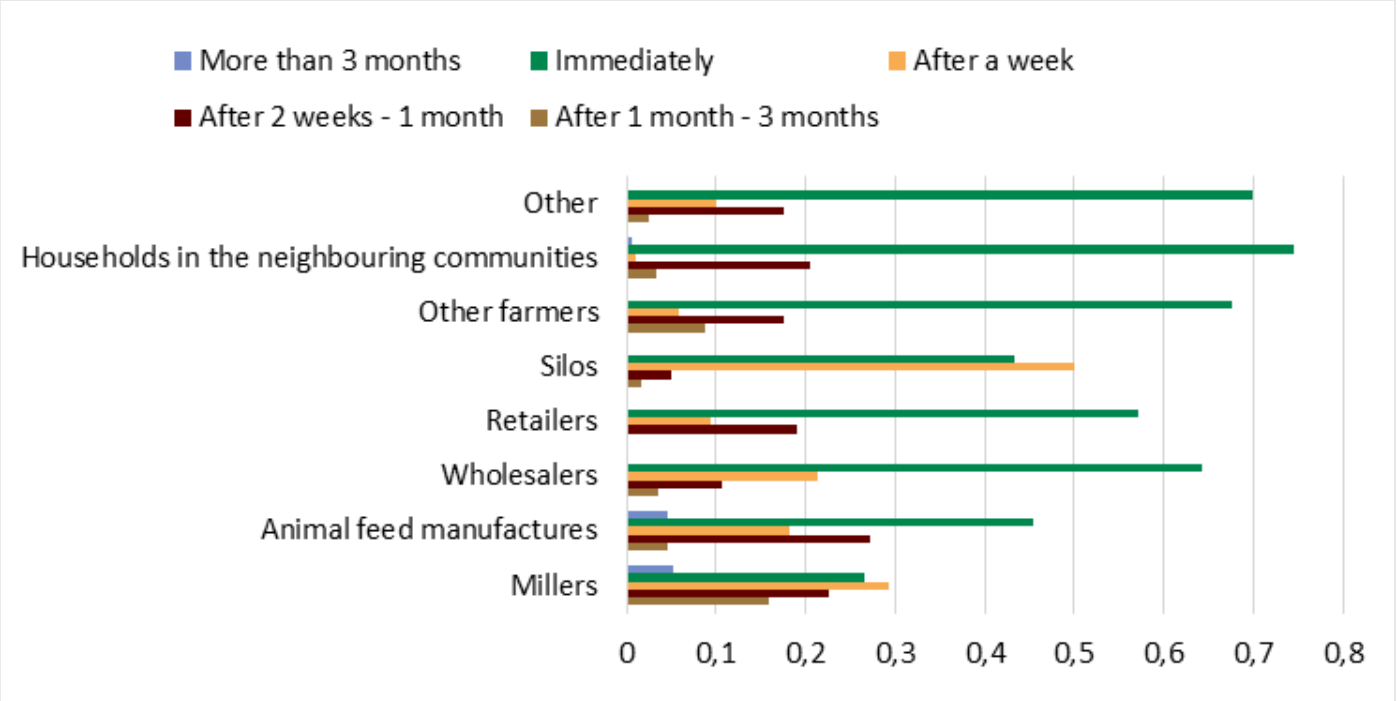

Figure 13: Payment arrangements
Source: Survey data

Figure 14 shows the percentage of farmers who use their transport to deliver maize to the market. The largest proportion is those who supply households in neighbouring communities (30%), followed by those selling to silos (21%), millers (15%), wholesalers (9%), other farmers (8%), "other" and animal feed manufacturers (6% each), and retailers (5%). Farmers did not use their own transport in the following circumstances:

- The market collects the product from the farm and charges the farmer (mainly retailers, wholesalers, and "other" markets).
- The market collects the product at its own cost (mainly households in neighbouring communities).
- Farmers hire transport to deliver the product (all markets).

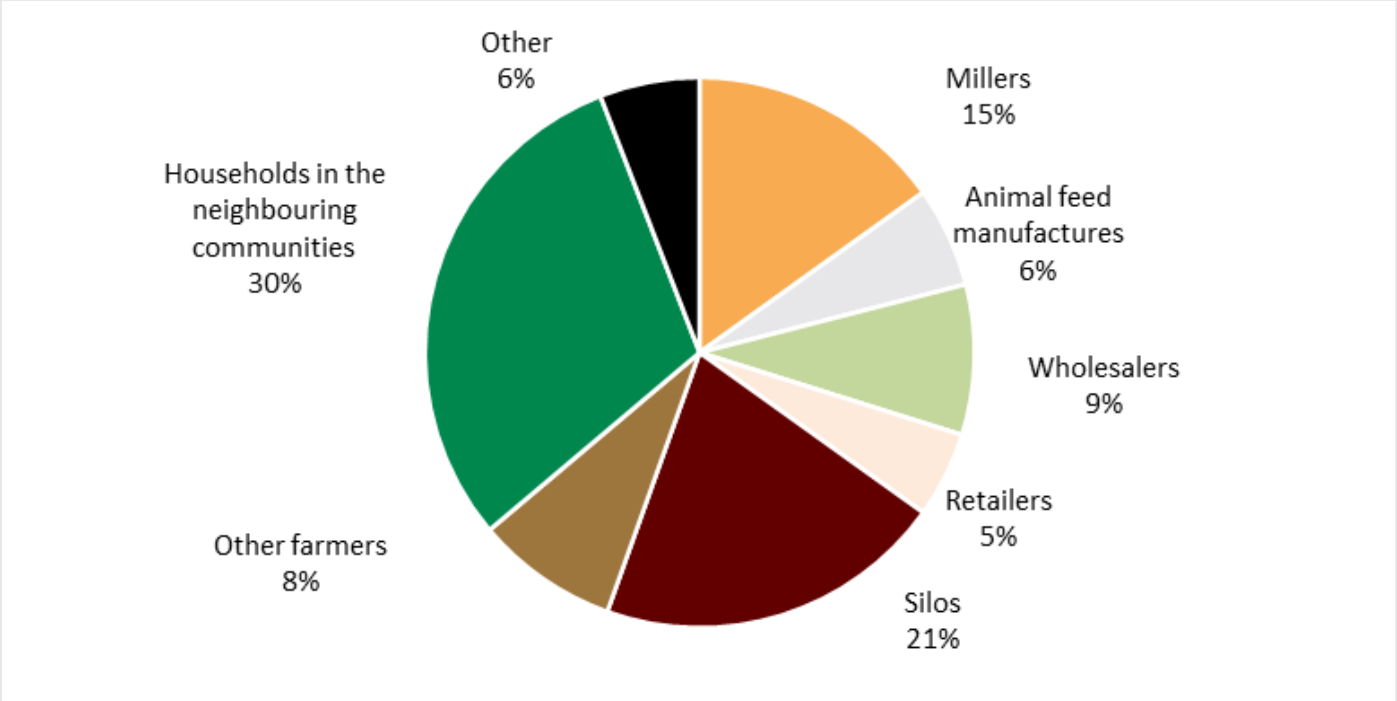

Figure 14: Logistics arrangements
Source: Survey data

3.3.1 Perceptions of the marketing channel

The study used four indicators to rate farmers' perceptions and experiences of the market: fairness[5], accessibility[6], safety[7], and convenience[8]. The rating was based on a scale of 1–4 for each indicator, where 1 = very poor, 2 = poor, 3 = good, and 4 = excellent. **Table 6** presents the results and compares the perceptions for each market by province. On average, millers received a 'poor' rating for fairness, attributed to low ratings in the Eastern Cape, Limpopo, Mpumalanga, and North West provinces, whereas Gauteng and KwaZulu-Natal gave 'good' ratings. Accessibility, safety, and convenience received 'good' ratings on average.

Only the North West rated accessibility as 'poor', while all other provinces ranked it as 'good'. The same applied to safety. The convenience ratings from Eastern Cape, Mpumalanga, and North West were 'poor', whereas those from Gauteng, KwaZulu-Natal, and Limpopo were 'good'.

On average, animal feed manufacturers received a 'good' rating across all aspects, with notable strengths in fairness (North West and Mpumalanga), accessibility (KwaZulu-Natal, Mpumalanga, and North West), safety (Eastern Cape, KwaZulu-Natal, Mpumalanga, and North West), and convenience (Eastern Cape, KwaZulu-Natal, Mpumalanga, and North West). These positive ratings offset the 'poor' ratings from other provinces.

Wholesalers received a 'good' rating on average in all aspects, with KwaZulu-Natal giving the only 'poor' rating for fairness. Gauteng province consistently rated all aspects as 'good'.

Retailers obtained a 'good' rating in all aspects except fairness, which KwaZulu-Natal and North West rated as 'poor' and 'very poor'. KwaZulu-Natal, Mpumalanga, and the North West also gave 'poor' ratings in other aspects, including accessibility, safety, and convenience.

On average, silos were rated 'good' in three areas (accessibility, safety, and convenience) but 'poor' in fairness. The Eastern Cape was the only province with a 'poor' rating for accessibility. In the KwaZulu-Natal province, both safety and convenience were rated as 'poor', while in Limpopo, only convenience received this rating. The Limpopo, Mpumalanga, and North West provinces contributed to the overall 'poor' rating for fairness.

Other farmers received 'good' ratings in three key areas: fairness (in the Eastern Cape, KwaZulu-Natal, Mpumalanga, and North West), accessibility (consistent across all provinces), and safety (with all provinces except the Eastern Cape achieving a 'good' rating).

The overall 'poor' rating for convenience is due to 'poor' ratings in Gauteng, KwaZulu-Natal, Limpopo, and the North West.

Neighbouring communities' households have been rated as 'good' in all aspects. However, Gauteng province's households received a 'very poor' rating on fairness, an 'excellent' rating on accessibility, and 'poor' ratings on safety and convenience. In addition to Gauteng, the Eastern Cape rated safety as 'poor', while the North West received a 'poor' rating for convenience. The remaining provinces gave a 'good' rating in all aspects.

[5] Fairness refers to the transparency of the market, particularly regarding grading and standards followed by the price received by the producer.

[6] Accessibility refers to the ease of market participation and is based on barriers to entry that often hinder smallholder farmers from engaging in high-value markets. Barriers considered in the context of this baseline include stringent market requirements such as certification and good farm practices.

[7] Safety refers to the conditions in which the produce is moved and incidents of robbery or theft. It takes into account the suitability of the modes of transport and the extent of security of the produce as it moves from the producer to the buyer.

[8] Convenience refers to the extent to which farmers can deliver their produce to the market on time, considering transport, distance, and roads.

Table 6: Farmers' perception of the markets

Rating of millers				
Province	**Fairness**	**Accessibility**	**Safety**	**Convenience**
Eastern Cape	1.8	2.6	2.6	2.2
Gauteng	3.0	2.5	3.0	2.5
KwaZulu-Natal	2.5	2.6	2.7	2.7
Limpopo	2.3	2.8	2.8	2.7
Mpumalanga	2.1	2.7	2.9	2.3
North West	2.0	2.0	2.0	2.0
Total	**2.3**	**2.7**	**2.8**	**2.5**
Rating of animal feed manufacturers				
Eastern Cape	2.4	2.4	2.6	2.6
KwaZulu-Natal	2.0	2.7	2.9	2.7
Limpopo	2.0	2.0	2.0	2.0
Mpumalanga	2.7	2.7	2.7	2.7
North West	3.0	3.0	3.0	3.0
Total	2.6	2.6	2.7	2.7
Rating of wholesalers				
Eastern Cape	2.5	2.7	3.0	2.7
Gauteng	4.0	4.0	4.0	4.0
KwaZulu-Natal	2.4	2.8	2.8	3.0
Mpumalanga	2.5	2.8	3.0	2.8
North West	3.0	3.0	3.0	3.0
Total	2.6	2.8	3.0	2.8
Rating of retailers				
Eastern Cape	2.5	2.8	2.5	2.7
Gauteng	3.0	3.0	3.0	3.0
KwaZulu-Natal	2.3	2.3	2.8	2.3
Mpumalanga	1.0	2.0	4.0	4.0
North West	2.0	2.3	2.0	3.0
Total	**2.4**	**2.6**	**2.6**	**2.7**

Rating of silos				
Province	**Fairness**	**Accessibility**	**Safety**	**Convenience**
Eastern Cape	2.6	2.4	2.6	2.8
Gauteng	2.8	3.3	2.5	2.5
KwaZulu-Natal	2.5	2.5	2.0	2.0
Limpopo	2.3	3.0	3.0	2.3
Mpumalanga	2.1	2.6	2.6	2.8
North West	2.1	2.9	3.0	2.7
Total	2.2	2.8	2.8	2.7
Rating of other farmers				
Province	Fairness	Accessibility	Safety	Convenience
Eastern Cape	3.0	3.0	2.4	2.7
Gauteng	2.0	3.0	3.0	2.0
KwaZulu-Natal	2.6	2.6	2.5	2.4
Limpopo	2.1	2.9	2.8	2.2
Mpumalanga	3.0	2.5	3.0	2.5
North West	2.8	2.8	2.8	2.4
Total	2.6	2.8	2.6	2.4
Rating of households in the neighbouring communities				
Province	Fairness	Accessibility	Safety	Convenience
Eastern Cape	2.8	2.7	2.1	2.7
Gauteng	1.0	4.0	2.0	2.0
KwaZulu-Natal	2.7	2.8	2.9	2.8
Limpopo	2.8	2.9	2.9	2.7
Mpumalanga	3.1	3	3.3	3.0
North West	2.6	2.7	2.6	2.1
Total	2.8	2.8	2.7	2.7

Source: Survey data

3.4 Access to marketing services and facilities

This subsection indicates the facilities and services that farmers may access to enhance their ability to enter markets for their produce. The results in **Figure 15** show that apart from the Maize Trust's assistance in Mpumalanga, most farmers in each province lack access to marketing information, services, facilities, implements, and support.

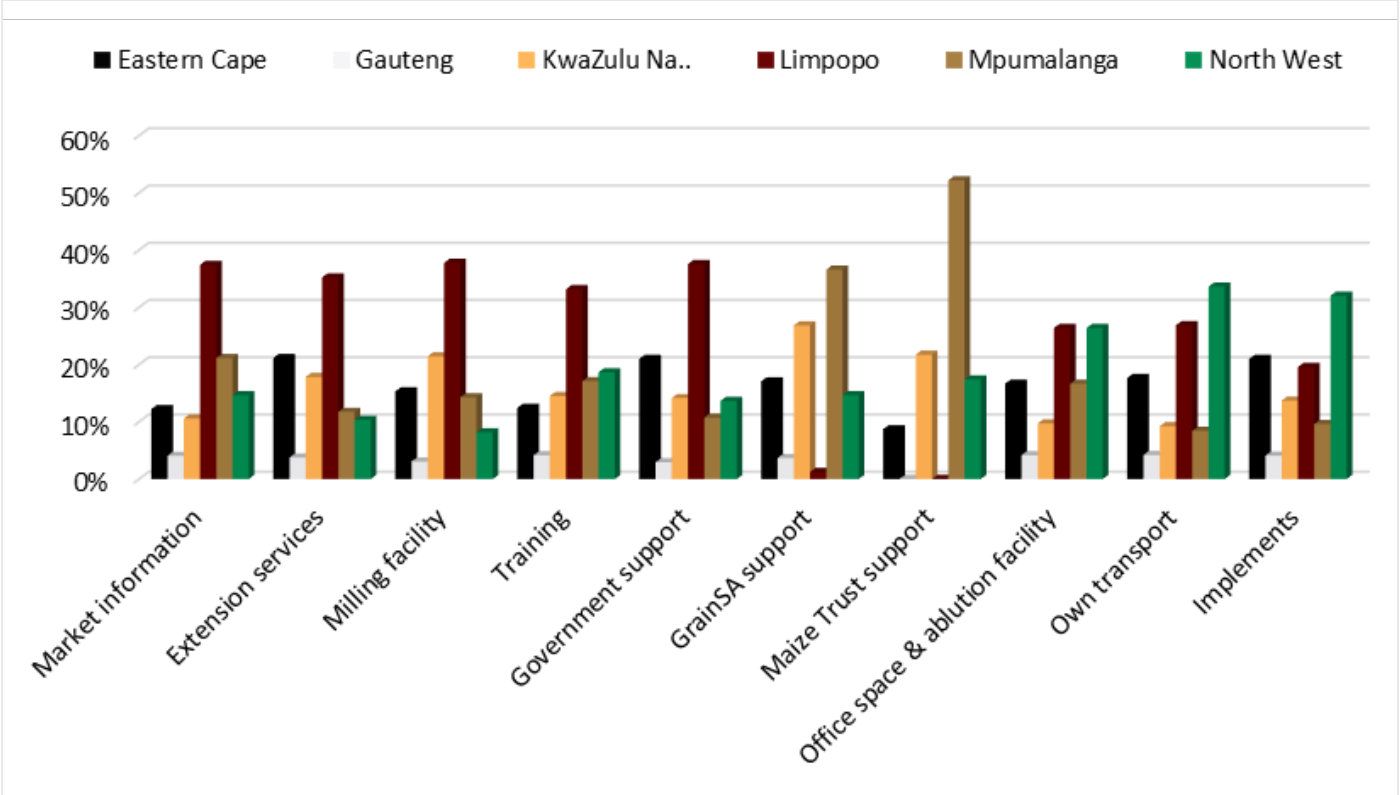

Figure 15: Summary of access to marketing services and facilities
Source: Survey data

Farmers were requested to rate their access to marketing information, services, facilities, support, and implements. The rating was measured on a scale of 1 - 4, where 1 = very poor, 2 = poor, 3 = good, and 4 = excellent. The rating was based on the number of farmers accessing these items. Farmers without access were not allowed to rate them. The results in **Table 7** show that overall, the ratings were 'poor' for market information, extension services, milling facility, government assistance, GrainSA support, and office and restroom facilities. The 'poor' rating refers to the relevance and timeliness of information, the effectiveness and availability of extension services, the condition and accessibility of the milling facility, the relevance of training, the adequacy and effectiveness of support for farmer growth, and the adequacy and condition of office space and ablution facilities. Only training received an overall rating of 'good'. When considering each province, the Eastern Cape awarded a 'good' rating only for extension services and support from both the government and GrainSA. Gauteng rated market information, extension services, and training as 'good,' while KwaZulu-Natal, Limpopo, and the North West rated all aspects as "poor.' Mpumalanga gave a 'good' rating for market information, extension services, training, and support from both the government and GrainSA.

Table 7: Summary of the ratings of market services and facilities

Variable	Eastern Cape	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Total
Market information	2.2	2.5	1.8	2.0	2.6	2.0	2.1
Extension services	2.7	2.9	2.4	2.4	2.5	2.1	2.4
Milling facility	1.9	2.0	1.8	2.0	2.2	1.7	1.9
Training	2.4	3.0	2.4	2.4	2.8	2.4	2.5
Government support	2.6	2.4	1.8	2.3	2.5	2.0	2.2
GrainSA support	2.6	2.4	1.8	2.3	2.5	2.0	2.2
Office space and ablution facility	1.4	1.7	1.4	1.6	1.9	1.7	1.6

Source: Survey data

3.5 Access to insurance

Table 8 shows farmers' perceptions of having insurance. Farmers were allowed to select more than one option if they felt there was a combination of reasons for not having insurance. Only positive (yes) results are presented. Most (84%) farmers perceive insurance as important for their farming endeavours, but only 7% have insurance. When probed for reasons for not having insurance, the results show that farmers either deemed it expensive (56%), followed by a lack of information about what they must do to obtain insurance and who offers it, as indicated by 60% of them. A small proportion (9%) of respondents felt that insurance was unnecessary due to their limited production scale.

Table 8: Access to agriculture insurance

Question	Positive responses
Do you perceive insurance to be important in your farming activity?	84%
Do you have it?	7%
What are the reasons for not having insurance?	
Expensive premiums	56%
I do not need it	9%
I do not have information about it	60%

Source: Survey data

SECTION 4:

CONCLUSION AND RECOMMENDATIONS

SECTION 4: CONCLUSION & RECOMMENDATIONS

4.1 Conclusions

A typical smallholder maize farmer is a 58-year-old male who is fairly educated and has completed secondary or tertiary education. The farmers with 120-350 hectares had the youngest mean age of 49. This age pattern indicates limited participation of young people in smallholder maize production. While many farmers with 1-5 hectares have primary education or less, most farmers in other categories have secondary or higher education. The level of education of the majority of smallholder maize producers suggests the existing potential to enhance their ability to search for, collect, and analyse market information to assist them in making productive decisions.

Female farmers dominate the 1–5-hectare group, whereas male farmers dominate the remaining groups by up to three-quarters. These findings highlight significant gender disparities in productive resource ownership.

Only three legal entity types were available to smallholder maize producers. Sole proprietorship was the most prevalent legal entity status among farmers, referring to an unregistered farming operation run by an individual. Farmers who registered private farms or operated as cooperatives dominated the 5.3-20-, 21-100-, and 120–350-hectare categories, accounting for more than 50% of the total.

Reliance on grants and pensions, mainly among farmers with 1-5 hectares, may suggest that farming alone is inadequate, possibly due to challenges such as access to factors of production (e.g., land) or lack of support, making it difficult for farmers to run viable agribusinesses. Additionally, farmers in this group typically lose money because their expenses exceed their income. One explanation is that they consumed a greater proportion of what they produced than farmers in other groups. Farmers in the Eastern Cape were the least profitable, with a loss of R5 510, followed by Mpumalanga (-R3 670), the North West (-R2 765), and KwaZulu-Natal (-R1 883). Limpopo was the only profitable province with R1 850. Moreover, a lack of record-keeping exacerbated the losses, which should be used to identify areas for improvement.

Despite farming at a loss, farmers in this group employ two to four workers during a specific period of the production season. The significance of this group of farmers and their contribution to food security is highlighted by the fact that their farming efforts assist not only household consumption but also other homes through income generation, although it is not a sustainable source. Furthermore, one could argue that the intention to incur production costs indicates profit-maximising aspirations.

In all provinces except KwaZulu-Natal, farmers with 5.3-20 hectares had higher income and profits than those with 1-5 hectares. Further analysis indicated that the average price per tonne was highest in the North West (R4 000), followed by the Eastern Cape (R3 127), Mpumalanga (R2 918), and Limpopo (R2 838), with the lowest in KwaZulu-Natal (R909). Further investigation is needed to explore why the average price per tonne in the Eastern Cape is higher than in KwaZulu-Natal, given that regions such as Matatiele, Mount Fletcher, and Mount Ayliff may have access to similar marketplaces as those in KwaZulu-Natal, such as Kokstad.

In almost every way, the farmers in the 120–350-hectare category and those in the 400–680-hectare category are very similar. The similarity between these two categories of farmers suggests that they either use less land for maize farming due to capacity constraints or engage in mixed farming, where maize is allocated a smaller portion of land or is mainly consumed by animals. Limited access to services, facilities, implements, and support provided by relevant organisations, including the government, is also visible. Even individuals with access are dissatisfied with the adequacy, relevance, availability, effectiveness, and condition of these products. Some farmers have stated that they do not spend optimally on farming inputs due to high costs, which may impact their productivity.

The results indicated that many farmers with 1-5 hectares, 5.3-20 hectares, and 21-100 hectares have permission to occupy. These farmers rely primarily on informal arrangements to borrow unused land from friends, relatives, and neighbours in their communities. Unfortunately, this limits investment in fixed and long-term improvements, reducing land productivity.

Even larger farmers with 400-680 hectares of land rely on other farmers for financial assistance. This trend is excellent as it suggests that farmers may be able to develop their own lending schemes based on trust. This type of agreement decreases interest payments to other sources of borrowed funds.

The Eastern Cape has the highest proportion (62%) of farmers supplying a single market (wholesalers) and rating it 'good' in all aspects. Retailers (32%) and households in neighbouring communities (31%) are the most popular markets in the Eastern Cape, with many elements regarded as 'good', except for the 'poor' rating for safety in households in surrounding communities. Notably, 30% of farmers supplying households in neighbouring communities said they used their own transportation. As this market includes hawkers, safety concerns could stem from deliveries to town stands, some occurring outside business hours, posing a theft risk, depending on the arrangement between buyer and seller.
In the North West, 63% of farmers supplied silos. The province rated silos as 'good' in all aspects except fairness, which received a 'poor' rating. Retailers (47%) and silos (37%) account for 84% of the farmers supplying markets in the province. Retailers, one of the province's most important markets, received a 'poor' rating in numerous areas (fairness, accessibility, and safety).

KwaZulu-Natal has the highest share of farmers supplying animal feed producers (56%), consistently rated as 'good' in all areas. Retailers (39%) and households in neighbouring areas (32%) account for 71% of the markets supplied by KwaZulu-Natal, with the province rating them as 'poor' in many aspects (fairness, accessibility, and convenience) and households in neighbouring areas as 'good' in all aspects.

Limpopo has the highest proportion of farmers supplying millers (47%) compared with other provinces. The province rates millers as 'good' in many respects, including accessibility, safety, and convenience. Retailers (44%) and households in nearby communities (28%) account for 72% of Limpopo's markets. Retailers received no rating; however, households in neighbouring communities were rated as 'good' in all aspects.

The Mpumalanga province has the largest proportion (23%) of farmers supplying millers, rated 'good' in accessibility and safety but 'poor' in fairness and convenience. Retailers (45%) and millers (24%), accounting for 69% in Mpumalanga, are rated 'very poor' in fairness and 'poor' in accessibility, but 'good' in safety and convenience.

The most important distribution channels in Gauteng include retailers (38%) and millers (23%), accounting for 61% of the market and rated as 'good' overall.

Most farmers in each province lack access to marketing information, services, facilities, implements and support. Even those who have access to these rated them poorly in terms of adequacy, relevance, and timing, apart from training, which received a 'good' rating.

4.2 Recommendations

The recommendations are organised according to important results and directed to the appropriate entities depending on their roles in the sector. Classifying farmers by land size provides insight into the differences between farmers, allowing for group-specific recommendations rather than a blanket approach. The recommendations are cross-cutting, emphasising the significance of collaboration and alignment of targets. Establishing value chain round tables and production schemes is a further strategic step towards implementing the Agriculture and Agro-processing Master Plan (AAMP).

4.3.1 Recommendations to government, GrainSA and the Maize Trust

- Several calls have been made (one of which is available here) to encourage young people to enter farming, citing the high average age of farmers in South Africa's agriculture sector. However, efforts to attract youth should be supplemented by assistance for those already involved in persuading others to join. Furthermore, platforms like this one are critical for young farmers to share their experiences and lessons while persuading others to enter the sector.
- Smallholder maize farmers with 5.3 hectares or more and secondary and tertiary education greatly benefit from capacity-building or training initiatives to enhance business acumen. These farmers possess the ability to learn and upskill through provided development programmes. Such programmes should streamline farm management, productivity, and marketing and be available comprehensively for optimal impact.
- It is crucial to intensify efforts to address gender imbalances in women's participation and ownership of agricultural resources. One way to achieve this is by targeting women and youth when distributing state land for agricultural purposes. Efforts must be coupled with improvements in tenure security. Land reform policy remains the key to promoting equality and inclusive growth in the agricultural sector. The lack of secure property ownership discourages and limits long-term investments and fixed improvements, thereby inhibiting the growth of smallholder farmers.
- Farmers indicated that they have received, and some are still receiving, support from the government, GrainSA, and the Maize Trust. However, they perceive this support as insufficient to advance farmers' potential. The main factor was the perception that the quality, adequacy, efficacy, timeliness, and condition of such support were poor. Therefore, it is recommended that support provided should be comprehensive and be linked to the desired impact to ensure that the productivity of the farmers is optimised. This entails a need for collaboration to link the transformation targets with the developmental goals of government to improve access to services, and support. Monitoring of the support provided is also key to ensuring that the intended developmental goals are achieved.
- The extension service was also rated as 'poor'. This is influenced mainly by the visibility/the presence of extension officials rather than the quality of the service. Therefore, the extension officers should strive to improve their means of communication with the farmers.
- Farmers indicated that a lack of storage, among other factors, forces them to sell their maize immediately after harvest, regardless of market prices. Consequently, investing in storage capacity in maize corridors is recommended, as it will assist smallholder farmers in evening out fluctuations in demand and supply, benefiting them economically.
- Advocacy is needed for agriculture insurance providers to play an active role in developing smallholder farmers, improving their visibility, and sharing information about their products.
- Farmers with 1-5 hectares are older, less educated, and rely mainly on social grants and pensions for a living. They tend to lose money as their expenses outweigh their income. Despite this, they feed their families and create opportunities for other community members. As such, they also play a significant role that cannot be ignored. Consequently, building a favourable business environment and providing opportunities for individuals who want to participate in and advance through the mainstream value chain is critical. A district development model could help these farmers participate more effectively in local economic initiatives.

4.2.2 Recommendations to farmers

- Farmers, particularly those involved in commercial agriculture, must strive to maintain farm records.
- Farmers must work together to increase their bargaining power and lower input and marketing costs. For example, if five farmers each spend R150 to transport ten bags of fertiliser from the market to their field and are charged based on distance and transportation mode, five farmers could transport 50 bags for R300, saving R450 or R90 per farmer.
- Trust and money lending among farmers is an effective technique that decreases interest burdens, eliminates collateral issues, and removes rigorous standards that are frequently not met by all farmers. Farmers could expand this practice in a way they believe is manageable and effective for their personal development.
- Sixty-four (64) per cent of the sampled farmers practise crop rotation, a valuable approach for minimising climate change's effects on pests, weeds, and yields. It also benefits maize production and vegetable cultivation, considering food safety regulations and chemical use. Farmers should regard it as part of good agricultural practices

4.4 Further study

Further studies highlight the NAMC's role as part of the recommendations proposed to other stakeholders.

The NAMC will conduct follow-up research based on this baseline to determine whether there has been any progress in market access. The concept was that follow-up studies would be conducted after a 2-year interval. However, this might change based on the action plans key stakeholders developed using the recommendations from this baseline. Before the follow-up study, the NAMC will participate in multiple forums and direct stakeholder engagements on market access concerns and actions based on the recommendations from this baseline and as needed under the NAMC's mandate.

It is essential to recognise the commendable ability of the farmers to diversify markets, which can enhance their overall perception by enabling them to quit those they perceive negatively. However, markets that appear to dominate in their respective provinces while receiving 'poor' ratings require special attention to understand the challenges from both perspectives. This reality applies to markets across various provinces. Therefore, the NAMC SMAT team must consider the market perspective, as emphasised in the SMAT initiative's concept note.
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