

Futures of Agricultural Employment in South Africa

2035

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Preamble

The services of the Institute for Futures Research at the University of Stellenbosch Business School were retained to explore the futures of work in the agricultural sector of South Africa. The scope of work included considering what the future of work in agriculture could look like, considering the skills barrier that could prevent the absorption of workers into the agricultural sector in the future, and the geographical areas where initiatives should be considered to have the maximum impact in future. The creation of jobs should be considered in the context of the National Development Plan (NDP), presented in 2012 to envision the future in 2030.

This was a comprehensive project, spanning 10 months in duration and involving a number of stakeholders. To ensure optimal output, and the robustness of any scenarios produced, the IFR followed a detailed research process that incorporated wide consultation with stakeholders from various areas. These included government, industry, and interest groups. Industry involvement was especially important as part of the process, since the implementation of any future strategy will require the commitment and buy-in of key industry players.

The issue of agriculture in South Africa is a complex and emotional one. The history of agriculture is intimately tied to issues such as land redistribution, political ideologies, the need for food security, and the country's Apartheid history. Historically, South Africa has been one of the premier food producers in sub-Saharan Africa, but despite the country's ability to meet aggregated food needs, hunger and poverty remain issues at the national level. Therefore, it is difficult to remain unemotional and objective when addressing issues about national agricultural production. Land ownership remains a problematic issue, and while past issues of inequality need to be addressed, land expropriation and restitution may have a destabilising effect on agricultural production. Balancing the need for reform while maintaining optimal agricultural production and ensuring food security, is therefore a complex issue.

At the same time, the country's geography and climate pose several challenges to effective farming. Large tracts of agricultural land have been degraded due to overuse and unsustainable farming methods, while erratic rainfall patterns have long established the country as a water scarce region. Climate change is intensifying the current challenges, and since many parts of the agricultural production system have long lead times, effective planning is required to counteract its impact on agricultural production.



Negating the influence of climate change may also require investment in expensive technologies; therefore, having enough of the right skills in place will be key to enabling the country to produce effectively in the future. Historically, agriculture has been one of the country's most important employers. Although the sector's importance is waning compared to that of other sectors of the economy, it remains a large employer relative to its size as a contributor to GDP. However, the sector is plagued by issues related to poor work conditions and farm evictions. Consequently, employment in the sector has remained fairly stagnant despite hopes expressed in the National Development Plan (NDP) that it could create a net 1 million jobs by 2030. At the same time, the Fourth Industrial Revolution, which brings with it greater automation, is increasingly making its impact felt – not least of which in the agricultural sector.

In searching to understand the way forward for employment creation in the South African agricultural sector, it is also important to reflect on why significant numbers of jobs have not yet been created almost a decade after the NDP was originally tabled. To materially change the outcomes achieved to date, a sober assessment of the key drivers for employment creation in the agricultural sector needs to be considered.

Thus, to formulate a robust and multi-faceted futures perspective, the IFR employed a selection of futures methodologies to analyse and crystallise this problem, with the purpose of identifying the opportunities in agricultural employment for South Africa toward 2035. These included various project phases such as detailed problem scoping, scanning, a colloquium session, and a scenario creation workshop. Ultimately, the IFR's aim was to create scenarios that can provide real value to all stakeholders and provide more clarity on the alternatives facing the agricultural sector. Four scenarios were contemplated.

While the futures of employment in the agricultural sector remain a complex and multi-faceted problem, the report provides some guidance on how these issues can be addressed. There is little time to waste however, and the co-operation of all role players will be vital.



Research Agenda

The project commenced in early 2021. A strategic briefing took place on 4 March 2021, with various participants from the IFR, the agri sector, and broader stakeholder groups, including the department of employment and labour, BUSA and NGOs. The purpose of this session was twofold – to provide an overview of the fundamental principles of foresight / futures thinking, and to agree upon the scope of the scenarios exercise.

Participants discussed criteria for both a preferred and a dystopian future for employment in the agri sector, and they agreed on the scope for the scenario exercise. The scope was formulated as:

The Futures of Agricultural Employment in South Africa in 2035

The scope was defined in this broad manner to include the agricultural sector in its entirety - also considering its up- and downstream linkages in the economy - since this is an important aspect of the agricultural sector as an employer. Although the goals outlined in the NDP were framed as being achieved by 2030, we believed that from a futures perspective, a longer time frame (2035) was more appropriate.

After the research briefing session, the IFR commissioned a scan on the barriers to job creation, and the factors that could influence the futures of job creation in the agricultural sector.

The IFR subsequently hosted a research colloquium (thinking session) aimed at distilling the key factors that could influence the futures of job creation in the agricultural sector on 6 May 2021. The session was attended by participants from various industries, bringing a valuable and diversified perspective to the process. The output from the colloquium session was used to identify potential key certainties and uncertainties which were used as inputs into a scenario crafting session.

A scenario crafting session took place on 31 May 2021. Following the scenario session, the IFR team developed the outlines provided by participants into four full blown scenarios.

Further analyses and foresight activities by the IFR team resulted in the compilation of this report.



Environmental Scan: Current Context

According to South Africa's National Development Plan (NDP), the agricultural sector needs to create 1 000 000 jobs by 2030. Current employment within the agricultural sector is below 900 000 jobs and employment growth within the agricultural sector remains stagnant. Technological advances and the automation that comes with it, might have a further negative impact on employment levels. There is a need to be informed of the potential scale of these disruptions while establishing new opportunities.

The primary agricultural sector in South Africa is not subsidised and is subject to global competition in terms of export commodities, and thus the competitiveness of the sector is a key concern.

Currently, a significant portion of jobs in the agricultural sector are found in the fruit industry, which is an export commodity, while the issue of labour migration also needs to be addressed to see where development of labour-intensive agricultural activity could have the most impact on job creation.

Given these challenges, the question arises how the agricultural sector can actively work to meet the job creation targets as set out in the NDP.

The issue of agriculture is intimately tied to the history of South Africa and is an emotive one. Issues of landownership, exploitation of large sections of the population and repression are tied so narrowly into the country's history, that it is often nearly impossible to have objective and non-emotional discussions about the futures of agriculture.

Agricultural production itself can ordinarily not be divorced from questions of natural and resource endowment, climate, environmental management, and labour. Furthermore, South Africa's history makes agriculture a highly complex and sensitive issue. Moreover, agriculture and redistribution of land continue to be seen as central to poverty alleviation efforts, even as efforts in the first twenty-seven years of democracy have largely failed to achieve their stated goals.

Food security is an issue of national importance. Inappropriate agricultural policymaking could destabilise food security, which would have broader economic impacts that the country could potentially ill afford (e.g. the need to import more agricultural products and staple foods from abroad to meet basic food requirements, putting pressure on the currency and balance of payments).



Some agricultural activities, like fruit and nut production, have long lead times and highly specific growing requirements. Trees must sometimes be ordered up to a year in advance, may take several years before starting to bear fruit and several more before reaching full production. Once they start bearing fruit, however, trees can continue yielding crops for several years and in some instance even several decades (e.g. nuts, avocados, oranges). However, successful fruit bearing require that specific conditions are met to ensure continued optimal yields (rainfall, temperatures, efficient management, etc.).

Commercial agriculture is a highly scientific endeavour. Inputs, timing, and resourcing all need to be customised to the land and climatic conditions to ensure optimal yields. There is often little room for error, and mistakes can be costly.

THE VISION AND TARGETS AS SET OUT IN THE NATIONAL DEVELOPMENT PLAN

South Africa's National Development Plan (NDP) sets out the vision for achieving inclusive economic growth by 2030. The report makes it clear that government views agricultural job creation as key to poverty alleviation in rural areas (NDP, 217). "Rural economies will be supported by agriculture and, where possible, by mining, tourism, agro-processing and fisheries" (NDP, 218). The plan envisages that the agricultural sector is capable of creating almost 1 million jobs by 2030. The table below is excerpted from the NDP. A large portion of jobs is envisaged as created by subsistence and small-scale agriculture, and by expansion of labour-intensive agriculture (citrus farming, table grapes, sub-tropical fruit, etc.).



Target group	Primary jobs created	Secondary jobs created	Assumption
Subsistence farmers with < 0.5 hectares	83 000	41 500	The livelihoods of one in 10 of the farmers in this category are improved
Small-scale farmers with between 0.5 and 5 hectares of land	165 000	82 500	The livelihoods of half the farmers in this category are improved
Small-scale farmers with > 5 hectares of land	75 000	37 500	These farmers employ themselves and two others
Better use of redistributed land	70 000	35 000	Redistribution beneficiaries employ themselves and two others; one in 10 restitution beneficiaries become self-sufficient
Labour-intensive winners	200 000	100 000	Critically, this requires investment in irrigation, support to smallholder farmers and their ability to grow their businesses.
Labour-extensive field crops	10 000	5 000	This reflects a 'high road' or optimistic scenario and assumes that the current decline in employment in commercial farming is halted
Labour-extensive livestock	40 000	25 000	This reflects a 'high road' or optimistic scenario and assumes that the current decline in employment in commercial farming is halted.
TOTAL	643 000	326 500	
	969 500		

Source: NDP, 220



The NDP further classified agricultural employment by type and growth potential, as indicated below. The logic is that focusing on more labour-intensive employment, agricultural sectors could have the ability to create more jobs in the long run.

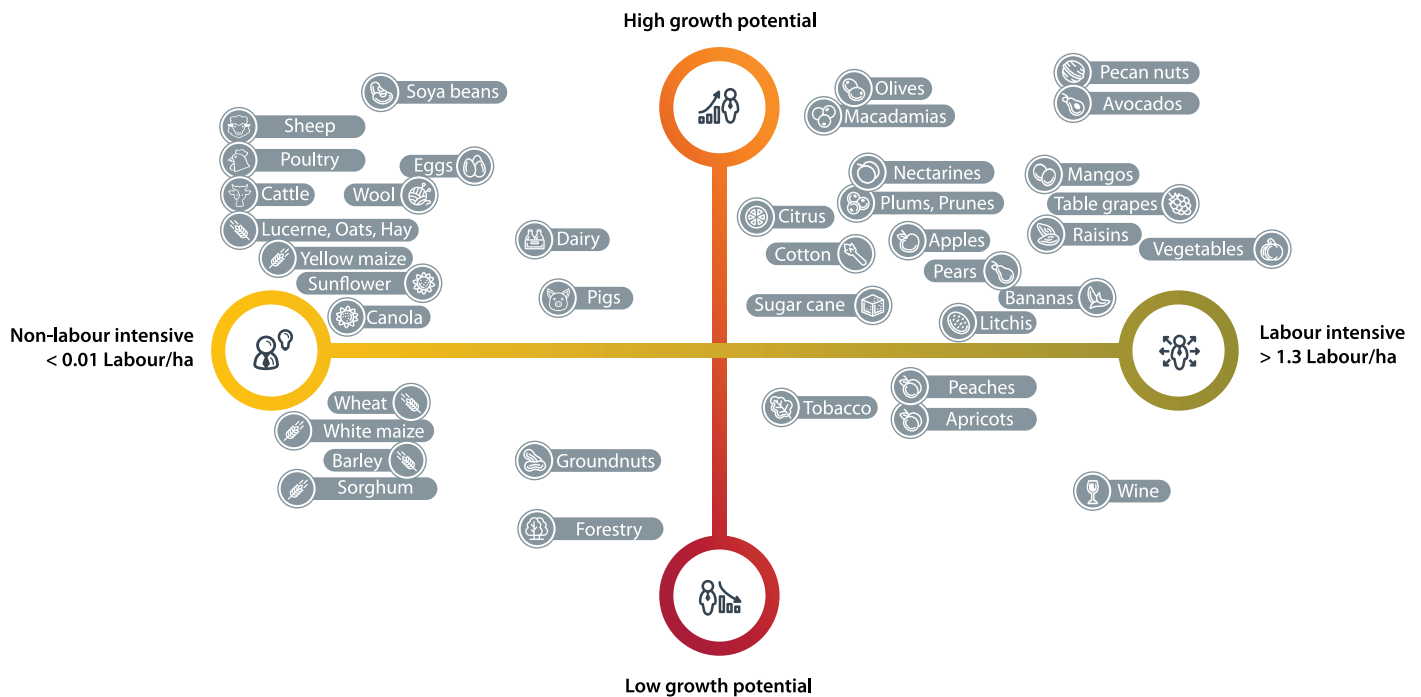


Figure 1: Agricultural employment by type and growth potential
Source: NDP, 223; Bureau for Agricultural Policy, 2011

The NDP envisages an expanded agricultural sector driven by increased irrigation, more efficient usage of some underused areas (including through land reform) and the use of communal areas, careful selection of agricultural sectors, and choosing to promote areas that have the highest potential for growth and employment, supporting job creation in up- and downstream areas. These efforts will in turn drive increased employment. The NDP envisions expanding areas under irrigation from the current 1.5 million hectares (which yield most of the country's horticultural harvest and some field crops) by at least 500 000 hectares through the more efficient usage of existing water resources and by developing new water schemes.

"The vision includes better integration of the country's rural areas, achieved through successful land reform, infrastructure development, job creation and poverty alleviation. The driving force behind this will be an expansion of irrigated agriculture, supplemented by dry-land production where feasible" (NDP, 218).

THE CONTRIBUTION OF AGRICULTURE TO THE ECONOMY OF SOUTH AFRICA

The most recent SA General Household Survey 2019 (Stats SA) highlights that 15.3% of households were involved in agricultural production. Drilling down into the reasons for agricultural involvement, it is noteworthy that participation is highest in Limpopo and Mpumalanga. More than three-quarters of households (75.4%) that were involved in agriculture, did so to secure an additional source of food. Provincially, 92% of households in Limpopo, and 81.9% of households in Mpumalanga were engaged in agricultural activities to augment their existing sources of food. For 2.5% of South African households, agricultural involvement was their main source of income, 6.8% used it as an extra source of income, while it was the main source of food for 10.1% of households.

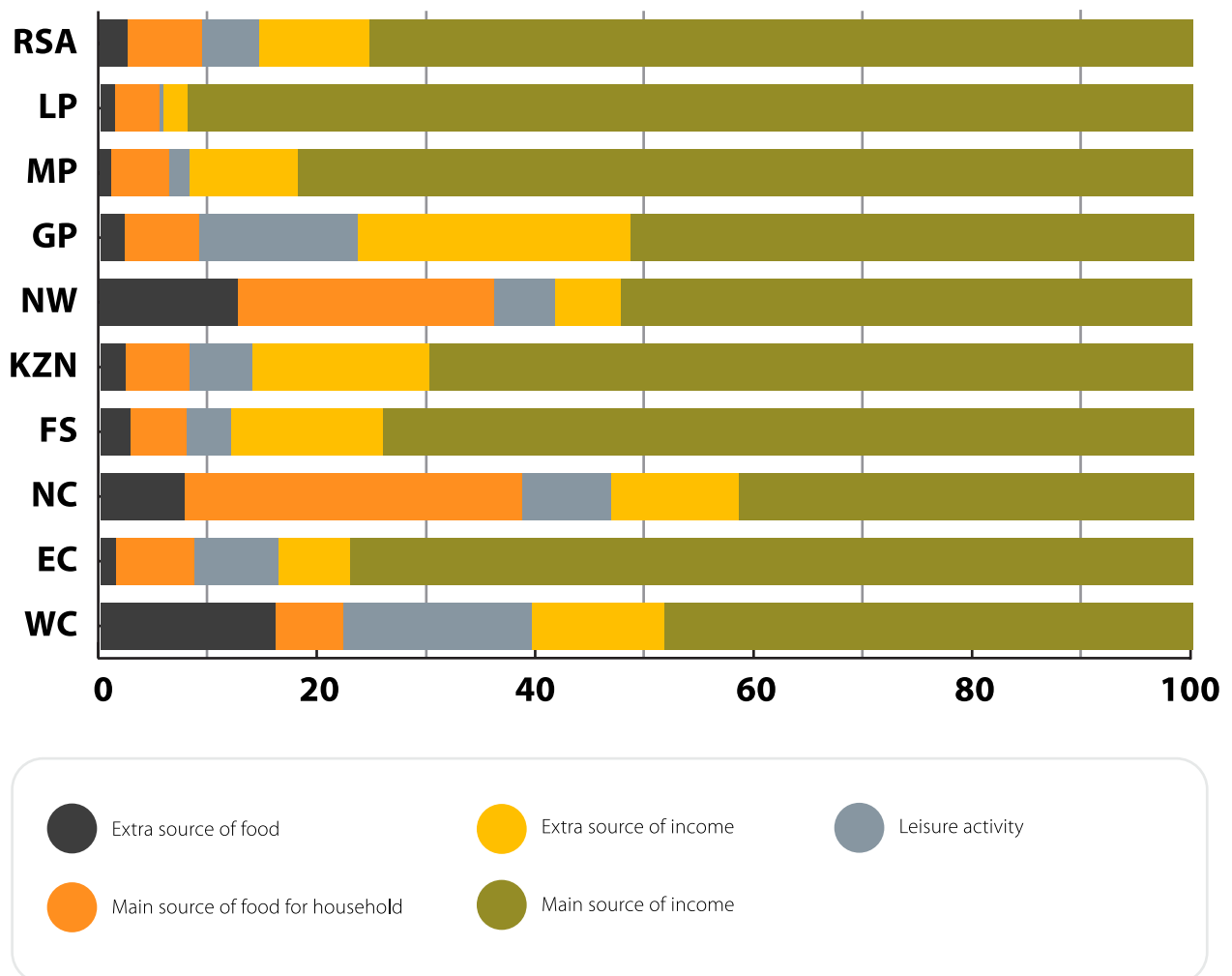


Figure 2: Main reason for being involved in agriculture, per province
Source: StatsSA General Household Survey 2019, p61



Despite a relatively small contribution to national GDP at just under 3%, agriculture is an important contributor to the national economy, as it is an important earner of foreign currency, employs a significant number of people, and has several forward and backward linkages into the rest of the economy - about 70% of agricultural output is used as intermediate products in the manufacturing sector. The green sections in the graph below illustrates the relative contribution of agriculture, forestry and fishing to GDP since 2015.

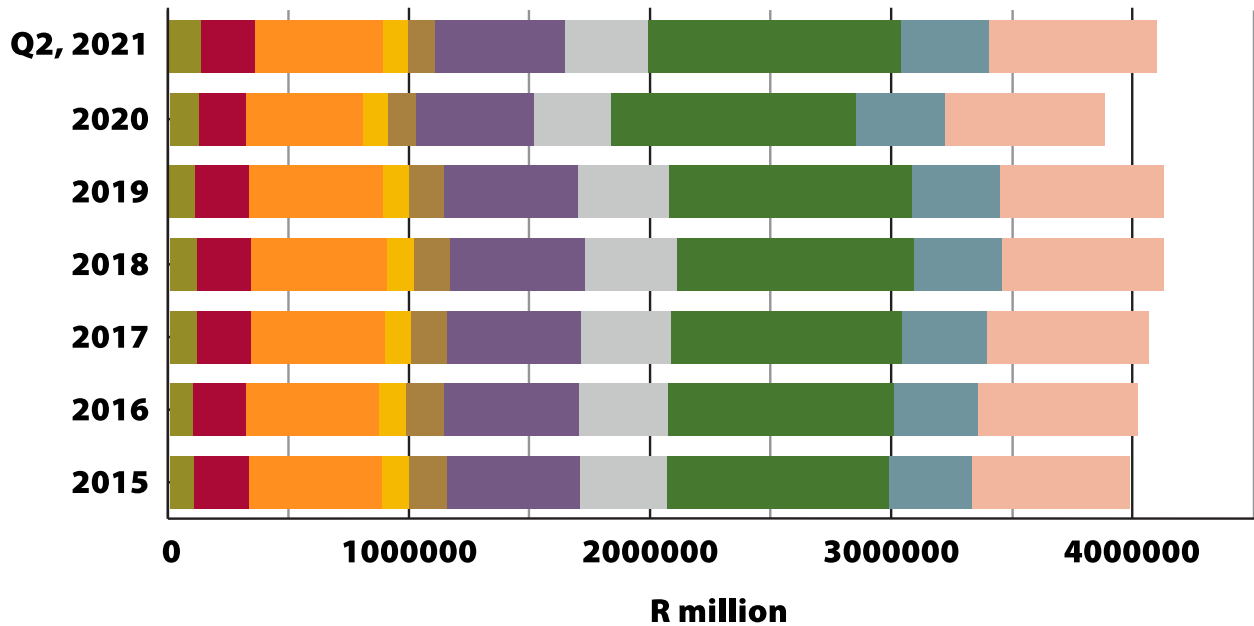


Figure 3: Industry value added and GDP (constant 2015 prices, seasonally adjusted and annualised)
 Source: Compiled from data in StatsSA P0441 Gross Domestic Product Second Quarter, 2021

STRUCTURE AND PROFITABILITY OF THE AGRI SECTOR

Large enterprises in the agri sector contributed R211.3 billion (60.2%) of the total 2019 income, while small enterprises contributed R78.8 billion (22.4%), with micro enterprises contributing R31.9 billion (9.1%) and medium enterprises R29.3 billion 8.3%, as illustrated below.

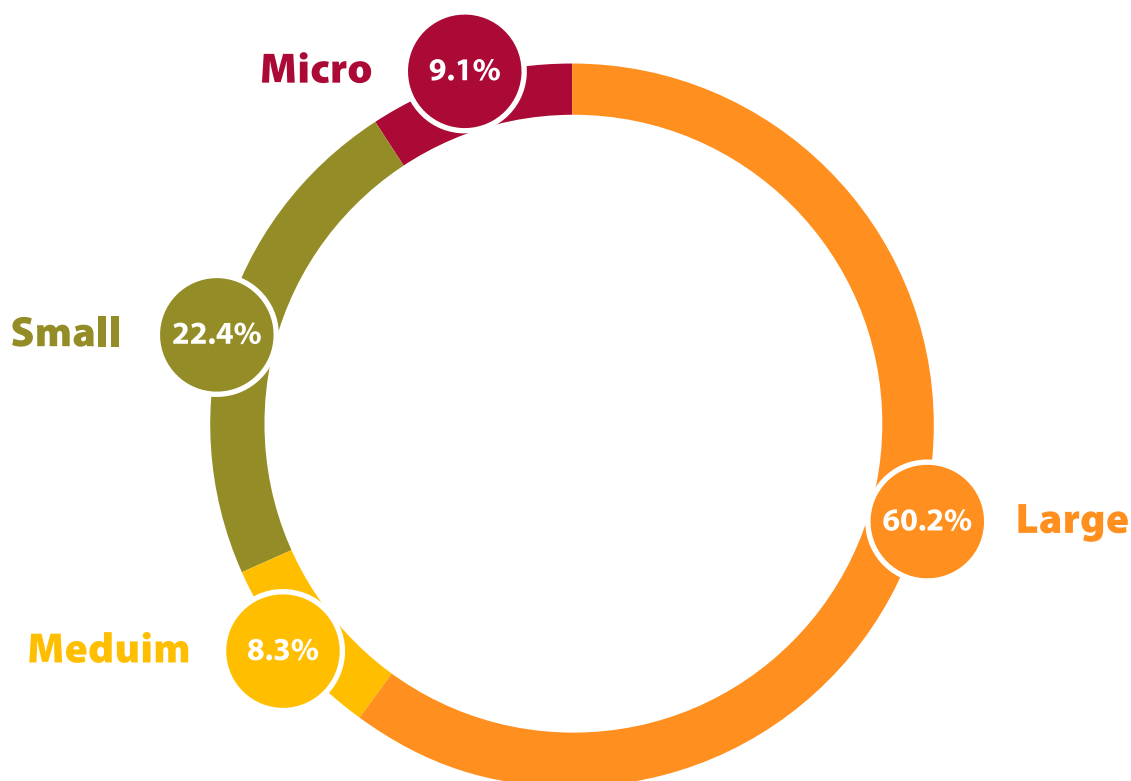


Figure 4: Contribution according to size of agricultural enterprise
Source: Agricultural survey, 2019. Page 4

The average profitability of agricultural endeavours in South Africa is 5.97%. As indicated below, profitability ranged between making a loss and a maximum of 10.9% in 2019, depending on the type of activity.

The table provides a summary of total income and expenditure by type of activity in the agriculture and related services industry, in 2019.



Activity	Total income '000	Total expenses '000	Profit	Profit %
Growing of crops; market gardening; horticulture	138 619 426	130 438 419	8 181 007	5.9%
Farming of animals	141 053 855	131 289 283	9 764 572	6.02%
Growing of crops combined with farming of animals (mixed farming)	58 010 170	55 708 034	2 302 136	3.97%
Agricultural and animal husbandry services, except veterinary services	10 973 282	9 802 420	1 170 862	10.67%
Hunting, trapping, and game propagation including related services	2 765 508	3 185 177	- 419 669	Loss
TOTAL	351 422 241	330 423 333	20 998 908	5.97%

Source: StatsSA Agricultural survey, 2019. P7

Agbiz and the IDC collect data that informs their Agribusiness Confidence Index every quarter. It covers agribusinesses operating in all the South African agricultural subsectors. The 50-point mark is neutral, with scores above 50 indicating optimism about operating conditions and a score below 50 signaling a negative outlook. As the graph below indicates, confidence levels have fluctuated quite significantly over the past two decades. For the third quarter of 2021 it stands at 67, down from a record high of 75 in the second quarter.

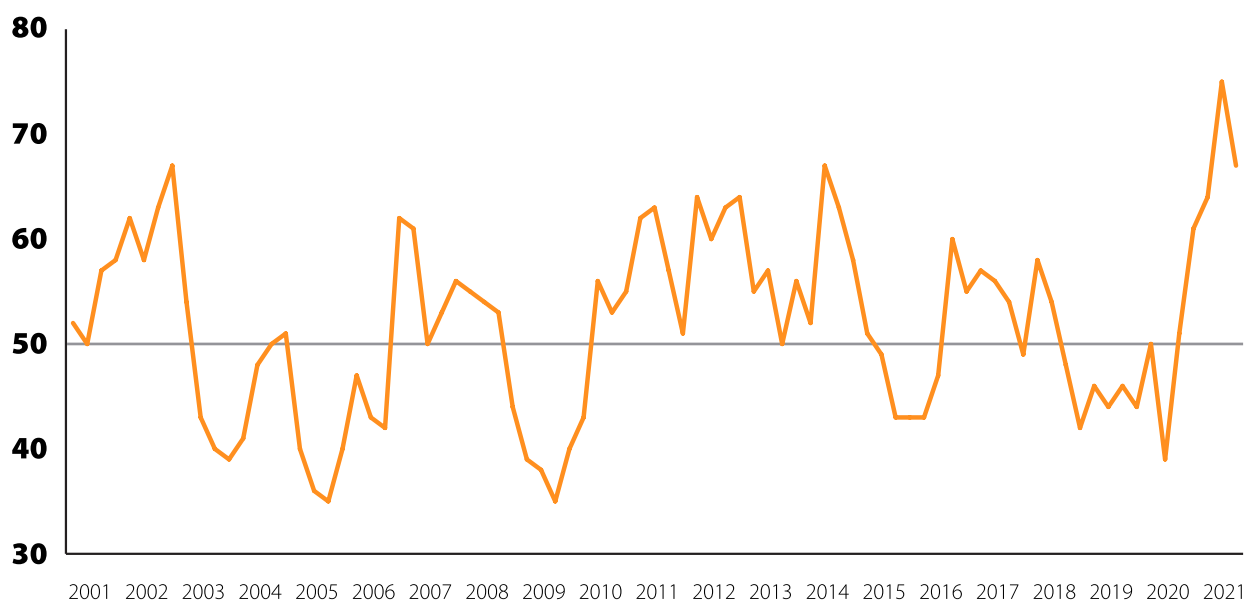


Figure 5: Agbiz IDC Agribusiness Confidence Index, 2001 - 2021

Source: Compiled from Agbiz/IDC Agribusiness Confidence Index data, Q3,2021



IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCTS

The 2020/21 Economic Review of the South African Agriculture, compiled by the Department of Agriculture, Land Reform and Rural Development, asserts the importance of South Africa's agri sector in both the import and export of agricultural products. The table below provides details of the main products.

Important agricultural import products in terms of value

Rice
Palm oil
Offal of fowls
Gin
Oil cake

Important agricultural export products in terms of value

Citrus fruit
Dried grapes
Grape must
Apples
Maize

FOOD CROPS OF THE FUTURE

The WWF and Knorr recently published a report that they called 'Future 50 Foods'. In their endeavours to identify 50 foods of the future, they:

- Focused on plant-based foods
- Optimised nutrient density
- Evaluated the environmental impact, both in terms of climate change and land use
- Considered culture and flavour
- Ensured that the foods were distributed evenly across food groups, colours, production countries, and level of familiarity.

The 50 foods are illustrated below.



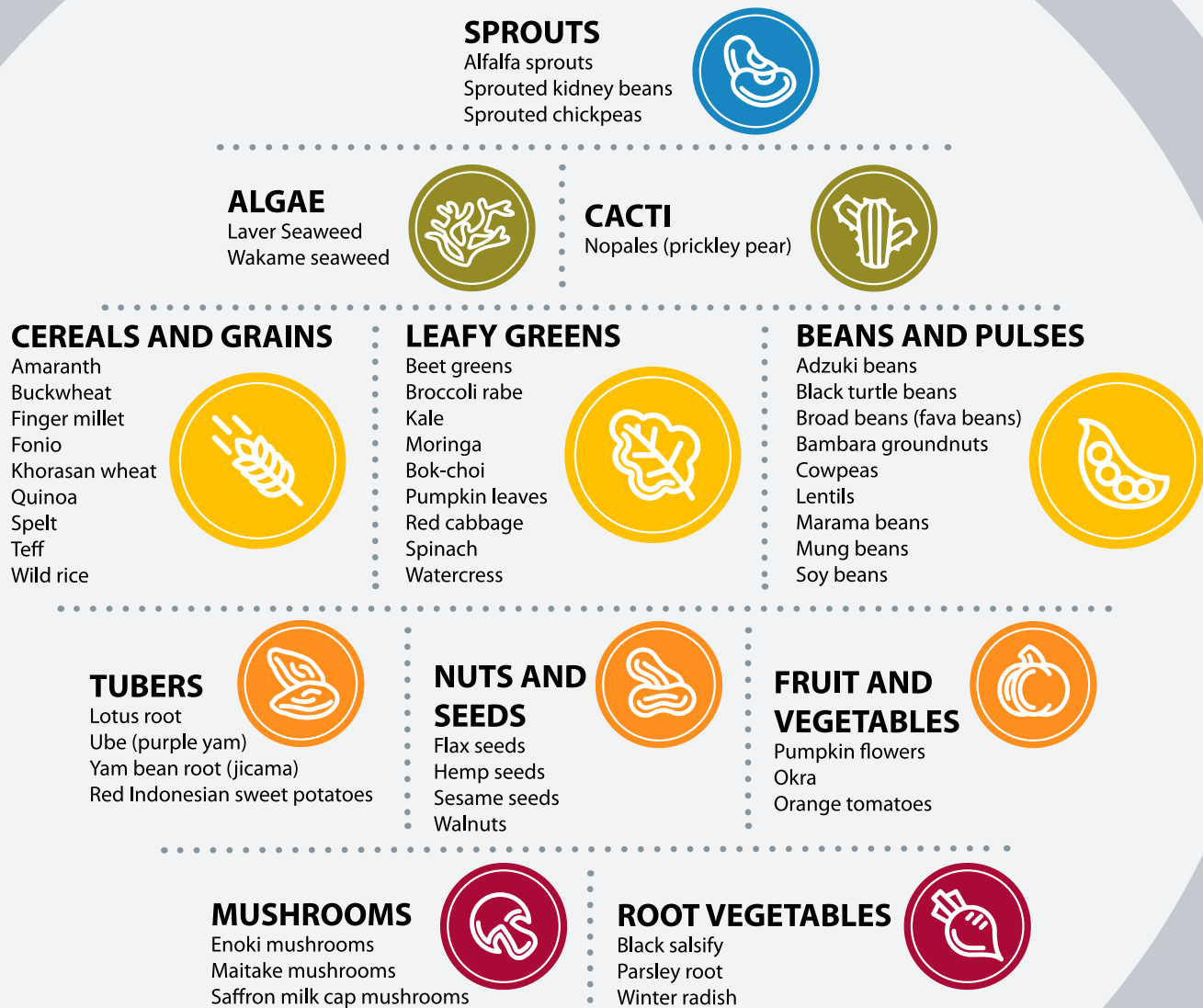


Figure 6: 50 foods of the future

Source: Compiled from WWF and Knorr Report: Future 50 Foods



LAND USE, LAND DEGRADATION AND LAND REDISTRIBUTION

The productivity of agriculture is highly dependent on key inputs: viable land and rainfall. Any agricultural development strategy can therefore not be formulated in isolation of these. Today, around 60% of South Africa's land is considered as being degraded (the UN 1997 United Nations Environmental Programme) and 91% is potentially susceptible to desertification. While a significant portion of South Africa's land surface area is used for agriculture, only about 11 percent of this is suitable for cultivation. According to Mkhabela (2020) "Land degradation undermines the productive potential of land and water resources, affects human welfare, and causes extensive alien plant invasion and biodiversity loss."

Therefore, ensuring the land we do have is managed sustainably, and is being put to the most effective use, is key to ensuring a viable agricultural sector going forward.

There is an imperative to address the historic imbalance in land ownership created by the country's Apartheid legacy. According to the final report of the presidential advisory panel on land reform and agriculture (2019, 11) the pace of land reform in South Africa has been slow. It estimates that the current progress that has been made in terms of land "amounts to under 10% of all commercial farmland, over 23 years, compared to the initial target of 30% by 2014." The lack of progress is a source of frustration and pose potential risks to social stability and cohesion.

Issues around land redistribution may further intensify issues of land degradation. While it is often argued that redistribution will see unproductive land put to better use, this ignores that land is not currently being used for agricultural purposes, because it is marginal or not suited for agricultural use. Secondly, when land is parceled into ever smaller pockets, it often become susceptible to further degradation, since its more intensive use is required in order to be viable (Scholes, 2017). Thus, current land restitution policies may inadvertently also result in worse outcomes from a land conservation perspective.



THE INFLUENCE OF CLIMATE CHANGE

South Africa is a water scarce country, and climate change is likely to exacerbate the issue. It is impossible to consider the future of agriculture without also considering the influence of climate change on the viability of the current agricultural strategies. Moreover, the sustainability of South Africa's current agricultural practices and strategies should be considered in the light of climate change.

South Africa is susceptible to droughts and experiences variable rainfall patterns. More than 95% of stored surface water is allocated to domestic, industrial and agricultural use, with national demand for water expected to increase by 32% toward 2030 (South Africa's First Climate Change Report, 43). Demand for irrigation is also expected to increase by an average of 4% to 6% per annum toward 2050. "This is a major concern given that water is virtually fully allocated in most regions" (South Africa's First Climate Change Report, 46).

South Africa's climate is varied, and data is not always readily (or consistently) available. Moreover, longer duration weather phenomena like El Niño (hotter and drier periods) and La Niña (colder and wetter periods) also influence observed weather patterns, although there is some variability in rainfall that is not entirely explained by these phenomena. However, long-term observations indicate that large parts of the country are becoming warmer and drier, with fewer rainfall days and greater risk of intense rainfall.

Data observations between 1960 and 2010 point to climate trends developing in South Africa; these are summarised in the table below. (South Africa's 1st Annual Climate Change Report Theme C: Climate Change Trends, Risks, Impacts and Vulnerabilities, pp 25 – 27.)

Limpopo

Regional means show significant reductions in the number of rain days (with associated increases in rainfall intensity) in summer and autumn. Significant increases in maximum temperature, with the strongest warming signal occurring in spring (September-October-November).

Minimum temperatures, however, experienced strongest warming in summer and winter (June-July-August).

Extremely hot days have increased significantly at all except one station in winter and spring, but trends for the other months are weak and less intended to carry over to warmer months.

Extremely cold nights show general reductions in all seasons, but not all are statistically significant.



Mpumalanga

Rainfall days have been declining at most stations, annually and across all seasons, with the trends showing statistical significance. These changes imply an increase in the intensity of rainfall.

Regional means show large inter-annual and decadal scale variability in rainfall indices, but significant reductions in rain days are evident for all seasons.

Significant increases in maximum temperature have been observed for the seasons of autumn, winter and spring. The summertime increases do not exhibit statistical significance.

Minimum temperatures have increased with statistical significance across all seasons. Spatial patterns for the daily temperature range are mixed and no region-wide trends are evident.

Extremely hot days have increased significantly for winter and spring. Extremely cold nights show general reductions in all seasons.

KwaZulu Natal

Rainfall totals have been observed to decrease along the east coast, driven by statistically significant changes in the autumn rainfall totals. For the other seasons, mixed and statistically insignificant trends are reported in terms of rainfall totals.

The number of rainfall days exhibit statistically significant decreases across all seasons and annually.

The 90th percentile of daily rainfall totals also exhibit negative trends, particularly for the spring and summer seasons in the southern Drakensberg area.

There is large temporal variability and no regional mean trends in rainfall indices, but stations suggest a spatially coherent reduction in rainfall totals, rainfall days and 90th percentile of daily rainfall totals for autumn.

Maximum and minimum temperatures have been increasing across all seasons, with the trends being statistically significant for all seasons except spring. Extremely hot days and extremely cold nights have been increasing consistently and decreasing, respectively.

Eastern Cape

Trends in rainfall totals and the number of rainfall days are generally of a mixed signal and do not exhibit statistical significance. An exception is the most eastern parts of the province, where the number of rainfall days have been declining with statistical significance.

Temperature stations are confined to the southern part of the province, where both minimum and maximum temperatures have been increasing with statistical significance, annually and across all seasons.



<h2>Western Cape</h2>	<p>Trends in rainfall totals are generally not significant and show little spatial consistency across the province. Rainfall days, however, exhibit a fairly consistent and statistically significant decreasing signal along the southern coastal regions.</p> <p>Both maximum and minimum temperatures have been increasing significantly at most stations in all seasons, accompanied by increases in extremely hot days and decreases in extremely cold nights.</p>
<h2>Northern Cape</h2>	<p>Station coverage is relatively sparse in this province, implying that regional means should be interpreted with caution.</p> <p>Trends in rainfall totals and the 90th percentile of daily rainfall are generally insignificant and exhibit little spatial consistency. However, there is evidence of spatially coherent increases in rainfall totals in the eastern parts of the province, with associated and statistically significant increases in the number of rainfall days in the eastern part of the province.</p> <p>Temperature stations are limited to the western part of the region, but all stations exhibit significant increases in maximum temperature and extremely hot days, for all seasons and annually. A large part of this warming can be attributed to persistently above-average temperatures in the last 10 years of the record.</p> <p>Increases in minimum temperature are generally weaker than those seen in maximum temperature, with stations in the far eastern parts of the province exhibiting decreasing trends in maximum temperature. As a result, the daily temperature range has been increasing across the province.</p>
<h2>Gauteng, Free State and North West</h2>	<p>There have been significant increases in rainfall over the western parts of the Free State and North West provinces, with changes over the three provinces being otherwise statistically insignificant.</p> <p>Some significant increases in rain days are apparent in the western part of the Free State and North West, but over Gauteng and the eastern parts of the Free State and North West these trends are negative.</p> <p>Temperature stations show strong increases in maximum temperature for all seasons and annually.</p> <p>Increases in minimum temperature are generally weaker than those seen in maximum temperature, resulting in generally increased daily temperature trends. In the western parts of the Free State and North West minimum temperatures are exhibiting upward trends.</p>



Climate change projections seem to indicate that, while South Africa is not projected to warm as much as some of its neighbours to the north, the country is likely to become generally drier and hotter, with fewer rainy days and more sporadic (and extreme) rainfall. This is likely to have an influence on the water available for agricultural irrigation in future and could mean that cultivation may no longer be viable in some areas. In addition, shifting climate conditions are likely to have an influence on the yields from crops. For example, certain crops (like citrus) require cold winters for fruit to yield optimally, while crops like avocados have high rainfall requirements (>1000mm per year). Therefore, the changing climate may influence agricultural yield and the viability of crops currently cultivated, even while land remain technically arable and productive. Any agricultural strategies should therefore be developed with the likely changes in climate patterns in mind, to ensure their continued sustainability in the long run.

Climate change is also likely to increase the importance of technology, know-how, and expertise in offsetting environmental impacts. A mismatch between educational output and the needs of the agri sector, not only places the country in a vulnerable position, but also creates barriers and constraints to the current and future employment potential of the sector.



EMPLOYMENT IN AGRI AND RELATED SERVICES

Despite the barriers that are currently limiting the further expansion of employment, agriculture remains an economically important sector and one that has to contend with ongoing challenges. Greyling (2015) notes that despite the small relative size of the agricultural sector, it is one of the biggest employers in the economy and is typically labour-intensive compared to other sectors. He states that the agricultural sector “uses two units of labour per unit of value added, whilst the ratio is 0,3 and 0,94 for the mining and manufacturing sectors”. While this has a positive potential when it comes to job creation, it could also be indicative of low labour productivity in the sector.

According to the StatsSA Agricultural survey of 2019, released in May 2021, there were 768 171 people employed in agriculture and related services in South Africa, with the largest number of people employed in the growing of crops, market gardening and horticulture. The graph below illustrates the split between males and females according to the different agricultural activities.

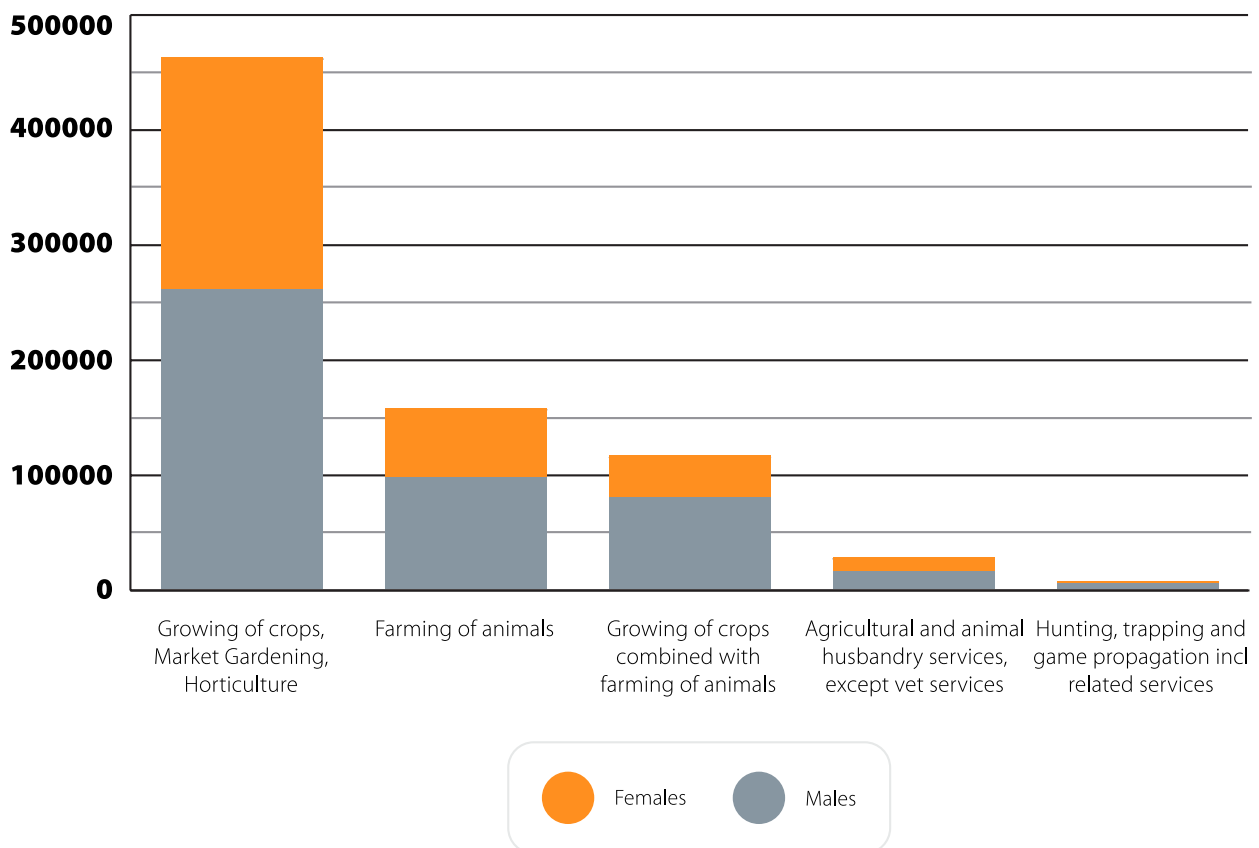


Figure 7: People employed in agriculture and related services, by activity and gender

Source: StatsSA Agricultural Survey, 2019. P14



In August 2021, Agbiz chief economist, Wandile Sihlobo indicated that the influence on jobs of the recent increase in minimum wages of farm workers may only be felt later. The graph below illustrates agriculture employment from Q1 2008 to Q2 2021.

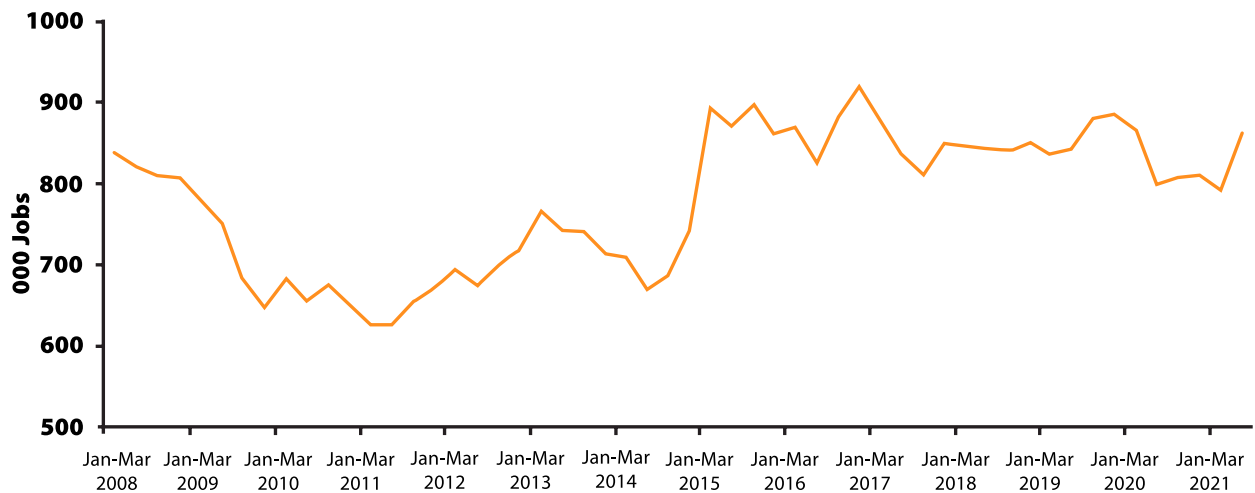


Figure 8: Agriculture employment 2008 - 2021
Source: Agbiz 24 August 2021

The role of agriculture as an employer in the South African economy, is decreasing. The graph below illustrates this trend clearly.

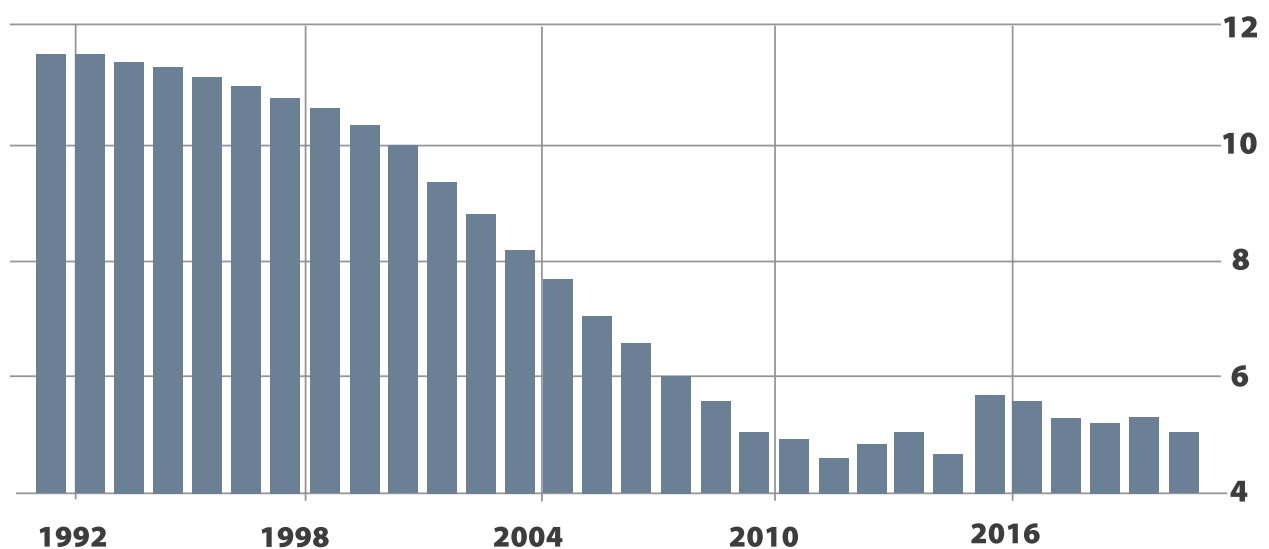


Figure 9: Share of agriculture in total employment, 1992-2020
Source: Trading Economics



The declining role of agriculture in South Africa is in line with that of developing economies. According to the World Bank: "While the employment share in farming tends to decline as per capita incomes rise, the share in food manufacturing and services tends to increase." However, South Africa's shedding of agricultural jobs has been above trend. This is commonly ascribed to the intensification of labour and minimum wage regulation in the agricultural sector, together with the uncertainty created by land reform and redistribution policies.

One should also consider the barriers to employment that is preventing the sector from reaching its full potential as an employer. These barriers are many and varied, as outlined in the PESTEL analysis. Issues of poor educational quality and systemic corruption, together with the politicisation of policymaking, cast a long shadow and raises barriers that hamper further job creation.

SKILLS LEVELS IN SOUTH AFRICA

Efforts to create economic opportunities in South Africa, may be hampered by the low skills levels of the unemployed, as well as the shortage of certain skills. The graphic below illustrates that 51% of the unemployed in South Africa did not finish matric, while 38% has matric as their highest level of education attained.

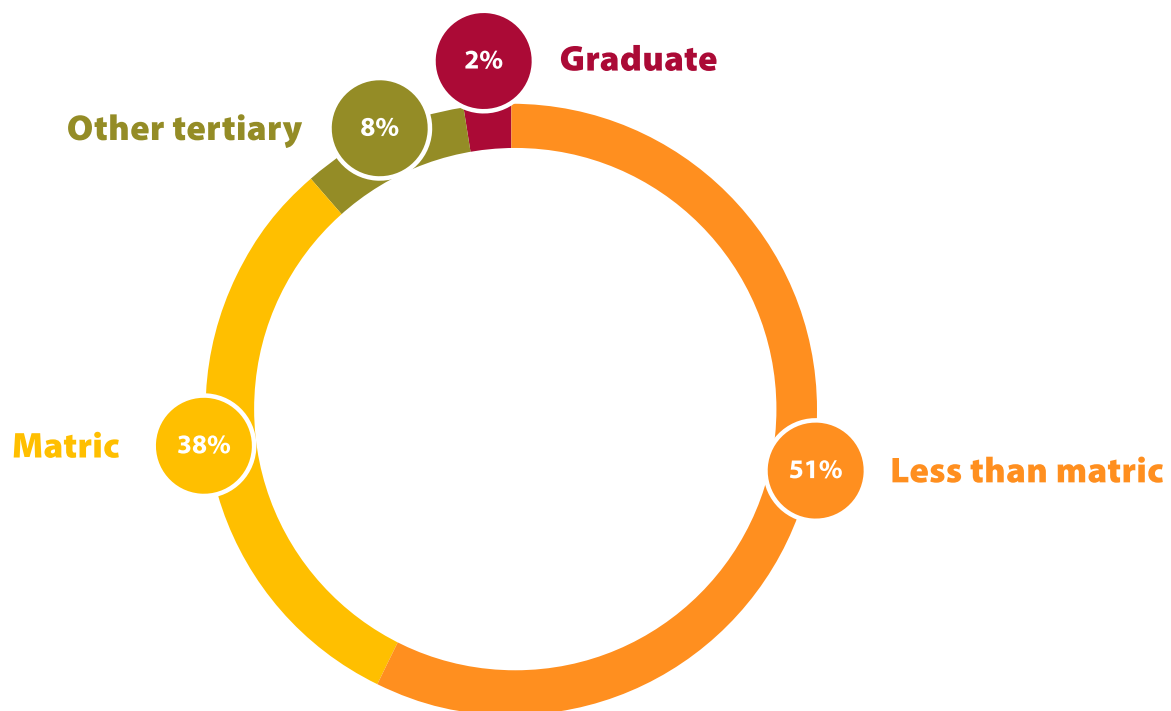


Figure 10: Skills levels of the unemployed in South Africa
Source: StatsSA Quarterly Labour Survey, Q2, 2021

The agri sector may find it hard to recruit people with appropriate skills. An analysis of the draft critical skills list published by the Department of Home Affairs in February 2021, produced more than 20 occupations that have ties to the agri sector.

- Policy and planning manager
- Research and development manager
- Agricultural farm manager
- Data management manager
- Application development manager
- Hydrologist
- Food and beverage scientist
- Industrial engineer
- Agricultural engineer
- Agricultural engineering technologist
- University lecturer
- Management accountant
- Policy analyst
- Marketing practitioner
- Data scientist
- Software developer
- ICT security specialist
- Mechanical engineering technician
- Industrial machinery mechanic
- Diesel mechanic



MIGRATION

The African Centre for Migration and Society at the University of the Witwatersrand published a fact sheet on foreign workers in South Africa during 2017. According to their analyses, foreign-born migrants have a higher likelihood of doing precarious jobs. Furthermore, the bilateral agreements between South Africa and some neighbouring countries, combined with a situation where low-skilled workers have limited legal channels of entry, generate a situation where labour brokers become pivotal. In the agri sector, formal labour brokers offer a service where they organise and manage all aspects around recruitment, movement, and wage payments. However, there is also a shadow/informal system of labour-broking that works around/outside legal channels, using social networks and other informal systems to manage large numbers of, particularly seasonal, workers. Within South Africa, there is a continuous flow of people between provinces. In the latest update of the population prospects, StatsSA estimates migration flows as indicated in the graph below.

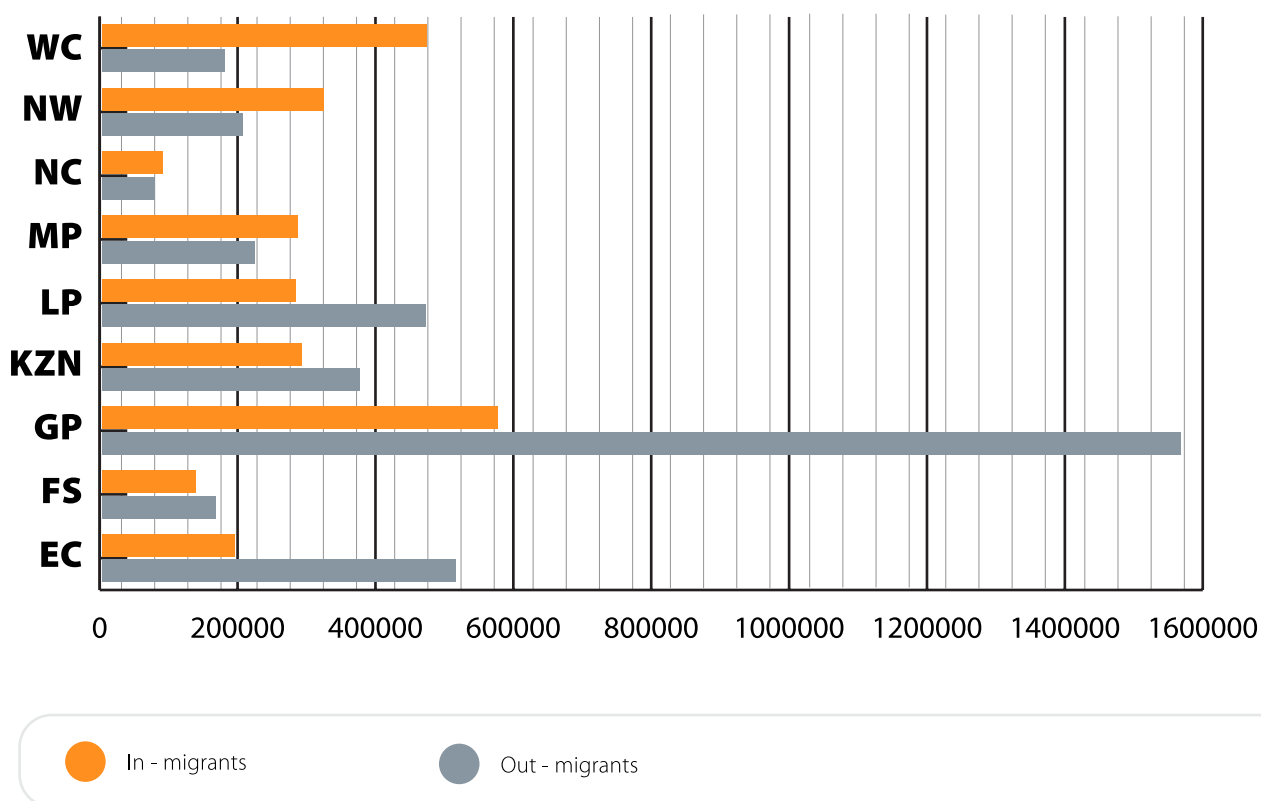


Figure 11: Migration flow between provinces in South Africa, 2021
Source: StatsSA 2021 Mid-year population estimates



ARE WE SETTING OUR SIGHTS ON THE RIGHT TARGET FOR JOB CREATION?

In total, the NDP sees 589 500 of the nearly 1 million jobs being created in the subsistence and small-scale farming space, and through redistribution of land. This may be seeking to maximise the job creation potential from a sector that is known for being labour intensive. However, we also need to consider the kind of livelihoods that could be created and how sustainable these could be in the long run.

The ILO defines decent work as providing quality work that offers dignity, equality, a fair income, and safe working conditions. It is typified as work that ensures people are free from exploitation, and by work in systems that are inclusive and sustainable in future. While subsistence agriculture may contribute to lifting people out of absolute poverty, we need to consider the sustainability of this approach, given that small plot sizes may cause further land degradation and that climate change may make it harder to conduct agriculture effectively on small scale. Moreover, it is not clear that agriculture, without the further linkages that enable farmers to effectively share the market prices, will have the desired long-term effects in lifting people out of poverty.

The view of agriculture as having the potential to lift rural communities out of poverty, is in alignment with sentiments expressed by the World Bank, who states that “Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed a projected 9.7 billion people by 2050. Growth in the agriculture sector is two to four times more effective in raising incomes among the poorest compared to other sectors.”

However, the detailed World Bank report also cautions that increased agricultural production does not automatically translate into poverty alleviation. It cites the example of Zambia, where higher cereal yields did not impact poverty as poor farmers did not have the opportunity to participate in increased yields. “Ensuring that growth has significant impacts on the incomes of the poor is what is needed to end poverty. Linking farmers to markets, strengthening agribusinesses, and generating rural non-farm income can help raise incomes and provide jobs” (Ending Poverty and Hunger by 2030, World Bank, p8).

In addition, land restitution has so far not achieved the desired results. According to the Final report of the presidential advisory panel on land reform and agriculture (p. 11): “Common problem themes ... include the fact that land reform in South Africa has yielded little success in establishing a new generation of sustainable household, small scale and commercial black farmers. The reasons cited include a dearth or absence of security of tenure, a lack of transfer of title deeds for the acquired portions of land to beneficiaries, and the poor post-settlement support system. At the heart of the problem is the poor capability of the State, which is characterised by deficient coordination, limited and misaligned allocated resources (both public resources and private resources, particularly in the finance sector), and further complicated by corruption.”



While South Africa (like the rest of Africa) has a large youth contingent and high youth unemployment rates, the average age of farmers in South Africa is 62 (Sihlobo, 2018). The common perception is that the youth is not interested in agriculture as a career. However, work by Metelerkamp (2019) shows the issue is often with the big gap between back-breaking, economically insecure subsistence agriculture, and large scale agribusinesses that limit their perceived options, rather than a blanket rejection of agriculture as a career. He summarises the disconnect as follows: "They either feel trapped by the poverty, isolation and backbreaking drudgery associated with rural subsistence agriculture, or they face the unappealing prospects of unskilled minimum wage jobs on increasingly industrialised (and often racialised) commercial farming operations ... The bad news is that there aren't enough farmers who fill the space between subsistence agriculture and large-scale agri-businesses. This 'missing middle' leaves young people feeling trapped."



VIEWS ABOUT THE FUTURES OF WORK IN AGRICULTURE

Rapid technological advancement is encroaching into on-farm job creation, with more jobs shifting to the off-farm agri-food chains as countries become more developed. In developed countries, migrant workers have typically filled the vacuum as more locals prefer to opt for jobs off-farm and in cities.

Agricultural jobs have been, to some extent, protected from the widespread automation that is typical in manufacturing. Variable and uneven field terrain and delicate produce has meant that certain jobs have been slow to be automated. However, advances in agricultural robotics increasingly mean that even these hard to automate jobs are now becoming automatable. Smaller scale equipment, like autonomous planting robots are also more environmentally friendly and affordable. At the same time, advances in precision agriculture and data science mean that farmers are becoming more productive with smaller staff complements. Data gathering and measurement means that farmers are more targeted in where their efforts are being directed, making the entire process more efficient.

According to Christiansen et al, agricultural deglobalisation and digitisation are also combining to make it more challenging for emerging economies to use the agricultural pathway to lift populations out of poverty. “Overall, the challenge is to transition to fewer and better paying agri-food jobs—on-farm and increasingly off-farm along the agri-food chains—without causing social havoc and making maximum use of the many employment opportunities agri-food will continue to offer, particularly for youth. This challenge is going to be especially salient in Africa.”

While current production technologies and strategies may form the baseline for continued employment in agriculture, new technologies open the opportunity to access new jobs and markets. These new jobs and opportunities may, however, require specialist technological or scientific know-how, and it is not clear whether the current educational system is adequately preparing the workforce of the future for this reality.

An important feature of technological advances, however, is that it allows us to free the concept of agriculture from the land itself.



MOVING BEYOND THE LAND

The land itself has been a central concept in this study – it fulfils multiple roles that influence our ability to talk about its use objectively. According to Mograbi et al (2020): “Land provides more than just food. For example, flowering plants facilitate crop pollination, wetlands help purify water and trees take carbon dioxide from the atmosphere and thus play an important role in mitigating climate change. Natural land is also important to South Africa’s significant ecotourism sector. For many, land is the cornerstone of their identity. It provides a sense of belonging, an attachment to a place that’s ‘home’ and associated with their culture.”

However, as shown in earlier parts of this study, the concept of land ownership is deeply challenging. It is plagued by issues of land degradation, climate change and land redistribution. Our inability to consider land use objectively, also constrains our ability to approach the issue creatively. Furthermore, with issues of land redistribution being open to both political influence and systemic corruption, land redistribution itself may be adding barriers to employment, rather than alleviating them.



IMAGINING THE MILLION JOBS

While subsistence and small-scale agriculture may create some jobs, and there is no need to abandon current plans or strategies, it seems unlikely to create the number of jobs envisaged in the NDP. With employment in the agricultural sector standing at 810 000 in Q4 2020, it seems clear that the 1 000 000 jobs envisaged by the NDP, is yet to materialise.

If our strategies for job creation have not worked over the past nine years, we need to ask what would need to change to encourage job creation in the agricultural sector. The productive land we have is precious, and it needs to be put to optimal (which includes the concept of sustainable) use. Land restitution will remain important, precisely because it is not just about land – it is also about identity and heritage. However, our ability to overcome the current impasse will be dependent on our ability to think in innovative ways.

Five aspects stand out:

- Without a sustainable, climate aware strategy, any agricultural strategy will be a non-starter.
- Embracing new strategies will mean considering the entire agri-value chain.
- Technology gifts us the ability to farm efficiently, with minimal land use.
- The kind of jobs we need to create will be different, but they may be more ‘decent’ jobs.
- The key may be in unlocking economic linkages, creating infrastructure, and optimising efficiencies.



ALTERNATIVE FORMS OF AGRICULTURE MAY APPEAL TO THE YOUTH

While 'tilling the land' may sound romantic, the reality is that this will be a primary occupation for fewer people in future. However, this is not necessarily bad news – off-farm jobs, or jobs in different parts of agricultural production, may arguably be more aligned to the ILO's vision of providing 'decent work' and may appeal more to the youth.

Vertical farming typically allows one to produce crops with between 70% and 95% less water than what is required under normal agricultural conditions, in much smaller spaces, and even in cities. The controlled climatic conditions also mean less (or no) use of pesticides. There are limits to the kind of crops that can be produced in this manner, and while vertical farming may initially have been more associated with vegetable cultivation, the technology is now being expanded into fruit farming (Growingproduce, 2021).

Aquaculture can help to meet the protein needs of a growing population, even using land in arid areas to raise fish and other aquatic animals. Aquaculture often requires that some processing takes place before produce can be shipped to markets or exported, offering further linkages in the production chain, and offering the ability to add value to farmed goods.

Projects aimed at restoring degraded land, can not only offer job creation opportunities in the short run, but can also restore land to productive capacity in the long run, enabling sustainable futures and can assist in combating climate change (Liu, 2012).

Expansion of South African agriculture into new markets or gearing current sectors for export, is hamstrung by poorly developed internal economic linkages. Focusing on ensuring that the necessary infrastructure is in place, and that the necessary forward and backward linkages are suitably established to grow industries that have high potential, is key. This can enable these industries to expand further, employing more people in the process. Examples include high fish feed prices limiting aquaculture profitability and expansion (Pereira, 2020), and insufficient abattoirs able to slaughter swine and a shortage of veterinarians limiting the growth of the pork export industry (Rooney, 2020).

Farms that rely on more advanced technological methods will need to employ more highly skilled individuals. This will require investment into agricultural education, skills and training, as well as investment into adjunct fields, such as climatologists, to improve the current measurements available.



Barriers to Employment in Agriculture

Multiple barriers to employment prevent the sector from reaching its full potential as an employer. Barriers are presented here as one-liners and, for organisational ease, in a PESTEL format. This arrangement does not negate the fact that different elements within the various sub-sections inevitably interact with elements within and across other sub-sections.

BARRIERS FROM THE POLITICAL ENVIRONMENT

- Practices of the Departments of Agriculture, Land Reform, and Water Affairs are not always aligned with global best practice.
- Policies are often driven by ideology, rather than by science, risk mitigation, or best practice in responding to changing realities.
- Corruption and mismanagement of resources are widely prevalent.
- The deterioration of infrastructure has a significant impact on the agriculture sector, especially with regard to water channels, water catchment areas, roads, ports, air transport infrastructure.
- The efficiency and competency of institutional services rendered by the police service, Transnet, SA Port Services, SA Post Office, Agri Field Services, are deteriorating.
- Misaligned and unintegrated plans and policy rollouts lead to wasted resources and time.
- Export opportunities may be hampered by failed/non-existent negotiations through diplomacy in BRICS and other countries.
- Uncertainty regarding land reform.
- Departmental and inter-departmental failures result in policy paralysis.
- Not all politicians have a sufficient appreciation for the business and the science of agriculture.
- Inefficient local government impede the socio-economic development of rural towns.
- Geopolitical tensions and instability in Sub-Saharan Africa poses a threat to agricultural markets in the region and to business stability in general.
- Institutional incapacity to manage waste streams and pollution has a direct bearing on those resources (e.g. land and water) which form the basis of primary agriculture.
- Protectionism influence access to traditional export markets.



BARRIERS FROM THE ECONOMIC ENVIRONMENT

- Some state institutions involved in financing agricultural initiatives, in particular the Land Bank, have financial challenges.
- Funds to finance a labour transition are not deployed, and in some cases, not planned for.
- Some markets are suffering, and even collapsing, as a result of political instabilities, overproduction in certain geographical areas, and unregulated agri-product dumping in other areas.
- The overall cost of labour is high.
- Instability in the supply of electricity, combined with rising energy costs influence not only profitability, but also R&D in agriculture.
- In some areas, arable land for farming is becoming very expensive.
- The cost of water management and water as an input resource is increasing, mostly as a result of the erosion of the state capacity for water system management and the maintenance of water infrastructure.
- Low levels of economic growth create a challenging business environment for agri-businesses.
- R&D investment in South Africa is below global norms. In the absence of adequate local R&D, innovative products and services have to be imported at a high cost.
- Extreme Rand volatility has a negative effect on price stability and causes fluctuating input costs, and turnover.
- There is a chronic shortage of appropriately skilled labour.
- The shadow economy in South Africa is growing; organised crime syndicates are active in the agricultural sector as well.



BARRIERS FROM THE SOCIAL ENVIRONMENT

- Many jobseekers do not have appropriate skills, mainly as a result of our sub-par secondary school system.
- Service providers for Adult Basic Education and Training (ABET) are not sensitive to the realities of rural areas, and facilitators for the delivery of ABET are not readily available in many areas.
- There is a misalignment between education syllabi and the needs of the agricultural sector.
- Peri-urban sprawl has an influence on peri-urban agriculture.
- The 'Feed SA first' social policy needs to be managed in a responsible manner in order to find a balance between job creation and food security.
- Demographics influence social policy, and political election cycles tend to create short-termism and 'fixes-that-fail', because it leans toward where the voters are, rather than toward the long-term well-being of the agricultural sector.
- The activities of drug syndicates and the levels of drug abuse are increasing at an alarming rate in both urban and rural areas; this has a negative impact on general levels of safety, and social stability.
- Deteriorating social cohesion in South Africa has a negative impact on the agricultural sector as a whole, and on employment within the sector in particular.
- Migration inflows from the rest of Africa contributes to the complexity of societies. Furthermore, a 'grey employment' sector that employs undocumented migrants, especially for on-farm jobs, is growing.
- Knowledge transfer in agriculture, especially about on-farm activities, is intense and requires significant portions of time. In many cases, this knowledge transfer happens from one generation to another and may be the difference between success and failure on the farm.



BARRIERS FROM THE TECHNOLOGICAL ENVIRONMENT

- Mechanisation and automation are global megatrends that may displace many jobs in the agricultural sector.
- The shortage of engineering skills in the SA agricultural sector comes at a great cost for local R&D and the development of localized technologies.
- Inefficient governance acts as a barrier to the implementation and adoption of certain technologies (and the potential job opportunities that comes with the adoption thereof).
- Lack of efficient and affordable communications infrastructure hampers the adoption of precision-farming. Potential jobs 'lost' in this way are drone operators, spatial monitoring technicians, carbon capture analysts, IoT technicians, etc.
- Inefficient and inconsistent management and protection of Intellectual Property within the agricultural sector may deter potential participants.



BARRIERS FROM THE ECOLOGICAL ENVIRONMENT

- South Africa is a water scarce country, and droughts are a common occurrence. Employment levels in the agricultural sector tend to decrease during times of drought.
- Climate change may have a profound impact on certain areas in South Africa, with a knock-on effect on employment in agriculture.
- In some areas, soil quality is deteriorating as a result of low rainfall, intensive farming practices, and ecological neglect.
- The national water system is under pressure from pollution, and the misalignment of water management strategies.
- Regional water conflicts may have a negative influence on agricultural activities.
- Buy-local and reducing carbon footprint initiatives in South Africa's traditional export markets, may have a negative influence on the ability to export our agricultural produce.



BARRIERS FROM THE LEGAL / REGULATORY ENVIRONMENT

- In agriculture, market access is of utmost importance. Inefficient regulatory measures may complicate it.
- Flawed tariff and accounting structures create uncertainty and the potential for corruption where non-compliance become the norm. Water tariffs in the agricultural sector is a good example.



Scenarios

Following on the analysis above, the IFR convened a scenario work session on 31 May 2021. The workshop included representatives from the agricultural sector, government, and research associates from the IFR and the non-agricultural sector, to help ensure the inclusion of broader and more diverse perspectives. The input from the previous briefing sessions, workshops, the scan, and research on the barriers, were used as inputs during the scenario creation process. The process to craft the scenarios is outlined in more detail in the graphic below.



Figure 12: Process followed to develop the scenarios

FUNDAMENTAL PRINCIPLES OF FUTURES THINKING

Futures thinking does not aim to predict the future. Rather, foresight is about understanding how multiple futures could evolve from the current situation and determining what you could and should do in order to co-create a desired future.

Furthermore, societal change is a holistic and systemic process. Multiple perspectives are needed (economic, physical, technological, institutional, political, social) to inform initiatives. Complex systems (like the agricultural sector) have a large number of individual actors that interact with each other, aiming to achieve unique goals. Actors are often ignorant of their influence on the rest of the system or the long-term effects of their actions. There are multiple dimensions to human development and aspirations to consider.



Scenarios are extremely useful when the number of factors to be considered and the degree of uncertainty about the future is high, such as the case when it comes to agricultural employment in South Africa. Scenarios provide snapshots into various possible futures, and as such provide valuable input into strategy creation, and in shaping a preferred future.

UNDERSTANDING SCENARIOS

Scenarios are not predictions: rather they are multifaceted, holistic sketches or outlines of plausible futures. They help us to cope with the uncertainty of the future, contribute to stimulating strategic thought and communication, improve internal flexibility of response to environmental uncertainty, re-orientate policy options, and lead to better decision-making.

A scenario describes a possible future situation, including paths of development that may lead to that future situation. A scenario is not a comprehensive image of the future; its function is to direct attention to one or more specific, clearly demarcated segments of reality. Scenarios aim to generate insights regarding future developments through observation of relevant key factors.

Scenarios are based on a range of assumptions about how the future might look one day. These assumptions evolve throughout the scenario development process. They include assumptions about the direction that certain trends may take, and about which developments could remain constant or may change over time. Scenarios have multiple functions. Some organisations use scenarios to explore the future and build some knowledge about what could possibly happen in the future or to communicate their views about the future. For others, the function of scenarios is goal setting. The role that scenarios play in decision making and strategy formulation makes them indispensable within most current contexts.



IDENTIFYING THE DRIVERS OF CHANGE

During the stakeholder workshops, participants identified a wide-ranging list of the drivers of change that could influence the futures of agricultural employment toward 2035, and assessed each driver according to its level of uncertainty.

DRIVERS OF CHANGE WITH LOWER LEVELS OF UNCERTAINTY

- Short-term vision, not thinking and planning long-term
- Availability of export markets (beyond Africa)
- Rise of urban farmers
- De-urbanisation as a result of changing world of work (looking for local supply of food products)
- Influence and use of blockchain
- Influence of the AfCFTA
- Technology; the adoption of data-driven technology, using it for decision-making
- Popularity of labour-intensive crops
- Increased adoption and practice of precision farming
- Capacity to leverage – role of commercial banks and policy/regulatory certainty
- Increased focus on agri-processing
- Influence of climate change
- Resource availability/scarcity
- Access to capital
- Access to insurance
- Management of waste throughout the supply chain
- Success in shifting of perceptions – cannot keep on calling black farmers emerging farmers
- Availability of micro-credit and micro finance
- Rise of craft market based on agri-products, especially in rural areas
- Consumer behaviour, more ethical, adding to the regulatory process
- Outcomes of national elections
- Realistic expectations about potential jobs available in agri
- Adoption of biotech
- Tension with conservation – human/habitat interface
- Innovation, how do we not miss opportunities, how do we support it and invest in the right innovations



DRIVERS OF CHANGE WITH HIGHER LEVELS OF UNCERTAINTY

- Ability to change aspects of culture and ideology around agriculture
- Managing the gap between mega farmers, commercial and subsistence farmers
- Efficiency of Public-Private Partnerships
- Land expropriation: more certainty could reduce noise, resulting in more investment, SA becoming an investment destination
- Influence of counter movements: anti-GM, turning toward indigenous knowledge, small batch farming
- Social stability, especially in rural areas
- Success of social transformation initiatives
- Empowerment of women in rural areas
- Appropriate and efficient education and skills development; agile skills transfer
- Efficient water management
- Establishment, management, and maintenance of infrastructure (connectivity of roads, rail, etc.)
- Developing the potential for micro-processing
- Focus on building sustainable rural communities
- State of the South African economy
- Policy and regulatory focus
- Role and capacity of major players in the agri sector (divergence between state and private capacity)



THE KEY UNCERTAINTIES

Further consultations and deliberations led to a refinement that resulted in a list of key uncertainties.

- **Global protectionism:** The extent to which South Africa faces tariff and non-tariff barriers, as lower barriers could increase opportunities for export.
- **Commercialisation of subsistence farming:** The extent to which subsistence farmers could be connected with markets, and encouraged to participate in market activity, as successful connections could increase farmer revenue, employment, and build stronger networks.
- **Composition and structure of the market:** The extent to which the number and spread of large, medium and small enterprises (SMEs) across the agri supply chain could be optimised, as a stronger SME presence could facilitate more job creation.
- **Social stability in rural areas:** The extent to which rural areas are socially stable and well serviced, because stable rural areas could facilitate continuity of production and access to markets.
- **Tenure of employment:** The optimisation of employment tenure (permanency) because permanency of employment could increase employee welfare and contribute to the attractiveness of the agri sector as potential employer.
- **Attractiveness of agri-employment:** The attractiveness of employment in agriculture, because an established reputation could increase the number and quality of students committing to tertiary education and seeking employment within the sector.
- **Learning agility:** The ability of firms and individuals across the supply chain to quickly adopt new knowledge, because an agile workforce may innovate, diversify, invest more efficiently and employ more people.
- **Proper infrastructure/logistics:** Sufficient and well-maintained basic infrastructure, because well-maintained logistics, energy, and communications infrastructure could facilitate continuity of production and enable efficient access to markets.
- **Managed land expropriation:** The extent to which land redistribution and food production optimisation could be balanced, as such a balance could minimise interruption, protect food security and jobs.
- **State capacity:** Government's capacity to (i) execute services (e.g. in relation to trade affairs, port authorities, veterinary services, biosecurity control and plant health) and (ii) enforce appropriate regulations (e.g. to prevent abusive market conduct, limit land erosion, encourage climate-sensitive processes, and facilitate guided land redistribution) is important, as proper execution serve to bolster investment and may result in increased opportunities for employment in the agri sector.



CRAFTING THE SCENARIOS

The 10 key uncertainties listed above, were further analysed, using an impact analysis tool. The influence of each factor on each of the other factors was considered and scored by the workshop participants. This type of analysis provides both an active and a passive score for each factor. The active score indicates how strongly that factor influences all the other factors, while the passive score indicates how strongly that factor is influenced by all the other factors. Different combinations of active and passive scores point to different types of behaviour that could be expected from factors:

- **Buffering factors** have low active as well as passive scores; they have a low influence on the other factors and are weakly influenced by them. These factors are usually 'in plain sight' but decision makers should accept that these factors will not be the driving factors. In fact, these factors usually deplete resources invested in it without generating major changes in the rest of the system. In this analysis, the level of global protectionism is a buffering factor.
- **Reactive factors** have low active scores, but high passive scores. This indicates that they exert a weak influence on the other factors, but are strongly influenced by other factors. In a system, the reactive factors are useful indicators of the effect of interventions – when the reactive factor starts to show change, it means that the other factors are changing, or interventions are working. In this analysis, there were four reactive factors: Social stability, tenure of employment, reputation of agriculture as employer, and effective infrastructure and logistics.
- **Active factors** have high active scores, but low passive scores. It indicates that they have a strong influence on other factors, but are weakly influenced by the other factors. Active factors make effective levers; it may be possible to have a significant effect on the system through intervention. In this analysis, managed land expropriation is an active factor.
- **Critical factors** have a high active as well as a high passive score. A critical factor has a strong influence on other factors and is strongly influenced by the other factors. Observers and planners should keep track of changes in the status of critical factors at all times, and use these factors to influence the system. These factors often form either virtuous or vicious circles. In this analysis, the commercialisation of subsistence farming and state capacity to execute services and enforce appropriate regulations are critical factors. However, the two most critical factors were the composition and structure of the market, and appropriate skills and learning agility. These two factors were used as the axes for the set of scenarios.

The composition of the market: The extent to which there is a balance between mega, small and subsistence farmers and other enterprises within the agri sector.

Appropriate skills: The extent to which potential and current participants possess relevant knowledge and proven abilities. It also includes extent to which knowledge transfer is appropriate and successful.



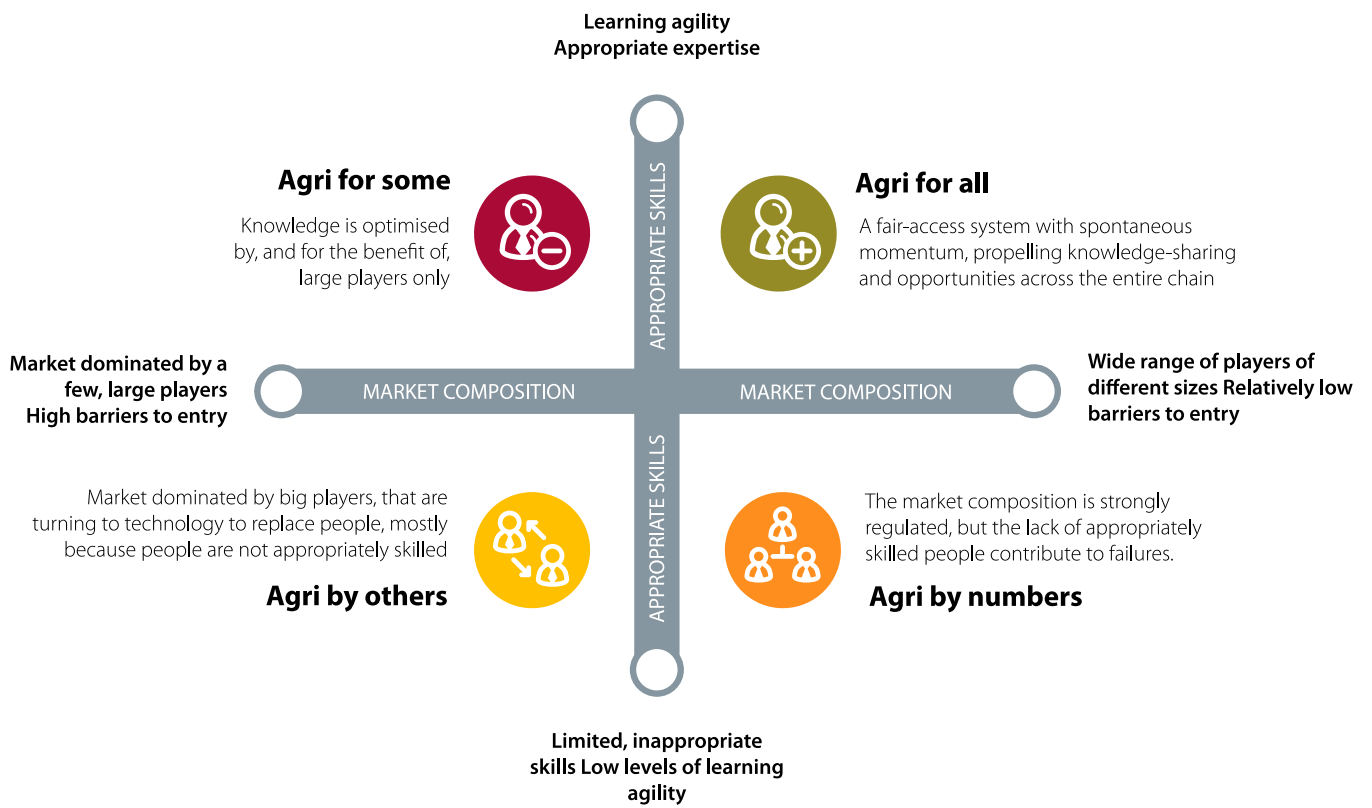


Figure 13: Scenarios - futures of agricultural employment in South Africa in 2035



DETAILS OF EACH SCENARIO

AGRI FOR SOME

The Agri for some scenario is characterised by a polarised market structure. There are a few smaller players, but the larger players dominate the scene. There are quite high levels of skills agility, but knowledge transfer is mostly taking place between established firms, and they use it to their own advantage only, to become even more powerful.

Under this scenario, while serious attempts were made in the early 2020s to ensure that the agri sector was transformed, delays with the implementation of structural transformation and the introduction of more SMEs, served to derail the project. Collaboratory governance were being prioritised in principle, but not implemented, because of the delay in the implementation of the structural transformation interventions.

Delays in the unlocking of bottlenecked capacity

In this scenario, there were significant delays in initiatives that were aimed at unlocking bottlenecked capacity. In fact, delays in any one of the initiatives could have created the opportunity for this scenario to develop.

- Land restitution: legal instruments pertaining to land restitution were finalised, but the provision of land parcels to claimants and claimant communities were significantly delayed.
- Competition commission interventions: The Competition Commission delayed the implementation of a market inquiry into the food value chain due to competing priorities and a reduced budget post Covid-19. Upon the completion of inquiry years later, the Competition Commission's recommendations took a very long time to be implemented due to the complexity of the recommendations and/or competing national priorities. The Competition Commission enforced the Buyer Power Regulations and Buyer Power Guidelines through advocacy work, and imposed remedies in terms of which SMEs had to be assisted. However, the impact of such remedies in an untransformed industry (caused by the delay in the implementation of the market inquiry recommendations) remained limited and isolated. Little dynamic momentum existed in relation to the establishment of a strong SME agri sector.
- Delays in the transformation of 'land' and 'opportunity' into actual capacity. Negotiations between government, finance institutions and trade associations were delayed, and government struggled to meaningfully increase the supply of physical resources in targeted areas. Years later, small scale farmers occupied some portions of planted land. Delays with the recapitalisation of state-owned production, and with the re-establishment of damaged areas, further stifled the expansion of production.



- Delays in the exploitation of additional production capacity. The implementation of the DTIC's Master Plans (originally aimed for the early 2020s) were delayed because some stakeholders executed legal action against the DTIC. It was argued that the Master Plans were implemented in conflict with the PAJA and/or international trade agreements. Protracted court proceedings followed, and some corrective measures were imposed. Other African countries became involved. After years, amended Masters Plans were executed. Due to the time delay, markets had become increasingly concentrated. The remaining SMEs had been acquired by larger firms employing state-of-the art technology. The high degree of concentration rendered the adjusted Master Plans less effective in the creation of a strong middle ground of SMEs.

Agile learning between large players only

The large firms across the agri chain continued with the sharing of knowledge among themselves, including large international firms. Best practices and solutions were quickly consolidated and shared between stakeholders. Solutions were optimised. RDI remained a priority. Large players became more successful, both locally and globally. The SME sector's participation in the chain remained small and dispersed. Successful and innovative SMEs were acquired by larger firms. The polarised structure of the market increased.

Large firms monopolising new markets

Due to significant delays across a number of steps in the structural transformation project, the large firms exploited opportunities in the upstream, downstream and new markets.

- For example, through forward integration, they exploited opportunities in the forestry industry, by diverting timber away from some customers so as to exploit prevailing opportunities in the pole, sawmilling, pulp, paper, bio-refinery, board manufacturing, construction, and furniture markets. In the sugar industry, they invested into the production of biofuels, animal feeds, alcohol, electricity, and chemicals. In the poultry industry, they targeted the export markets of Europe and America, after having obtained the necessary sanitary and phytosanitary protocols.
- Similarly, through backward integration, the larger firms established contract farming franchises having exclusive supply agreements with the large producers. Furthermore, they established crop feed as well as seed and fertiliser production plants, and entered into prolific export agreements with a number of African countries.



The established firms from 2021 were the first to commercialise and scale:

- off-land food production facilities
- vertical food production
- food technology and agri-processing technology
- weed markets in areas like the Western Cape
- agro-forestry systems
- value chains from waste wood biomass based on biorefinery technologies
- value streams in the sugar industry, e.g. bioethanol for fuel blending, biojet fuel, potable, industrial and pharmaceutical-grade bioethanol, biomass or co-generated electricity, biogas, and no- and low-calorie sweeteners.

Job creation in this scenario

Although various new markets had been created, the job opportunities related to such exploitation were relatively few because of the technologies and shared services models employed by the established players. More importantly, their first-mover advantage resulted in the securing of monopolistic positions in the markets, complicating new entry.

In addition, retrenchments occurred in the industry, as small firms were acquired by large, technology driven firms, while some of the large local firms became the target for international takeovers.



AGRI BY OTHERS

In South Africa today, the 2035 agri sector is one where the market structure is highly polarised, with a number of large players dominating the scene. Furthermore, large international firms are making inroads in the sector through both greenfields initiatives as well as acquisitions of local entities. The majority of job seekers do not have the required skills, and skills agility within the sector is low, mostly as a result of low levels of knowledge-sharing among market players, and the firm belief that existing knowledge systems are sufficient.

Delays in unlocking bottlenecked capacity

Similar to the Agri for some scenario, the early 2020s saw planned initiatives, but significant delays in the implementation of:

- land restitution
- competition law recommendations pursuant to market enquiries
- the transformation of 'land' or 'opportunity' into actual capacity
- the utilisation of additional production capacity.

Due to the delays in implementation of the initiatives, the SME sector remained small and dispersed, and the agri sector shed many jobs.

Learning, skills development, and skills transfer remain isolated

Looking back from where we are in 2035, over the past decade, large local firms did not prioritise knowledge creation and RDI to the same extent as international firms. Isolated pockets of knowledge existed, but ideas were not ventilated. Efforts to gather and consolidate new learnings were not prioritised. Government remained largely absent from skills development in the sector.



International firms made inroads into the South African agri sector

Due to the significant delays in SME creation, and a lack of knowledge-sharing by the established players in the value chain, large international companies saw gaps across South Africa's agri supply chains. They entered the local market through greenfields initiatives, by acquiring existing businesses, or by contracted imports.

Opportunities on and off farms were now reaped by international firms (not the established local firms). Where acquisitions of large firms were involved, the mergers were approved subject to significant public interest conditions e.g., short-term moratoria on retrenchments and local sourcing obligations (to the extent that the resources were available in the local market). Where acquisitions of smaller local firms were involved, the merger notification thresholds were not met, and numerous workers were retrenched.

Job opportunities

Job creation from SME development remained absent due to the delays in the SME expansion project. Entry by international firms, whether through greenfield initiatives, by the acquisition of existing operations, or by contracted imports, served to limit the shedding of some jobs over the short term. However, retrenchments occurred elsewhere in the value chain as small firms – not meeting the merger notification thresholds – were acquired by large, technology driven firms.

Today, even if job opportunities become available in the agri sector, local people do not have the required skills to fill those positions. Many activities that could have been performed by people are automated, because local people do not have the required skills, and technologies are maturing to the extent that it becomes more efficient and affordable to adopt it rather than try to develop people's skills. Automated systems are managed from international locations.



AGRI BY NUMBERS

The 2035 South African agri sector is characterised by a market structure with a middle ground of SMEs; but there is little cross-market integration, resulting in little collaboration and knowledge-sharing between firms to the detriment of the sustainability of SMEs. The low levels of agility in developing the appropriate skills cause significant constraints.

During the early 2020s strong-hand regulatory intervention led to the establishment and inclusion of large numbers of small and medium sized enterprises in the agri value chain. During these times, some pockets within the sector became more productive. However, here in 2035, relatively little consultation with market players is taking place. Larger businesses are securing its own interests and they remain territorial and inward-focused regarding their knowledge advantages. The combination of these developments result in SMEs with a short lifespan – they are established as a result of the regulatory interventions, but struggle to survive because accessing and retaining people with appropriate skills are near impossible.



The unlocking of bottlenecked capacity via strict enforcement of regulations

- Land restitution. Legal instruments pertaining to land restitution were finalised and implemented and land parcels were provided to claimants and claimant communities in good time.
- Market inquiries. Between 2023 and 2025, the Competition Commission conducted a number of market inquiries in the food value chain. They adopted a strict legal stance, continuously reserving all rights to initiate complaint investigations. Market players participated with caution and did not volunteer much information. Little trust existed between the Competition Commission and business. Still, the Commission's recommendations impacting the regulatory and institutional spheres were implemented in good time.
- Buyer power rules. Large firms were prosecuted for abuse of buyer power and remedies aiming to create more SMEs in the short term were imposed. However, longer term survival of the SMEs was not prioritised, and it was further complicated by the low levels of appropriate skills available.
- Impact studies were conducted. However, they were based more so on cross-section analyses (as opposed to time-series analyses) i.e., focusing on the number of SMEs created in certain sub-markets pursuant to interventions. The studies painted a positive picture of the rate of structural transformation. They prompted additional forced mechanisms to be introduced. However, the long-term sustainability of the new SMEs was not considered. The actual business environment in which SMEs had to operate, was not assessed, or influenced.
- Other measures. While the Competition Act was amended from time to time, and additional industries were designated, the purpose of more interventions was to make it easier for the Competition Commission to win cases, or to impose further remedies aiming to create more SMEs (in number). The focus was on perceived structural transformation and not so much on an environment that was inherently conducive to organic SME growth. Merger conditions focused on outcomes, not processes, to the detriment of not only the SMEs, but the agri sector as a whole.

The transformation of 'land' or 'opportunity' into capacity

In this scenario, an increase in the supply of physical resources (e.g. forestry or sugarcane plantations) were achieved in targeted areas. However, due to limited buy-in and consultation in the industry, little spontaneous knowledge-sharing occurred. The burden of rendering extension services to new landowners was solely on government. Because demand outstripped supply, some SMEs did not receive appropriate assistance



Outcomes of initiatives to develop additional production capacity

Good intentions, significant investments, and strict regulations since 2022 did not lead to the thriving sector that was envisaged.

- Long-term contracts for only a select few SMEs. To ensure the sustainability of SMEs who had entered the market, large firms were encouraged to enter into supply agreements with SMEs. Due to low levels of buy-in by large firms, and a lot of scepticism, they chose to partner with the most efficient SMEs as partners and imposed strict performance measures. Various SMEs were excluded from these long-term agreements because, due to the lag in the rendering of extension services by government, they were not production ready. Having lost this initial advantage, these SMEs never fully recovered in relation to their competitors; nor did they become part of production and processing networks.
- Many SMEs fail due to a lack of readiness. While small player survival was prioritised during the implementation of the Master Plans, their lack of readiness to operate in the market (due to a lack of extension services) caused some of the SMEs to fail over the longer term. Only the SMEs that were already fairly efficient remained in the market. However, even these SMEs struggled under the initial conditions associated with the early unstable phases of some of the Master Plans. Retrenchments followed. Retrenched employees struggled to re-enter the job market.
- In many masterplans of the early 2020s, there was a strong focus on the proliferation of SMEs. It enabled renewed efforts to assist struggling SMEs and support entrepreneurs during the establishment of new SMEs. However, their relatively late entry into the market, the lack of appropriate skills, and the large degree of rivalry in the market, made them uncompetitive over the longer term, leading to demise for some, and acquisition by stronger players for others.
- Some of the more efficient firms performed well and created seasonal jobs in rural areas. However, such jobs were not sufficient to have a positive effect on rural stability. In fact, the seasonality contributed to social instability during both in-season and off-season times, albeit for different reasons. Moreover, as some SMEs struggled to successfully enter the market (due to a lack of extension services), social conditions deteriorated and led to regular unrest.
- The benefits arising from state interventions were not shared with the participants in the chains as intended by the master plans, because government decided that the funds ought to be utilised for the creation of more SMEs, or the rendering of extension services to SMEs. Large firms, that had invested much in meeting their Master Plan targets at a great cost, decided to withdraw from the process and to deliver only the minimum targets under the Plans. Loopholes were exploited and more lucrative opportunities were sought. Some of the large firms instituted legal action against government on the basis that the Master Plans violated international trade law obligations.



Absence of agile learning

The single largest shortfall in this scenario, is the absence of agile learning. There are three factors that contributed to the low levels of agile learning that we see here in 2035.

- Relatively little consultation with market players took place throughout the implementation stages of planned interventions (e.g., the Competition Commission's market inquiries or the DTIC's Master Plans).
- Market players secured their own interests and remained territorial in relation to their knowledge advantages; they did not sufficiently trust the process to share knowledge and resources with smaller firms.
- Collibratory governance was prioritised, but the variables and tests selected for the conducting of impact studies encouraged short termism and not the sustainability of SMEs.

The lack of industry buy-in resulted in minimal knowledge-sharing. Isolated pockets of knowledge existed across the agri sector. But, these knowledge advantages were fiercely guarded. Where the Competition Commission or the DTIC imposed remedies requiring that some knowledge be shared with SMEs, the minimum sharing took place. Over time, as it was clear that the Master Plans did not reap sufficient rewards, business started to prioritise unilateral action that served their own interests and undermined (i) the prospects for the successful implementation of the Master Plans as a whole, and (ii) the ability of other parties to deliver on their commitments.

Looking back from 2035, market players agree that four things, that were planned but did not come to fruition, could have made a difference:

- The establishment of centres of excellence by multi-disciplinary associations
- Collaboration between government and business on the rendering of extension services to new SMEs
- SMEs being assisted with worker reskilling and redeployment
- Companies actively investing in RDIs.

Government placed no emphasis on the incorporation of catalysts in the supply chain aiming to ensure spontaneous self-organisation and market "creation". Although oversight structures were adequately resourced, their lack of meso-economics skills rendered governance ineffective. Course-corrections were identified, but only years after the initial Master Plans had failed. As a result, investment and employment creation stagnated.



Pockets of expansion across the agri supply chain

During the mid-2020s, much focus was placed on the development of upstream, downstream, and new markets. Although new opportunities were developed, it was mainly done by a couple of established large and SME firms – not by the new firms in the industry. Although the successes of these established SMEs were used as proxy for the success of the structural transformation project, deeper structural issues remained neglected.

Over time, successful SMEs were acquired by larger organisations. The mergers did not meet the thresholds for compulsory merger notification and the Competition Commission did not have a chance to impose competition or public interest remedies on the merging parties. Many workers were retrenched as a result.

Job creation

Initially, job creation increased, and parties were quite excited about it. However, over the longer term the new SMEs that were established through industrial and competition interventions (and seemed to create more jobs) failed as a result of the lack of business support. Furthermore, the larger players acquired the successful SMEs and retrenched most of those SMEs' workers.



AGRI FOR ALL

The agri sector today in 2035 is one with a rich market structure; one where there is a well-balanced mix of larger and smaller players with appropriate, agile skills. Looking back to the early 2020s, there is significantly higher levels of commercial activity as well as job creation throughout the sector.

- From a market structure perspective, the vibrant agri sector was influenced by:
- The successful unlocking of bottlenecked capacity, mostly via regulation
- The successful transformation of 'land' and 'opportunity' into actual capacity
- The successful utilisation and development of the capacity
- The successful development of upstream and downstream opportunities as well as the establishment of new markets

From a skills agility perspective, the vibrant agri sector grew from:

- The DTIS / Competition Commission that engaged positively with stakeholders to promote continuous buy-in and knowledge-sharing between large and smaller market players; a culture of trust and reciprocity is prevalent here in 2035
- A workforce with positive attitudes toward learning new skills
- The successful optimisation of increasingly higher and higher planes of productivity through the principles of meso-economics
- The successful implementation of collaborative governance, i.e. the governance of governance



The successful unlocking of bottlenecked potential

A number of initiatives that started as early as 2022, contributed to the unlocking of bottlenecked potential in the sector.

- Legal instruments pertaining to **land restitution** were finalised and implemented and land parcels were provided to claimants and claimant communities in good time.
- The Competition Commission launched a number of **market inquiries** into different areas of the food value chain. The inquiries were launched based on concerns related to bottlenecks, prohibitive standards, and exploitative conduct in the food value chain. In the process, the Competition Commission actively and positively engaged with relevant market players. Fruitful and trusting relationships were established. Buy-in was achieved. Workable recommendations were proposed, which was implemented in good time. Government collaborated with research institutions to monitor progress with reference to key indicators of structural transformation, co-determined by industry players. Where necessary, direction was changed with the buy-in of key stakeholders.
- The Competition Commission enforced the **Buyer Power Regulations and Buyer Power Guidelines** through advocacy work and alternative dispute resolution (as opposed to litigation) and achieved spontaneous buy-in from the large players. Rapid market repair was achieved pursuant to contraventions. Instead of imposing fines, contraveners were required to assist smaller enterprises with specific challenges. Most large players became attuned to the fair treatment of small suppliers and adopted fair practices.
- Pursuant to the successful implementation of the Forestry Impact Study, more **impact studies** were conducted. The studies constituted sincere attempts to determine whether the Competition Commission's analyses were correct based on market outcomes. The Competition Commission's recommendations became increasingly sophisticated and progressively focussed on interventions promoting self-organisation. This resulted in the positive effects of interventions continuing long after such interventions had technically come to an end. Results from interventions were closely tracked and continuously tweaked in order to achieve this outcome. Interventions designed for self-organisation led to the spontaneous "creation of competition" in the agri value chain.
- **Designation and exemptions.** The Minister of Trade, Industry and Competition designated industries in terms of the Competition Act subject to appropriate conditions. This paved the way for the implementation of restructuring plans. Where necessary, designation and plans were extended. The Competition Commission granted exemptions to smaller players wishing to obtain short-term competitive advantages in order to reach critical mass. The Competition Act was appropriately amended from time to time to encourage rapid market repair where bottlenecks were identified.
- Where required, the Competition Commission imposed **merger conditions** making provision for deliberate pro-competitive actions by the merging parties to encourage the development of SMEs along the agri value chain.
- Exclusionary conduct. Practices and standards in the industry – and their impact on the development of smaller enterprises – were effectively addressed by the Competition Commission and unnecessary inhibitors were removed.



The successful transformation of 'land' and 'opportunity' into actual capacity

The IDC partnered with relevant industry associations and increased the supply of physical resources in targeted areas. Due to successful land reform, small and emerging players managed to secure a much larger proportion of the land available for production, compared to 2020. The recapitalisation of state-owned production, and the re-establishment of damaged areas, also created more capacity for SMEs. Extension services were provided to small growers over time. Ancillary production facilities like mills and processing plants were upgraded to accommodate a larger throughput.

The successful development of additional production capacity

Five factors were pivotal in the successful development of additional production capacity.

- **Long-term supply agreements.** Some of the large, vertically integrated suppliers as well as government and other local buyers entered into long-term supply agreements with SMEs and HDP firms. Efforts were made to incorporate SMEs into local production networks. They managed to explore new markets and to expand production.
- **Small players were protected during the initial stages of Master Plan execution.** Care was taken to ensure that small players were not disadvantaged during the implementation of the Master Plans (or other stabilisation and restructuring plans). Where necessary, the execution of plans was adjusted to ensure the survival of small players. The social partners were committed to save jobs over the long term, and pooled resources to develop alternative work arrangements in the short term (like job-sharing and or shorter workdays) where required. This resulted in (i) thousands of employees being retained for the job market under challenging circumstances, and (ii) their complete reincorporation into the labour market upon the increase in demand across the supply chain.
- Efforts were made to **support small players after their initial establishment** e.g., through the provision of extension services, financial support, and preferential procurement pricing. This enabled growth and economies of scale. Where necessary, specific Master Plans addressing the proliferation of SMEs were established based on their specific cost-structures and challenges. The foundational role of independents in the value chain was acknowledged and protected.
- **Large players operated strongly.** Strong private sector growth facilitated spontaneous transformation, particularly in rural areas, promoting more social stability, which in turn enabled a more business-friendly environment.



- **Equitable sharing of benefits.** From time to time, the benefits arising from state interventions (e.g. implementation of Master Plans) were shared equitably and appropriately between all stakeholders - large players, SMEs and consumers alike. Such equal sharing ensured the continued participation of all players in interventions.

Appropriate skills and agile learning

The agri sector of 2035 is one characterised by agile learning. It was achieved through the continuous updating and sharing of knowledge between industry players, combined with an iterative process of continuous optimisation and consolidation of industry know-how, resulting in increasingly higher planes of productivity. Looking back to the journey from 2021 to today provides a good example of emergence economics at its best.

Based on trust and positive engagement, **market players assisted each other with knowledge acquisition and sharing.** Centres of excellence were established, and they curated and shared important knowledge. Annual innovation expo's were held. Players across the supply chain collaborated on the rendering of business support programmes, extension services and mentoring services to new landowners and SMEs. They also assisted with worker reskilling and redeployment.

A large number of students were recruited for agri studies and more graduates were retained for industry, government, and academia. Curricula were amended from time to time to ensure an appropriate fit between the demand and supply of knowledge in the workplace. Companies continually invested in research, development, and innovation (RDI) in collaboration with government and academia.

The frequent sharing of knowledge led to the fast and unorganised development of the market at first. However, dedicated efforts to curate and consolidate knowledge across levels of the supply chain led to the quick adoption of best practices. This formed fertile ground for innovation. Prolific innovators across the supply chain (whether large or small) were rewarded by the DTIC.

Due to the high level of trust and commitment to the greater good (i.e. the establishment of strong local markets over the long term), all role players implemented the Master Plans targets in the spirit of shared responsibility. The parties avoided unilateral action that undermined the successful implementation of the Master Plans, or the ability of other parties to deliver on their commitments.



The government prioritised collaborative governance, i.e. the governance of governance. It regularly conducted impact assessments on the way in which the market had adjusted in response to government's specific plans. Serious efforts were made to properly understand, navigate and influence the dynamics of the agri markets. Over time, the complexity of the agri market became slightly more comprehensible. Efforts to influence outcomes became slightly more feasible. Where possible, catalysts were introduced as part of remedies to ensure spontaneous self-organisation and market creation.

Leadership and governance structures were prioritised throughout, ensuring effective delivery. Those charged with oversight and implementation were appropriately skilled and adequately resourced. The impact of the Master Plans was continuously assessed, and the impact of micro-economic interventions on the macro-economy was analysed. Recommendations on course-corrections were appropriately communicated before implementation. The sound policy environment encouraged investment by both the larger and smaller firms. Jobs were created.

The successful expansion of the local supply chain

In this scenario, considerable focus was placed on the development of new upstream, downstream, and even brand-new markets. This focus was enabled by a substantial restructure of the value chain, as well as the expansion of production.

At an **upstream** level, commercial-scale contract farmers were established across prioritised sectors (including maize and soya), and supply agreements with integrated producers were entered into. Contract farmers received a fair and equitable compensation. They received fair access to inputs. Significant investments were made in local crop feed production to obtain better protection against international prices (which generally did not favour South African producers). The increase in local production also resulted in larger quantities of inputs (like seed and fertiliser) being procured at significantly lower prices. The lower input costs created new foundations for a diversified industry.

In order to establish strong **downstream** markets, trade measures had to be employed in the short term. These included tariffs, anti-dumping measures, countervailing measures, preferential trade agreements, and entry price systems. Trade structures were streamlined, import licences were implemented, and incentives like rebates were introduced to reward parties who achieved certain export volumes. Examples of the downstream markets that were developed included:

- In the **forestry** supply chain, the pole, pulp, paper, bio-refinery and board manufacturing markets were developed as a result of more afforestation. Architects were trained in the use of wood as a construction



material, and this led to the greater use of timber in the built environment. Growing the furniture market attracted significant investment and created jobs. Many opportunities in countries across Africa became more accessible under the AfCFTA.

- In the **sugar** supply chain, the focus was on growing the downstream markets for sugar-derived products, biofuels, animal feeds, and alcohol. The production of a range of chemicals, being feedstock for (i) the production of bio-based products, and (ii) materials for application in several sectors, such as plastics, packaging, automotive products, pharmaceuticals, textile, and industrial products further contributed to the development of a strong downstream market.
- In the **poultry** supply chain, downstream initiatives included the establishment of processing plants as well as the development of export markets.

The successful restructuring of industry capacity resulted in increased cost-savings and competitiveness, and a reduced reliance on tariff protection. Some of the **new (diversified) markets** that were developed included urban food production facilities, vertical food production, food technologies, and agri-processing technologies.

Opportunities at local, regional, as well as international levels were developed.

The significant expansion of upstream, downstream, and new markets led to increasing tenure of agri jobs, as seasonal workers were employed elsewhere in the increasingly expanding supply chain. Agri employment became an attractive option as it opened opportunities across technology, mathematics, engineering, social sciences, and food security fields.



Job creation is flourishing

In this scenario, job creation is flourishing because:

- Fair procurement practices strengthened the sustainability and growth of SMEs across the chain.
- Master plans were implemented successfully and timeously. This resulted in the re-establishment of local industries with more local production and investment.
- Market interventions and remedies imposed by the Competition Commission made it easier for SMEs to enter and grow.
- Sectors with potential employment multipliers were prioritised.
- Some of the job creation initiatives focused primarily on the development of rural areas, women, and youth.
- There was appropriate trade protection against low priced and dumped imports.



Skills for the Future and an Appropriate Approach

SKILLS FOR THE NEAR FUTURE

Agriculture skills for the future could be categorised as follows:

- Soft skills: collaboration/teamwork, communication, customer service, business principles, and sales.
- Systems thinking (design thinking, critical thinking, exponential thinking, process, project management, problem solving).
- Technology integration (low tech and high tech, engineering and analysis).
- Data management (storage, analysis, collection, security).
- Basic natural sciences (soil, biology, plant, animal).



Figure 14: Essential future skills



THE POTENTIAL VALUE OF A MESO-ECONOMICS APPROACH

Further to the prioritisation of systems thinking, it is proposed that the field of meso-economics constitutes a critical future skill for government and business in agriculture. Meso-economics refers to the middle ground between micro- and macro-economics, i.e., how micro-economic intervention translates into macro-economic results.

Too often, economic policy is drafted based on the successes of developed countries, and the existence of a particular correlation between certain variables of the particular countries. In other words, policy often aims to work towards a particular correlation between variables. However, such a “matching” approach disregards the long process of development (over hundreds of years) that had spontaneously led to the particular correlation. Developed countries moved across multiple planes of productivity before reaching a particular outcome. The science of thinking in sequential productivity “planes” that eventually steer economies from a low level of development to increasingly higher levels of development via micro-economic interventions constitutes meso-economics.

Awareness of meso-economics requires a deep appreciation for the value of incrementalism to effect changes to society. A focus on large jumps, as opposed to incrementalism, may often result in the manipulation of end results at the expense of process or spontaneous future growth. The latter will be essential to ensure the long-term sustainability of a system. In the current context it is therefore proposed that some of the most important skill sets, to be adopted by government and business, is a deep appreciation for meso economics.

Some areas that meso economics could address include:

- First, second and third order emergence
- The economy as an ecology of plans, not an aggregate of plans
- The importance of history and path dependence
- Pattern recognition
- The concepts of relational governance and collibratory governance



THE AGRICULTURE AND AGRO-PROCESSING MASTER PLAN

The Agriculture and Agro-Processing Master Plan (AAMP) set as its vision “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 opportunities**”.

There are obvious areas of potential synergy between the initiatives necessary to attain the *Agri for all* scenario and the AAMP strategic objectives:

- 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 digitalisation
- Create effective farmer support and agro-processing 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
- Enhance resilience to climate change and management of natural resources

Furthermore, the 6 AAMP pillars and targeted commitments could go a long way toward enabling the *Agri for all* scenario. The 6 AAMP pillars and targeted commitments are summarised in the table below.

Pillar	Targeted Commitments
<p>PILLAR 1</p> <p>Resolving policy ambiguities and creating an investment friendly climate</p>	<p>Land: Land and Agric Coord Agency; 200k ha transferred per year Water: Water licence issued in 90 days; Black farmer share to 19% Labour and conditions: Worker equity and ownership; Employment creation; Upward mobility & Rights@W; Just transitional technology Transformation: Production schemes for smallholder & subsistence farmers aligned to VC via PPP</p>
<p>PILLAR 2</p> <p>Creating enabling infrastructure</p>	<p>Water and electricity: Dams and irrigation schemes; Cogenerating in line with IRP Road and logistics: Port efficiency and capacity; Off farm infrastructure Market and biosecurity: Traceability & identification; Research and development; Project rebirth - NFPMs</p>

Pillar	Targeted Commitments
<p>PILLAR 3</p> <p>Providing comprehensive farmer support, development finance, R&D and extension services</p>	<p>Extension services: 10 000 extension officers in partnership & secondment to commodity associations Finance: Blended finance tool for farmers and SMMEs; Supplier development programmes for SMMEs</p>
<p>PILLAR 4</p> <p>Ensuring food security, expanded production and employment creation, decency, and inclusivity</p>	<p>Develop value chain: Adopt value chain approach for expanding primary and processing production via private-public partnerships</p>
<p>PILLAR 5</p> <p>Enabling markets expansion, improving market access, and trade facilitation</p>	<p>Domestic market: Increase local supermarkets & institutional procurement Regional market: Promote and implement AfCFTA – Regional VC Deep-sea markets: Create trade promotion fund aligned to Statutory Levy by Commodity Associations</p>
<p>PILLAR 6</p> <p>Developing localised food, import replacement and expanded agro-processing exports</p>	<p>Routes to markets: Alternative routes to markets Localisation: Implement the Import Substitution Strategy Retail lease: Implement Competition Commission Supermarkets recommendations</p>

Mini-Scenarios

The IFR team developed five mini scenarios that could emerge from the Agri for all scenario. These stories each focus on one issue and develop a narrative around how it could play out in a positive manner toward 2035.

HOW AQUACULTURE BECAME A SECTOR LEADER IN SOUTH AFRICAN AGRICULTURE

In 2022, the Department of Environmental Affairs and the Department of Agriculture, Forestry and Fisheries have been trying to encourage the nascent aquaculture industry for several years already. Despite this, it seemed that the industry would remain a small player in terms of overall agricultural output. Yet by 2035, the sector had transformed into one of the country's biggest success stories. How did this happen?

In the early 2020s, it seemed clear that a lack of infrastructure and value chain development was holding back the nascent aquaculture industry from growing further. Key players in the industry believed that its potential to grow further, could only be unlocked if a more strategic approach was adopted, with a targeted effort to address the barriers holding back development, and reaching the economies of scale required to sustain more players in the industry value chain, and even to start being a supplier of agri-tech to some of our neighbouring countries. An Imbizo was called, which included key Government departments and representatives of various business sectors. They identified the key areas holding back growth and development. One of the leverage points which was identified for immediate attention, was the high input costs associated with fish feed.

Following the session, a targeted investment programme was launched. This initiative included loans earmarked for specific purposes, with development favouring rural areas where job creation was vital. The enterprises still had to be profitable however, so careful a careful and transparent bidding process was entered into. The Government had announced a zero-tolerance approach to any form of corruption, and independent auditors were employed to verify the process.

Five years on from 2022, the country has resolved the fish feed issue. Moreover, the country has created a vibrant local industry that supplies the local aquaculture industry, creates jobs in rural areas, and which has even started exporting fish feed to fish farmers in neighbouring countries.



Of course, challenges remain for local aquaculture, but resolving at least one of the factors holding the growth of the industry back, has seen it taking great leaps forward, and now, in 2035 it is a vibrant and exciting part of the agri-mix in South Africa.

URBAN FARMERS TAKING THE LEAD

Here in 2035, urban farmers had assumed new prominence as part of the agricultural sector. Following on the Covid-19 pandemic, work-from-anywhere arrangements had started to proliferate. Although many had thought that employees would return en masse to their former offices after the pandemic ended, this was not the case. Employees had become accustomed to greater flexibility, while employers soon realized they could access wider skillsets available in divergent locations if they dispensed with the requirement to have employees in the office every day. As a result, many employers decided to scale down urban operations. Cities remained vibrant hubs attracting talent (historically, cities have always benefited from a concentration of resources and people that drive innovation), but they changed in nature, with a focus on more shared, green spaces (and more equitable access to these spaces) and opportunities for outside social engagements. Major cities competed to establish a 15-minute city infrastructure – the concept that everything should be within easy walking distance.

A focus on urban farming grew naturally from this shifting use of urban spaces, at a time when the effects of climate change was already intensifying. Suddenly, more suitable properties became available at more affordable rates – making the urban farming sector viable where it wasn't before. Urban farming initiatives were designed to be smart. It required digital infrastructure support and technological know-how. Government immediately saw the potential appeal of smart farming as an employer, but there were several barriers to overcome.

Firstly, a detailed scoping of the requirements of urban and, in particular, vertical farming was undertaken, in consultation with key representatives from the sector. The output of this scoping was used to establish specific, focused training programmes. Opportunities ranged from entry level roles, such as “hydrology technician”, to aspirational roles like “micro-climate engineer”.



Secondly, the nascent sector required nurturing if it was to reach its full potential. When the backward and forward linkages were carefully analysed, it became clear that much of the initial input material and technology were imported. This made the sector vulnerable to exchange rate fluctuations as well as potential supply chain disruptions. A focused programme was launched as a partnership between key government agencies and industry bodies, identifying crucial gaps that needed to be filled. The result was that South Africa became self-sufficient in its production in vertical farming components by 2025, and even began exporting these components to several African countries.

When yet another extreme drought hit South Africa in 2026, vertical farms in urban settings enjoyed unparalleled advantages as they were less dependent on the natural climate and were also extremely frugal in terms of water consumption. While not all commodities can be produced in urban centres, as traditional agricultural started to falter, urban farmers managed to step in to fill the void left by many traditional farmers. This reduced the need to import produce during the drought and helping to ensure continued food security for the nation during a difficult time. Moreover, a reduced reliance on the physical environment offered another unexpected advantage: stable employment during difficult times.

LAND PHILOSOPHY – HOW EFFICIENT USAGE FINALLY TRUMPED THE POLITICAL AGENDA

By 2025 it had become clear that Government's land reform plans had failed. After years of vacillation, Government had implemented a blanket land expropriation and reform strategy. And for about two years it seemed that the big gamble had paid off. Despite foreign investors fleeing in droves and agricultural loans grinding to a halt, agricultural production seemed to continue at an acceptable level for some time. However, the cracks soon became visible. New farmers lacked the knowledge to operate expensive equipment, and the training provided by the state provided wholly inadequate. When series of successive natural disasters hit, these new farmers lacked the know-how to counteract its impact. First, there were a series of localised tornados in the north-East of the Eastern Cape and parts of Kwa-Zulu Natal. At the same time, the country endured a typical drought lasting about two years. As a result, veld fires became more common, laying vast tracts of land to waste. These were finally followed by floods and hailstorms once the droughts ended. While none of these events would have proven disastrous in isolation, following as they did closely upon each other, they depleted any reserves the farmers may have built up over time. As resources had started drying up during the drought period, farmers had also dispensed with insurance as a means to save costs – a strategy that ultimately proved to be their downfall. Five years post the great land restitution exercise, it was clear that the strategy had failed. South Africa was a net importer of agricultural produce, with further pressure from a volatile exchange rate.

With vast tracts of land now on sale, few willing buyers, and the spectre of growing social unrest, Government finally admitted that a new strategy was called for, one that set aside the political agenda in favour of the greater good. The strategy was based on a bidding system, together with financial support and structured



lending programme that not only considered capital, but also expertise, willingness to learn and commitment to the sustainable management of the land. Government legislated non-interference with agricultural land allocations for a period of 50 years from the launch date of the programme, offering certainty to buyers that helped to restore some confidence in property rights.

Care was also exercised to balance allocations to commercial farming with the interests of smaller scale farmers. It was decided to take the impact of climate change into consideration from the outset, given the hard lessons the country had learned following on extreme weather conditions. It was recognised that land would have to be put to productive agricultural use to form part of the programme, for activities which are dependent on the land, and which cannot be successfully conducted indoors. Furthermore, a climate mitigation plan became a prerequisite for land being awarded – it was recognised that if climate change is not managed from the outset, any farmer would at best only have temporary success – until the next extreme weather event hit. By 2035 the agricultural industry looked completely different, having been transformed twice within a short space of time.

HOW AGRI BECAME COOL

Thinking back to his teenage years in the late-2010s, Jonathan Ramontsha could not help but consider how unlikely his career choice would have seemed then. Now the manager of a successful vertical farming business, incorporating three different sites, Jonathan never intended becoming a farmer. When he finished school, farming seemed like the least attractive option to pursue, with the only viable choice being backbreaking small-holder farming and certain poverty. Jonathan pursued business studies for three years after finishing school, just as the Farming Entrepreneurship Programme was introduced. The programme had been developed by the agri industry in consultation with government, the business sector and key educational institutions in the early 2020s.

To be honest, Jonathan would not have given farming a second thought, had it not been for the word “entrepreneurship” in the title. The programme was based on a strict application process, and considered three elements. First, an eighteen-month farming basics programme, offering a further specialisation in one of five choices (field crops, livestock, urban farming, aquaculture or fruit farming) which added another six months to the programme. Those who exited after eighteen months with a diploma, could work as farm managers, but equally often were absorbed into other areas of the agricultural value chain. What appealed to Jonathan, however, is that those who completed the two-year course in full, were given preference for start-up funding and support from government and NGOs to set up their own farming operations. Being his own boss appealed to his business sensibilities, while he also always had a passion for technology. Knowing that there was access to capital as part of the programme, was a great motivator for many candidates whether they came from poor backgrounds or simply had big growth aspirations. Importantly, funding was not primarily linked to poverty reduction goals, but rather the ability to contribute to economic growth.



Jonathan opted for the urban farming module, applied for funding, and formed part of the government/industry combined mentorship programme that lasted a further two years. The programme included gaining access to a complete “urban farm in a box” module, plus access to mentorship in market development, bidding and market strategy, as well as technology transfer. After five years operating his own urban farm, and with most of his first loan paid off, Jonathan was ready to expand into his second farm. The challenges to managing two farms, and staff complements in diverse locations, were tough. Luckily, there was also a training programme that was aimed at helping established farmers who want to expand their operations in gaining the necessary experience about managing multi-venue operations. Now, Jonathan considers himself as an entrepreneur first, an employer second, and finally a farmer.

The Department of Agriculture, in consultation with industry, has just announced it had secured additional funding from several international donors following on the spectacular successes the programme has achieved to date. It will be expanding further from next year – offering training to small and mid-scale farmers who are eyeing the export market. Jonathan has already put his name forward, certain that he can also make a success of entering the export market.



FILLING THE MISSING MIDDLE

By 2023, Government was forced to recognise it had a problem in the agri-industry. On the one hand, consolidation had driven the rise of high-tech, mega-farming operations. On the other hand, land restitution programmes had seen a proliferation of small, largely subsistence type farmers. Unfortunately, the subsistence farmers had remained trapped in a cycle of poverty. Lacking the know-how to offset climate change, access technologies or gain effective access to market structures, these farms remained small and inefficient operations. As a result, although the structure of the South African agricultural industry looked significantly different to the past, it remained plagued by issues, continuing to shrink relative to other sectors of the economy and not creating additional employment opportunities.

After a series of consultations with the local agriculture industry, it became clear that the problem was multi-faceted and required a multi-pronged approach. It was not solely an issue of education, local know-how, technological experience, business acumen or access to capital. Rather, it was combination of these that were preventing small scale farmers from growing. Government, industry representatives and mega-farmers met and collaborated in developing a strategy to help small scale farmers to become more competitive. Following this, small and subsistence co-ops were established where farmers shared knowledge, expertise and insights locally. Targeted educational interventions were also hosted at this level. Government subsidised basic technology interventions at the co-op level. As a result, farmers on these levels could gain access to technology on a pooled basis, together with training and oversight where needed. Climate mitigation strategies and initiatives also qualified for government subsidies. Soon, the resilience of small-scale farmers was starting to improve, but market access remained a challenge.

Again, technology provided an option – local suppliers could bid collectively. Local restaurants were keen to offer sustainably farmed, local produce to their patrons, opening a niche for small farmers which was not previously accessible. With steady incomes secured, finding loans for expansion became possible for some entrants, who also benefited from targeted government interventions. Slowly, some of the small-scale farmers began to evolve into medium-sized farming enterprises, who could employ more workers under better conditions.

Today, in 2035, the structure of the South African agricultural industry looks appreciably different to what it did in the early 2020s.



Concluding Thoughts

The future of job creation in the South African agricultural sector is a complex one. The issue is not only clouded by the country's political history, but also by the real and pressing need to transform the sector. However, so far, only limited success has been achieved. Despite the goals outlined in the NDP nearly nine years ago, agricultural employment has not displayed the desired upward trend. The reliance on subsistence and small-scale agriculture may be understandable from a labour intensity perspective, but such jobs may firstly not appeal to the youth, and may secondly not be sustainable considering issues of land degradation and vulnerability to climate change often associated with small scale agriculture. Furthermore, even where such jobs are created, it may not fit into the ILO's definition of decent work.

While technology is depressing the number of on-farm jobs being created in agriculture, it is creating new opportunities that are also not as closely tied to the use of agricultural land (or as climate dependent). Both of these aspects may enable easier (and faster) gains than has been the case to date in land-based agricultural reform, provided a coherent and strategic approach can be adopted to develop the opportunities.

Agricultural expansion in South Africa has often been limited by weak inter-economic linkages. Reviewing the country's agricultural linkages and infrastructure, identifying gaps that is limiting expansion and targeting specific initiatives to address these, may be low-hanging fruit that can unlock many more jobs that require somewhat more skilled employees (and which is also more likely to appeal to the unemployed youth).

Job creation will need to be supported by educational initiatives to address the skills shortage and to ensure the necessary support structures and capabilities are in place. Ensuring all these capabilities are suitably integrated will be key to building a sustainable agricultural sector that can deliver on the job creation needs of South Africa's growing population. By broadening agricultural strategies and plans to include new areas and ventures, the country could also enhance the resilience of its agricultural sector and further diversify its approach to ensuring food security.



Glossary of Terms and Abbreviations

AAMP	Agricultural and Agro-Processing Master Plan
AfCFTA	Africa Continental Free Trade Area agreement
Agri	the entire supply chain associated with the agricultural sector, including inputs, production, processing, distribution, wholesale and retail
Buyer Power Guidelines	Buyer Power Enforcement Guidelines issued by the Competition Commission of South Africa (12 May 2020)
Buyer Power Regulations	Regulations of Buyer Power made by the Minister of the Department of Trade and Industry under the Competition Act, 1998 (13 February 2020)
Collibratory governance	The governance of governance, a concept popularised by Bob Jessop
Competition Act	Competition Act No. 89 of 1998
Competition Commission	Competition Commission of South Africa
DTIC	Department of Trade, Industry and Competition
Forestry Impact Study	The impact of Vertical Integration on Competition and the Participation of SMEs and HDPs in the Forestry Sector
HDP firms	Firms owned or controlled by historically disadvantaged people
IDC	Industrial Development Corporation
PAJA	Promotion of Administrative Justice Act, 2000
SMEs	Small and medium enterprises
SOEs	State-owned enterprises



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“ The only
thing we know
about the future,
is that it will be
different.

- Peter Ducker