BFAP BASELINE

Agricultural Outlook 2016 - 2025

Bureau for Food and Agricultural Policy
BFAP

August 2016

PUTTING PLANS INTO ACTION: AGRICULTURE AND ECONOMIC GROWTH IN SOUTH AFRICA








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South African Feedlot Association (SAFA)
South African Grain Information Service (SAGIS)
South African Milk Processors Association (SAMPRO)
South African Poultry Association (SAPA)
South African Pork Producers Organisation (SAPPO)
South African Wine Industry Information & Systems (SAWIS)
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FOREWORD

THE BUREAU FOR FOOD AND AGRICULTURAL POLICY (BFAP) was founded in 2004 with the purpose to inform decision-making by stakeholders in the agro-food, fibre and beverage complex by providing independent research-based policy and market analyses. BFAP has offices at the University of Pretoria, the University of Stellenbosch, and the Western Cape Department of Agriculture and consists of 42 public and private sector analysts and experts who pool their knowledge and research to inform decision-making within South Africa's food and beverage sector. BFAP has become a valuable resource to the agro-industrial complex by providing analyses of future policy and market scenarios and measuring the simulated impact on farm and firm profitability. BFAP collaborates with various international institutions and is a founding partner in the Regional Network of Agricultural Policy Research Institutes (ReNAPRI) in Eastern and Southern Africa. The Bureau consults to both national and multinational private sector entities as well as to government on national and provincial level.

BFAP acknowledges and appreciates the tremendous insight of numerous industry specialists and collaborators over the past years. Although all industry partners' comments and suggestions are taken into consideration, BFAP's own views are presented in this Baseline publication.

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CONTEXT AND PURPOSE OF THE BASELINE

THE 2016 EDITION OF THE BFAP Baseline presents an outlook of agricultural production, consumption, prices and trade in South Africa for the period 2016 to 2025 and relates these to potential actions aimed at increasing the agricultural sector's contribution to economic growth. The information presented is based on assumptions about a range of economic, technological, environmental, political, institutional, and social factors. The outlook is generated by the BFAP sector model, an econometric, recursive, partial equilibrium model of the South African agricultural sector. For each commodity, important components of supply and demand are identified and equilibrium established in each market through balance sheet principles where demand equals supply. A number of critical assumptions have to be made for baseline projections. One of the most important is that stable weather conditions will prevail in Southern Africa and around the world: therefore yields grow constantly over the baseline as technology improves. Assumptions regarding the outlook of macroeconomic conditions are based on a combination of projections developed by the International Monetary Fund (IMF), the World Bank and the Bureau for Economic Research (BER) at Stellenbosch University. Baseline projections for world commodity markets were generated by FAPRI at the University of Missouri. Once the critical assumptions are captured in the BFAP sector model, the Outlook for all commodities is simulated within a closed system of equations. This implies that, for example, any shocks in the grain sector are transmitted to the livestock sector and vice versa.

This year's baseline takes the latest trends, policies and market information into consideration and is constructed in such a way that the decision maker can form a picture of equilibrium in agricultural markets given the assumptions made. However, markets are extremely volatile and the probability that future prices will not match baseline projections is therefore high. Given this uncertainty, the baseline projections should be interpreted as one possible scenario that could unfold, where temporary factors (e.g. weather issues) play out over the short run and permanent factors (e.g. biofuels policies) cause structural shifts in agricultural commodity markets over the long run. The baseline, therefore, serves as a benchmark against which alternative exogenous shocks can be measured and understood. In addition, the baseline serves as an early-warning system to inform role-players in the agricultural industry about the potential effects of long-term structural changes on agricultural commodity markets, such as the impact of a sharp increase in input prices or the impact of improvements in technology on the supply response.

To summarise, the baseline does NOT constitute a forecast, but rather represents a benchmark of what COULD happen under a particular set of assumptions. Inherent uncertainties, including policy changes, weather, and other market variations ensure that the future is highly unlikely to match baseline projections. Recognising this fact, BFAP incorporates scenario planning and risk analyses in the process of attempting to understand the underlying risks and uncertainties of agricultural markets. Some of the boxes in the publication present results of a number of specific or commissioned analyses through the past 18 months. Farm-level implications are included in the commodity specific sections and the scenarios and risk analyses illustrate the volatile outcome of future projections. Further stochastic (risk) analyses are not published in the baseline, but prepared independently on request for clients. The BFAP Baseline 2016 should thus be regarded as only one of the tools in the decision-making process of the agricultural sector, and other sources of information, experience, and planning and decision making techniques have to be taken into consideration.

EXECUTIVE SUMMARY AND IMPLICATIONS

SOUTH AFRICAN AGRICULTURE HAS performed well over the past decade; despite some volatility owing to its dependence on global markets and on an inclement climate, gross value added by the sector expanded by more than 15% in real terms since 2005. However, this expansion peaked at over 30% in 2014, before declining rapidly in the past two seasons as a result of extreme drought in the summer rainfall regions. The severity of the current drought has re-emphasized the importance of a vibrant and sustainable agricultural sector, yet contrary to the past decade, where performance was supported by factors such as the commodity super cycle, progress in the coming decade will have to be achieved in an environment of weaker economic growth and lower commodity prices, mainly through increased productivity. While 2016 in particular will be remembered as a challenging year, the sector's resilience and ability to recover from a shock such as the current drought is underpinned by a combination of key underlying fundamentals linked to the long-term competitiveness of the industry.

Globally, agricultural commodity prices have fallen well below the peaks of 2013, as generally high production levels have replenished stocks. Furthermore, the two demand drivers of the past decade, namely biofuel production and rapid growth of the Chinese economy, are expected to slow significantly over the next ten years. Biofuel production is expected to be largely mandate driven due to weaker crude oil prices, whilst the Chinese economy is expected to grow at a slower rate due to domestic credit limitations. Therefore, barring extreme weather conditions and related supply shocks, crop prices are expected to remain under pressure in the short term, before starting a gradual recovery towards 2020 on the back of area consolidation and rising demand for animal feed. Supported by an inherently higher cost structure, this consolidation in price levels remains above pre-2007 levels. Whilst initially lagging behind crop prices due to the longer production cycle, meat prices have also declined from 2014 peaks on the back of weaker demand and a lower cost structure resulting from reduced feed grain prices. In line with the crop sector, prices are expected to stabilise well below recent peaks over the next decade.

In South Africa, much of the decline in world prices has been negated by the sharp depreciation in the value of the Rand, which by May 2016 had declined by almost 48% over the preceding 24 month period. Combined with the impact of the domestic drought, which pushed summer grain prices (that may have traded closer to export parity in a normal year) to import parity levels, these exchange rate dynamics pushed South African agricultural commodity prices to record levels in 2016, despite low world prices. In the case of maize, the domestic crop is expected to decline by almost 30% from an already below average 2015 harvest and consequently imports are expected to exceed 3 million tons in the 2016/17 marketing year. Under the assumption of stable weather conditions, South Africa is projected to return to a net exporting position from 2017 onwards, though the projected surplus is unlikely to be sufficient to maintain prices at export parity levels throughout a normal year. Following the correction in 2017, the area under white maize in particular is projected to return to a long term declining trend, as producers shift towards yellow maize and particularly oilseeds. Owing to its resilience under drought conditions and extended planting window, sunflower was the only summer crop for which area did not decline as a result of the drought, but in the long run sunflower area is projected to consolidate at around 550 thousand hectares, whilst soya beans are projected to expand by an annual average of almost 5%, to almost a million hectares by 2025. Despite rapidly increasing production, however, South Africa is projected to remain a net importer, as processors strive to reduce fixed costs through increased utilisation of newly expanded crushing capacity.

A similar shift from grains to oilseed is projected in the winter rainfall regions, where the area under canola is expected to expand by an annual average of 6%, due to the prospect of better adapted, high yielding varieties, as well as its proven benefits as part of a rotational cropping system. Typically trading at import parity levels, winter grain prices were less affected by the current drought, but prices remain well supported by the combination of the variable import tariff on wheat, which currently exceeds R1000 per ton, and the weaker currency. In response, the total area in the winter rainfall regions is projected to expand in 2017, before consolidating over the medium term. Barley has been competitive in the Southern Cape in the recent past and in light of a favourable yield growth outlook arising from the introduction of new varieties, gross margins are expected to support expansion of barley area at the expense of wheat over the coming decade, provided that the current pricing structure that links barley prices to wheat prices is maintained. While projected yield growth is sufficient to offset declining wheat area, consumption growth over the outlook implies that by 2025, imports are projected to reach 2.4 million tons.

Having expanded rapidly over the past decade, consumption growth of meat and dairy products is projected to slow over the next ten years, largely as a result of a more cautious outlook on income growth. The past decade has seen significant class mobility, but the rate of movement into higher LSM groups has slowed in recent years. Combined with continued urbanisation, it has been a key driver of rising meat consumption and the expected slowdown, particularly in the short term, will also be most evident in meat and dairy consumption. At the same time, the livestock sector has not escaped the impact of the current drought. Within the feed intensive livestock sectors, which typically also compete with competitively priced imported products, profitability is under pressure as a result of high feed costs, whilst rapid deterioration in grazing conditions has been problematic in extensive livestock sectors. A recent survey conducted for the Red Meat Producer's Organisation by the University of the Free State points to a decline of approximately 15% in the commercial cow herd from 2013 levels. However beef prices did not decline as a result of increased slaughters, finding support from firm export demand, particularly from the Middle East, during a period of high international beef prices. This rapid growth in export demand is expected to slow somewhat as global beef prices decline, but assuming that South Africa remains free of Foot and Mouth

disease, export volumes remain sufficient to support price levels during a period of weaker domestic demand. Consequently a phase of herd rebuilding in response to improved weather conditions would induce a sharp and prolonged increase in domestic beef prices in the coming years. Affordability being an important consideration for cash strapped consumers, poultry products are projected to account for the bulk of meat consumption growth, though the rate of expansion is expected to slow significantly from the past decade. Imported products continue to supplement domestic production in the poultry sector, and over the course of the next decade the share of imports in domestic consumption is expected to increase as the rate of production growth remains well below that of consumption growth. Bone-in portions imported duty free from the European Union continue to account for the bulk of imported products.

Within the horticultural sector, production tends to be export orientated and competitiveness in the global context has become paramount. Continued currency devaluation has supported the competitiveness of South African products in the global market, but also increased the cost of production. Similar exchange rate devaluation amongst South Africa's main competitors has also negated this impact to some extent and hence quality, consistency and continuity remain of utmost importance to ensure competitiveness. High summer temperatures also impacted negatively on the quality attributes of many fruit types in 2016. Over the course of the next decade apple and pear exports are projected to expand by 11% (413 thousand tons) and 22% (230 thousand tons) respectively. Continued exploration of improved market access and negotiation of a more favourable tariff structure will be critical going forward.

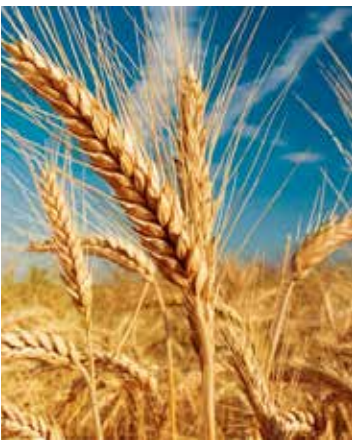
Significant exchange rate depreciation has been a key factor supporting price levels for producers during a period when output was sharply reduced. However from a consumer's perspective, it has also been a key driver of food inflation. It increases the cost of imported products, allows for attractive export opportunities such as those evident in the red meat sector, and also supports increases in the cost of manufacturing and distribution of food products. Rising food inflation has broad implications affecting aspects of the macro-economy and households, specifically lower income households (LSM 1-3), which spend up to 35% of their income on food. From April 2014 to April 2015, the inflation measured by the BFAP balanced food baskets (+23.8% for the thrifty basket and +25.8% for the more diverse basket) were significantly higher than CPI for food and non-alcoholic beverages (+12.3%) and the general CPI inflation (+6.5%). In light of minimal income growth, poor households are most likely facing a reality of consuming less food and given overall high food inflation, even less dietary diversity.

Based on historical dynamics an acceleration of food inflation can be expected in South Africa, reaching a peak of 13.7% in October 2016, before decreasing steadily to a rate of around 8.8% by September 2017. This implies an estimated average inflation of 10.75% for the first three quarters of 2017. Maize meal and rice are the most affordable staple options when serving size is taken into account. In light of maize price movements, the cost of a serving of maize meal increased by 43.7% to R0.49 from April 2015 to April 2016, while the cost of a serving of white bread increased by only 9% over the same period. Keeping in mind that bread is ready-to-eat, it is becoming an increasingly attractive staple option for consumers, as total human consumption of maize is only about 40% more than total consumption of wheat. Going forward however, the projected decline of more than 35% in maize prices resulting from normalised weather conditions in 2017 is expected to induce a 22% decline in the cost of a maize meal serving towards 2017. These projected price movements highlight that a return to surplus production, particularly within key food security sectors, represents an efficient way of combating food price inflation going forward. Thus the long term sustainability of such sectors must be prioritised in future policy actions.

Agriculture has been identified as a sector to expand in the National Development Plan (NDP), with intensive, export orientated industries in particular identified as critical to creating jobs within the rural economy. Despite significant expansion over the past decade, consideration of the goals expressed for the agricultural sector in the NDP, as well as the plethora of commitments, plans, discussions and efforts to unlock growth and promote transformation, the sector does not seem to have grown to its full potential over the past five years. Many of the constraints that have hampered growth can be turned around through an efficient and effective bureaucracy and clear and direct leadership. Small things, which require no further requests to Treasury, but merely a realignment of resources in government, have the potential to bring large returns by unlocking potential growth. Positive agricultural growth is a prerequisite for successful transformation of the sector and positive growth can only occur through continued public and private sector investments. There are enough entrepreneurs – black and white – who will jump at greater policy certainty, improved incentives, security of tenure and stability in the sector.

Ultimately even if resources are available, it is not clear whether farmers will invest in long-term (capital and labour-intensive) enterprises in a climate where property rights are uncertain. To this end, a renewed focus is needed on creating conducive environments for farming in South Africa that reflect the diversity of natural resources, of farmers, and of historical legacy if dualism is to be successfully eradicated. An enabling environment is needed where investment can flourish, which in turn requires removal of bureaucratic constraints, whilst setting up processes and incentives that allow experimentation with different approaches and cross fertilisation of ideas across jurisdictions.

South Africa has entered a critical phase where tough choices will have to be made and implemented by strong and inclusive leadership. Nonetheless, the message is simple: provide enabling conditions (a better functioning state without red tape and ineffective processes), implement a range of models for land transfer to beneficiaries, ensure effective support to beneficiaries and eliminate political patronage for the land reform and agricultural programmes. Then we will see a thriving and growing agricultural sector, which should provide fertile ground for new farmers to put down roots. Effective coordination between DRDLR and DAFF, as well as the provincial departments will be required to be successful. At the same time locally designed and private sector initiatives should be promoted so that a sustainable, competitive, growing and transformed agricultural sector can emerge.



OVERVIEW

LESSONS FROM THE BASELINE FOR AGRICULTURE AND ECONOMIC GROWTH IN SOUTH AFRICA

Due to its volatile nature and climate dependance, it is not uncommon for the agricultural sector to have periods of negative growth and over the past decade these negative periods were always followed by periods of positive growth. However, the resilience and the ability of the sector to recover from an exogenous shock like a drought are determined by a combination of key underlying fundamentals that are linked to the long-term competitiveness of the industry.

Overall performance of sector

Over the past decade the gross value added to the South African economy by the agricultural sector has increased by 15% in real terms. Overall growth was influenced by a combination of global and macro-economic forces as well as the climate. A period of rapid growth, due to the commodity super cycle in 2008, was followed by a period of negative growth induced by the global recession. Following the recession, growth in the sector recovered and peaked in 2014 at more than 30% before the drought started having an impact from 2015 onwards (Figure 1).

Due to its volatile nature and climate dependance, it is not uncommon for the agricultural sector to have periods of negative growth and over the past decade these negative periods were always followed by periods of positive growth (Figure 1). However, the resilience and the ability of the sector to recover from an exogenous shock like a drought are determined by a combination of key underlying fundamentals that are linked to the long-term competitiveness of the industry. In the National Development Plan (NDP) matrix of 2011, BFAP identified a combination of commodities that have significant potential for growth until 2030. Figure 2 provides an overview of the actual growth rates that have been achieved by these sectors over the past five years since the launch of the NDP. Although the canola, citrus and soya bean industries have performed well, most of the larger industries have grown by around 2% per annum over the past five years. It is also worth noting that dryland crop production, especially white and yellow maize, has been affected negatively by the drought conditions that already started in the western parts of the summer rainfall areas in 2015. The strong growth rate in the beef industry over the past five years has to be interpreted with caution, since the national cow herd has been reduced by as much as 15% due to the drought, which has increased slaughtering and therefore production will be negatively affected over the next three to four years. It is encouraging to find that most of the high-value and labour intensive industries where crops are produced under irrigation have grown over the past five years, but overall growth in these industries has also been at 1% to 2% per annum.

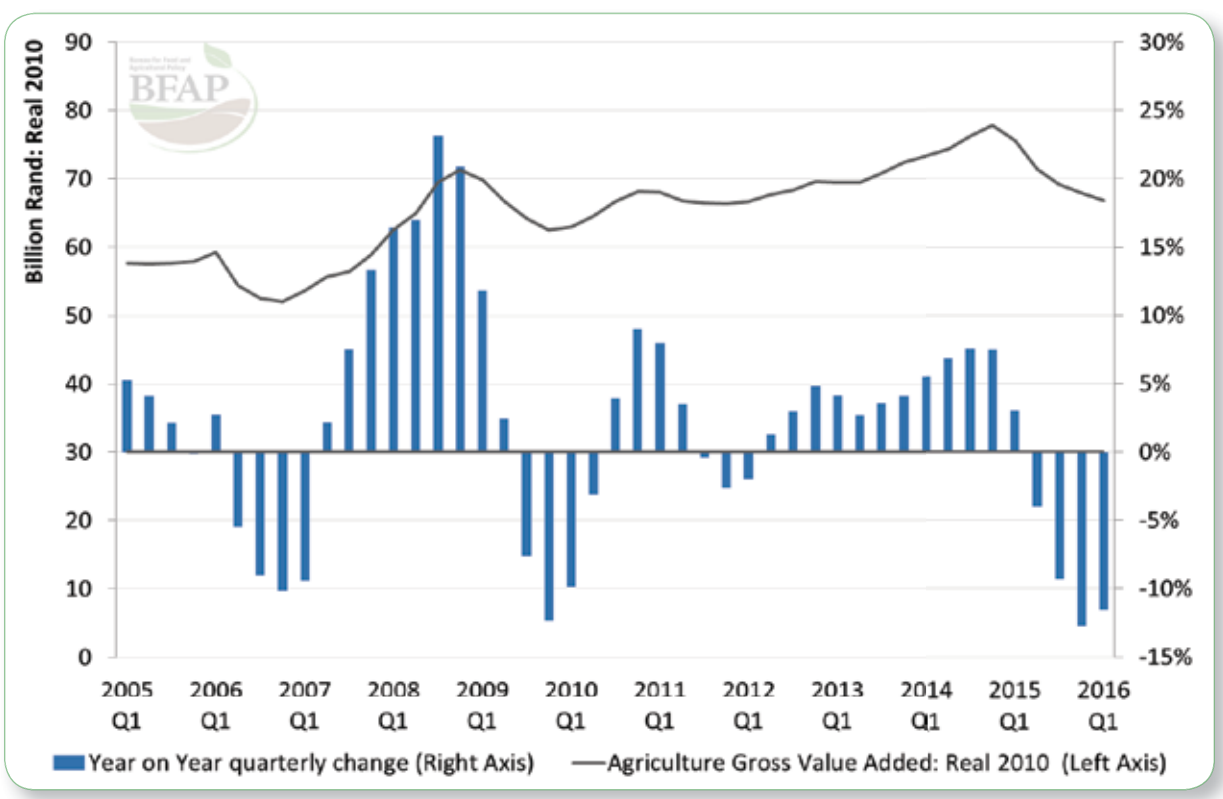


Figure 1: *Agriculture, Forestry and Fisheries GDP, 2005 - 2016*
Source: Statistics SA, 2016

The assessment of growth naturally also involves the questions related to jobs in the sector. The creation of one million jobs by 2030 was set as the target under the NDP. Figure 3 portrays the quarterly trend in employment in the agricultural sector since 2008. The results should be interpreted within the context of the change in the survey sample in the first quarter of 2015. Taking moving averages as an indication, it is relatively safe to conclude that from the launch of the NDP in 2011 until the beginning of 2013 employment rose by 110 000 jobs. Following the steep increase in the minimum wage in 2013, total agricultural employment declined by an estimated 60 000 workers to the end of 2014. Hence, employment in the agricultural industry rose by approximately 50 000 jobs since the launch of the NDP.

Then came the step change due to the new sample and from there onwards, it seems as if the sector has neither created new jobs, nor has it started shedding jobs again. Taking a look at the provincial decomposition, it is clear that most employment growth occurred in the Western Cape and Limpopo provinces where the bulk of the labour intensive crops are produced under irrigation. This comes despite the fact that these areas experienced a drop in production of approximately 15% in 2015 due to the effect of high temperatures on plant development and the drought conditions, as irrigation could not keep up with the water requirements of the orchards.

Figure 4 shows the number of households in South Africa who are involved in crop farming on less than 20 hectares, who are located in the former homeland areas and where the household head is a black person. It shows that the total number of households engaged in these activities increased from 1.6 million to 1.9 million between 2010 and 2015. This increase translates to an additional 75 000 hectares added during this period, most of which falls within the bottom tier who use less than half a hectare (Stats SA, 2015). From Figure 5, the NDP target for this category (crop farming on less than 20 hectares) is 323 000 jobs out of the total target of 1 million jobs by 2030.

The focus of the NDP is on job creation through a combination of expansion and intensification activities. Figure 5 illustrates the relative contributions of various target groups and industries to the NDP's potential of one million jobs by 2030. It is clear that the focus is on:

- the expansion of irrigation in areas where water is available and competition from residential and industrial uses is less of an issue;
- agricultural production in the former homeland areas, mostly in the Eastern Cape,
- failed land-reform projects,

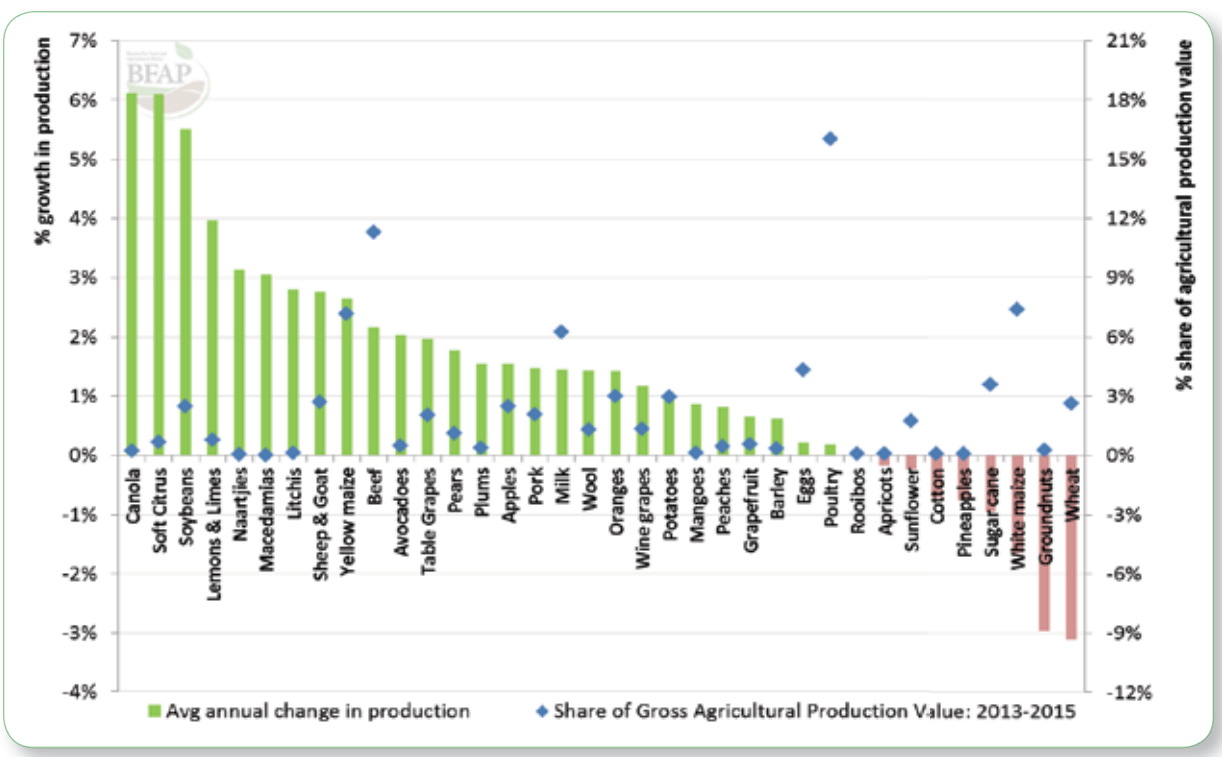


Figure 2: *Agricultural performance: growth in production and share of agricultural production value of selected industries: 2011-2015*

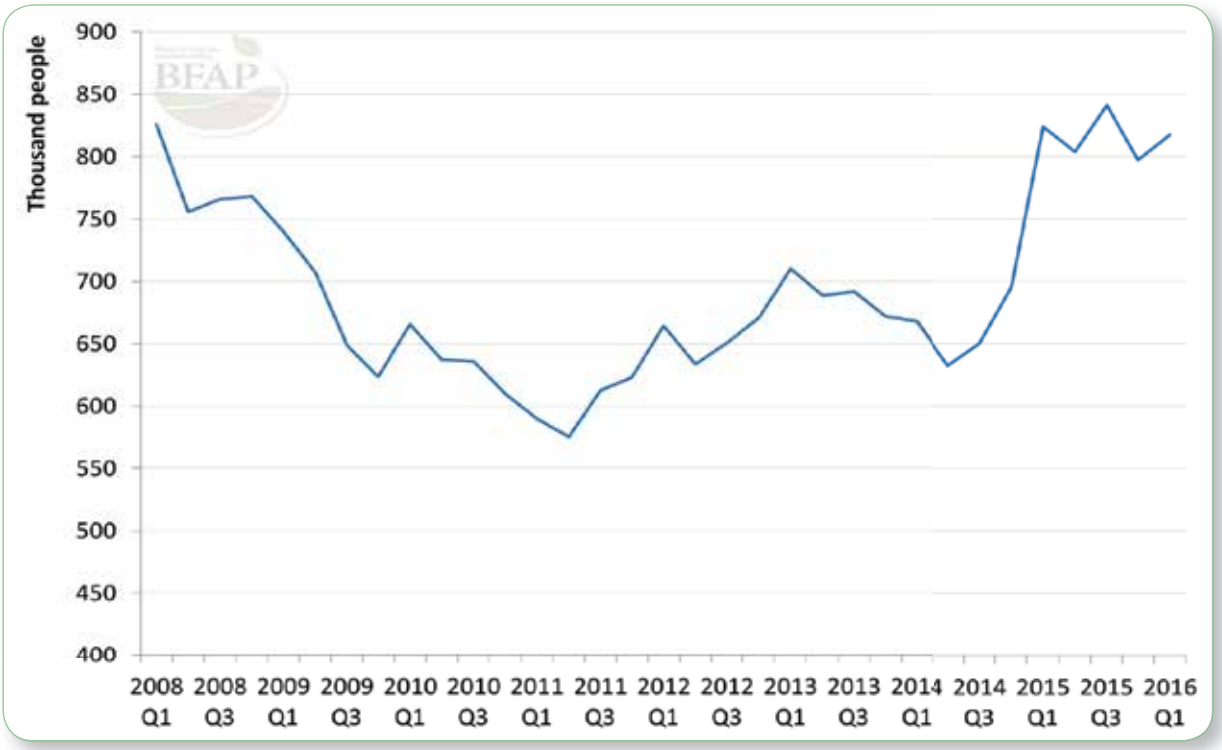


Figure 3: *Agricultural Employment according to the Quarterly Labour Force Surveys: 2008-2016*
Source: Statistics SA, 2016

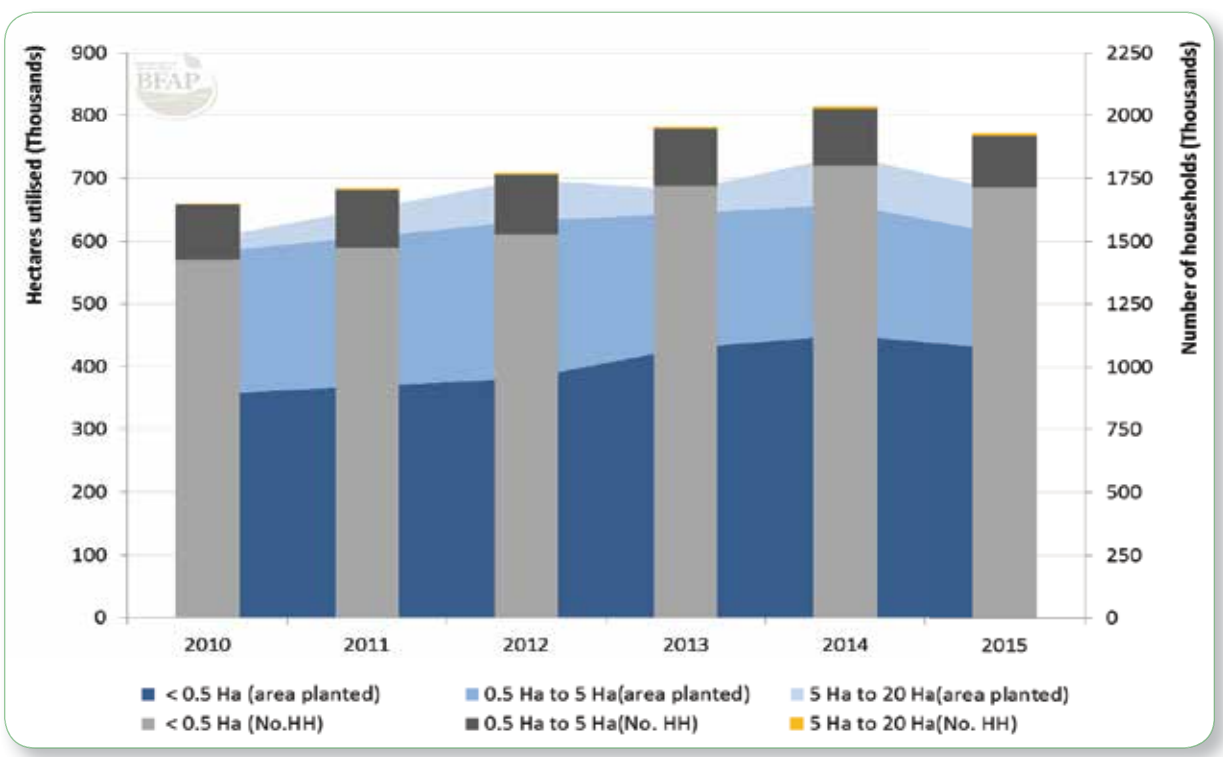


Figure 4: *Black agriculturally active households in South Africa's former homelands, 2010-2015*
Source: Stats SA, 2010 – 2015

- land reform in areas where commercial farmers can partner with new land reform beneficiaries throughout the commercial farming areas, and
- secondary jobs created by the competitive value chains

Apart from these focus areas it is also critical to note that there is a strong link between the secondary jobs created by the forward and backward linkages within competitive value chains and the other major crop and livestock industries that are less labour intensive but just as important from a strategic point of view. Therefore, despite the focus on labour-intensive industries in the NDP, the importance of the major grain and oilseed industries that can be regarded as the pillar crops for food security and stability for the rest of the industry to flourish cannot be overlooked.

To conclude, despite the clear goals expressed for the agricultural sector in the National Development Plan and the plethora of commitments, plans, discussions and efforts to unlock the growth potential of the sector and to promote transformation concurrently, the sector seems not to have reached the growth that was possible over the past five years. In short the following main issues hamper the agricultural and food sector:

- Slow or declining productivity growth for a number of industries
- Slow growth in the export markets mainly due to red tape and slow bureaucratic processes for permits and removing sanitary and phyto-sanitary trade barriers
- Poor competitiveness of major agricultural sectors
- Ineffective and duplicating service provision by the many layers of government departments.
- Constraining legislation and policies from other ministries such as dti, Labour, Water, and Rural Development and Land Reform
- Policy uncertainty and slow progress with land reform
- Low levels of new investment in fixed improvements, land improvements and expansion of farming operations due to political ambiguity and uncertainty about private property rights, especially with respect to land and water.

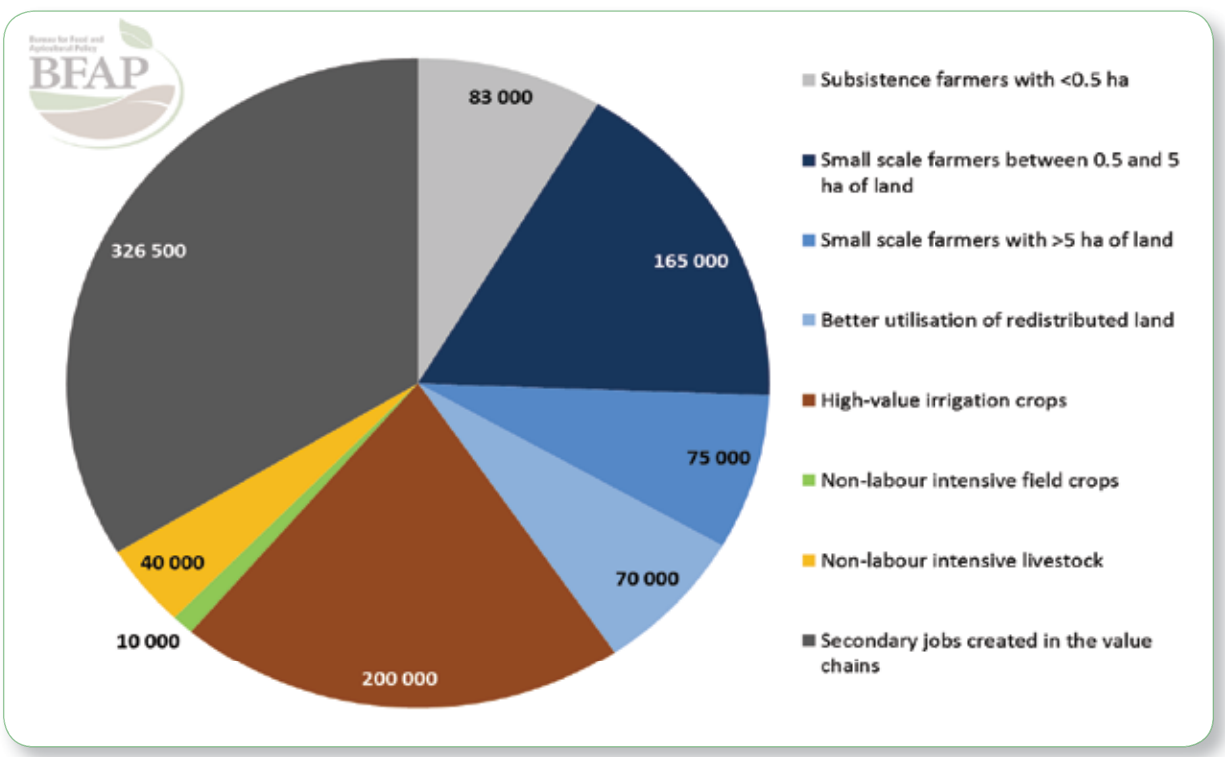


Figure 5: *NDP relative contributions by target groups to one million jobs by 2030.*
Source: National Development Plan, 2011

Policy uncertainty hampering growth and transformation

Many of these constraints and negative elements can be turned around through an efficient and effective bureaucracy and clear and direct leadership in DAFF and the provincial departments of agriculture. **It is usually the small things, which require no further requests to Treasury, but merely a realignment of resources in government, which will bring the biggest returns by unlocking the potential growth of the sector.** There are enough entrepreneurs – black and white – who will jump at greater policy certainty, improved incentives, security of tenure, secure water use rights and stability in the sector. **Positive agricultural growth is a prerequisite for successful transformation of the sector and positive growth can only occur through continued public and private sector investments.** The new entrants and land reform beneficiaries will only succeed if the fundamental enabling framework of government is in place. Successful completion of the land reform programme is necessary to address duality in the secor and to ensure a stable and growing agricultural and rural economy.

There is widespread concern in South Africa that **land reform has not been successful**. However, there is little consensus on what actually constitutes successful land reform in our circumstances: by what metric would we be prepared to declare success, and over what period of time? These are important questions, because they influence the state of mind of prospective land reform beneficiaries and hence whether they will be willing to invest in and protect the long term viability of the assets they obtain; of the officials who are responsible for the implementation of the programme; and of the policy makers who have to decide what to do next.

Furthermore, the long overdue liberalisation of foreign trade and deregulation of domestic markets that occurred in South African agriculture during the 1990s was unfortunately accompanied by a **dismantling of the farmer support** (in the form of access to financial services, extension, research and development, infrastructure, water, markets, property rights, etc.) that had been afforded to most commercial farmers and only some small scale and subsistence farmers. It is now clear that this latter process, which had already started before 1990, should preferably have taken the form of a redirection and rescaling in favour of small scale and emerging farmers rather than the indiscriminate dismantling that actually resulted. Unfortunately the support programs that followed have all been of a post hoc nature, with the result that they cannot materially influence the decisions that farmers make about desired farming enterprises, investments and farming practices. In addition – as highlighted earlier – the effectiveness of the remaining support and regulatory services has also dramatically deteriorated over time.

Where should the focus lie?

The NDP set out to address some of these shortcomings. In this regard, it was obvious that it is not possible to turn back the clock to a time where more labour was used per hectare of agricultural land without major restructuring of the sector, nor was it possible to expand dryland production substantially enough to create jobs. Therefore, the focus was on highlighting the potential contribution of labour intensive irrigated crops to growth and employment in the sector. After evaluating the performance of the sector since 2011 and the current policy environment that the sector faces, it is critical to re-assess strategies and approaches that will ensure that plans are actually put into actions within the context of the baseline.

To this extent, BFAP has been working with the Ministry of Finance and the National Planning Commission to develop a clear set of actions for the short, medium and long run that can ignite a new growth trajectory for the industry. Some of these principles are highlighted in this baseline by means of case studies. The list is not exhaustive by any means, but it provides tangible examples. This links into the basic principle of Operation Phakisa that has been adopted for agriculture and land reform. Set to take place in September and October 2016, it aims to formulate 3-feet level plans through heavily focused problem-solving "labs" bringing together all stakeholders within the sector.

Focus on productivity and inclusive value chains

Figure 6 illustrates the 10-year outlook of the real net farming income from the agricultural sector, as well as the gross income derived from the three main subsectors. Although the real net farming income is projected to recover significantly in 2017 under the assumption of normal weather and a further depreciation in the exchange rate, overall farm-level profitability in real terms is then expected to come under considerable pressure over the next few years as South Africa catches up with global commodity cycles of low agricultural prices in the midst of slower economic growth rates. This will dampen the overall growth in the livestock, horticulture and field crop industries over the period 2017-2020. After 2020, global commodity prices, especially for meats, are expected to rise again and combined with the projected recovery in domestic income growth and demand, this will induce another positive cycle for real net farming income.

Within the field crop sector, the sharp rise in agricultural commodity prices due to the drought was reinforced by the depreciation of the exchange rate. The exchange rate has also played a significant part not only in countering the collapse of

global commodity prices (Figure 7), but also in fuelling overall input costs and food price inflation.

Since the deregulation of the sector in the nineties, the area under dryland production has shrunk considerably as marginal production regions have become economically unsustainable. The total area under dryland production has stabilised over the past decade, mainly due to the commodity super cycle that has caused agricultural prices to increase in real terms. Furthermore, there have been significant productivity gains with higher yields and improved production practises. Figure 8 clearly illustrates that the gradual switch in area from grains (mainly white maize and wheat) to oilseeds (soya beans, sunflower and canola) that BFAP has been projecting for several years, is taking place and will continue following the correction after the drought.

Coming back then to the question of where the focus should lie to unlock growth in the dryland field crops industries, **the answer rests in investment into actions that will lead to productivity growth**. Since there is limited opportunity for expansion in hectares, further growth in dryland field crops really boils down to productivity growth in terms of higher yields and more efficient use of inputs. Particularly against the backdrop of the continued expected increase in the price of inputs such as fuel and fertiliser (Figure 9). Achieving such productivity gains mainly involves investment in research and extension. Figure 10 compares South Africa's average yields over the past five years for the main field crops to those of our main competing countries on the export and import markets. It also compares the average annual growth rates of the past decade to the projected rates of the next decade.

Average annual yield growth rates achieved for maize and wheat have been similar to those of our main competitors. In fact, if it weren't for the drought, the average annual rise in maize yields in South Africa would have exceeded 5% p.a. and therefore be in line with Brazil. Yet, growth rates of oilseed yields have been lagging behind. The baseline projects a very bullish outlook for oilseed yields over the next decade due to significant investment and advances in this industry that will likely result in faster growth rates going forward.

This leads to the question of inclusive value chains. Under DAFF's Agricultural Policy Action Plan (APAP) the aim is the revitalisation of value chains. In order for value chains to be sustainable, they have to be competitive and for this a bottom up approach has to be followed. For example, this baseline reports in detail on the relative competitiveness of the poultry industry and its vulnerability to high feed costs. Local producers in the formal market are faced with significant competition

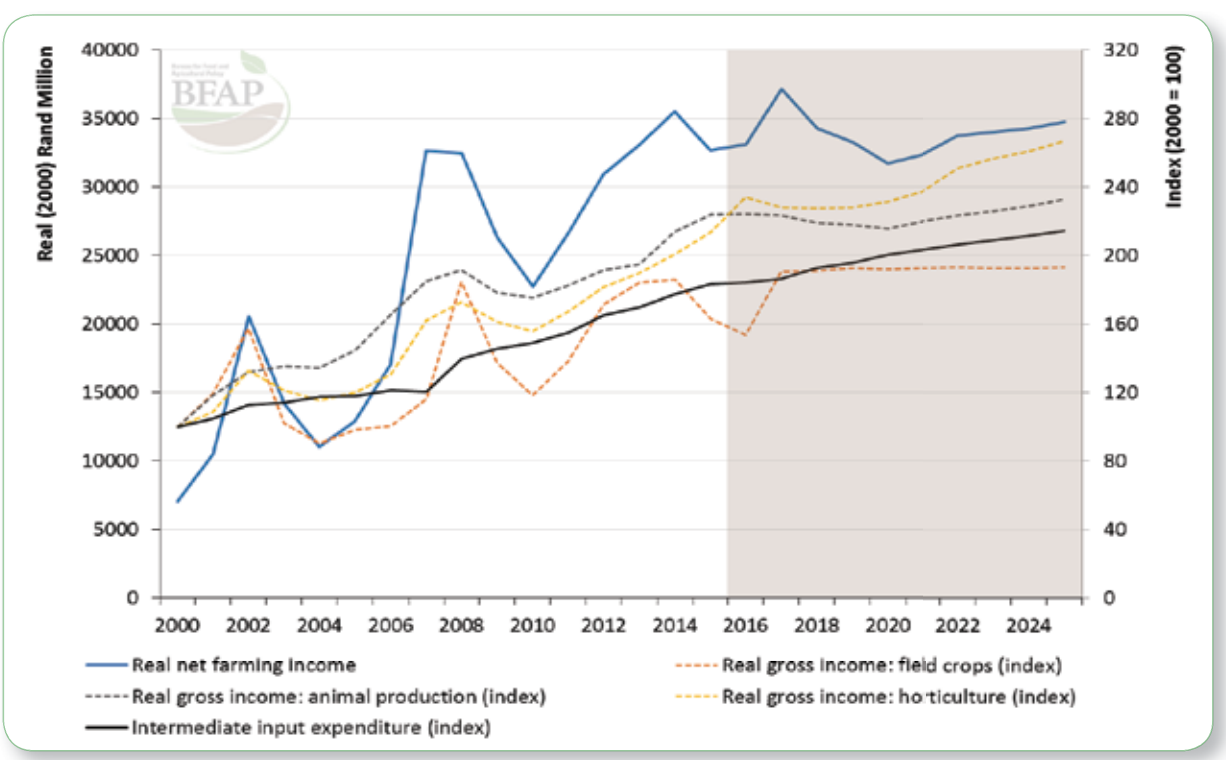


Figure 6: *Real net farming income and real gross income per industry*

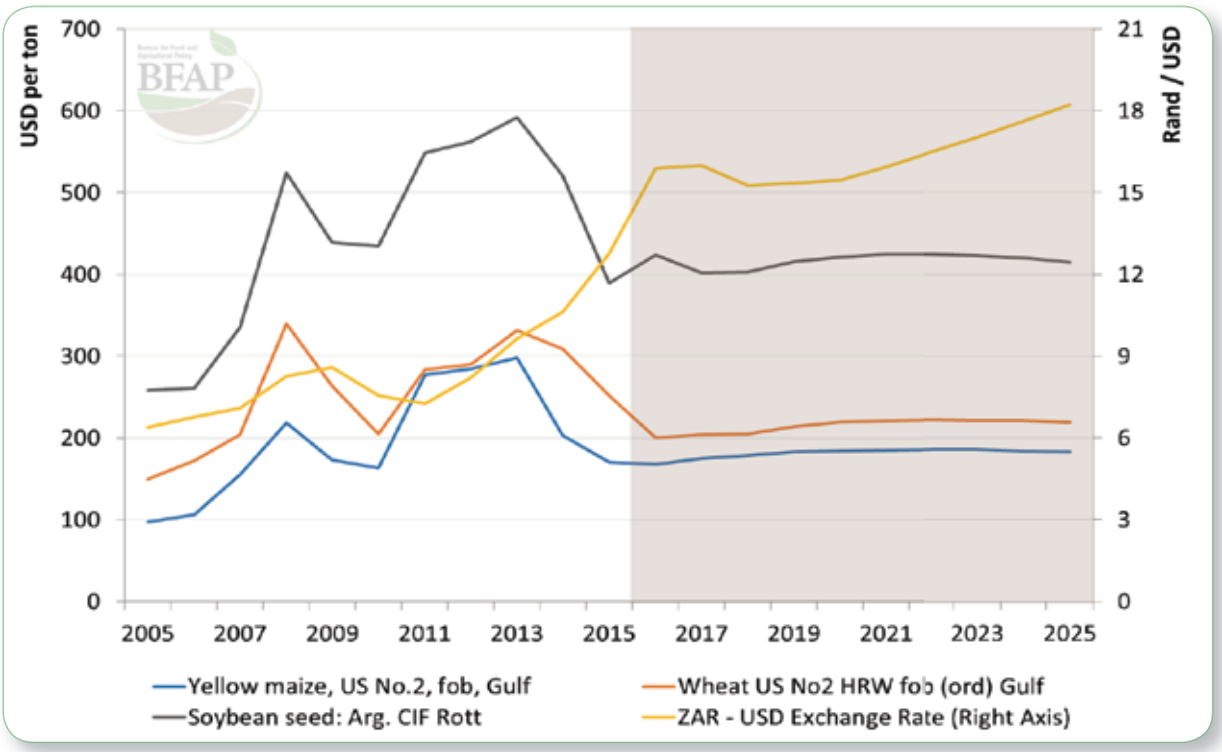


Figure 7: *The exchange rate and global commodity prices*

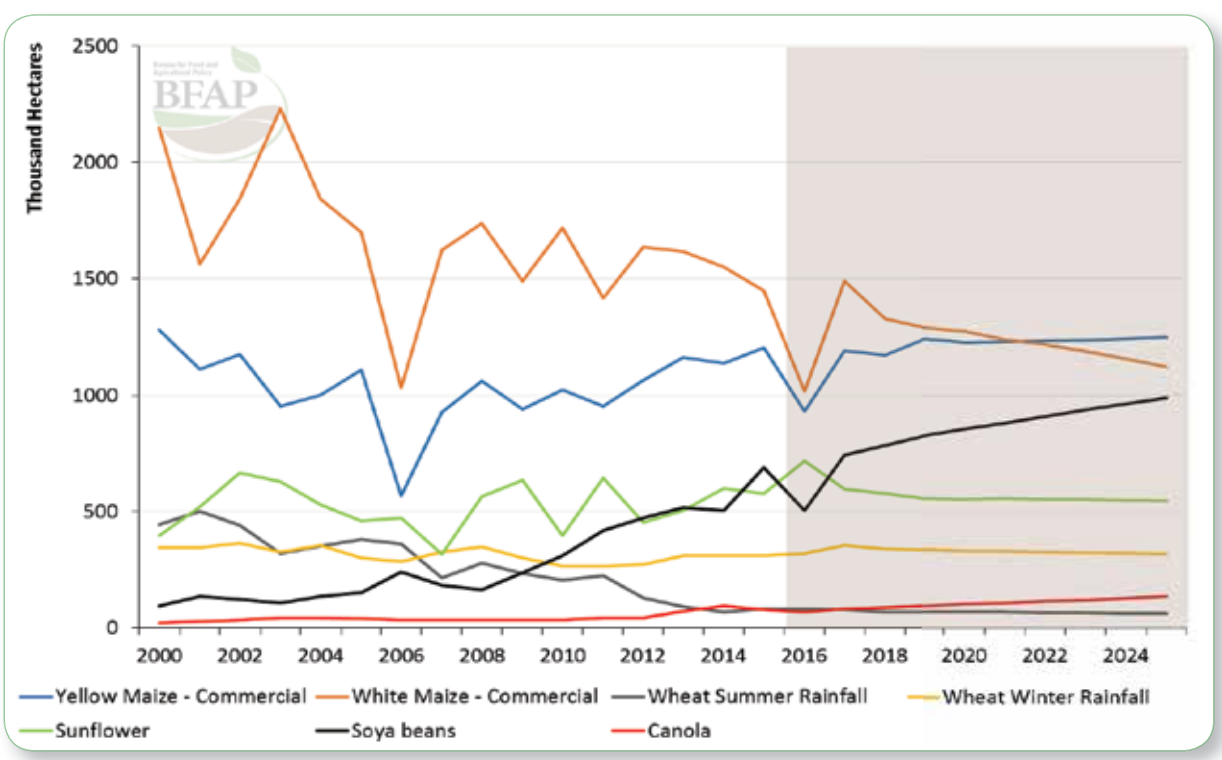


Figure 8: *Area under field crop production*

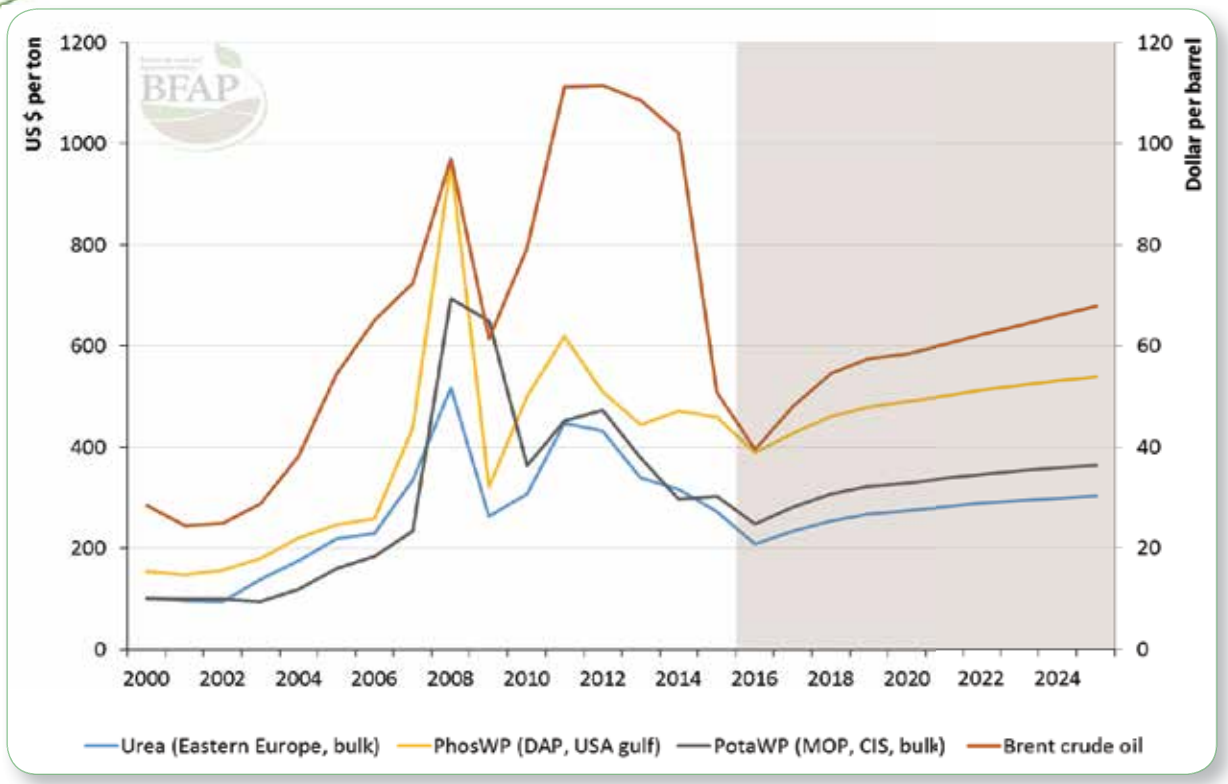


Figure 9: *Historic and projected price of fertiliser and oil.*

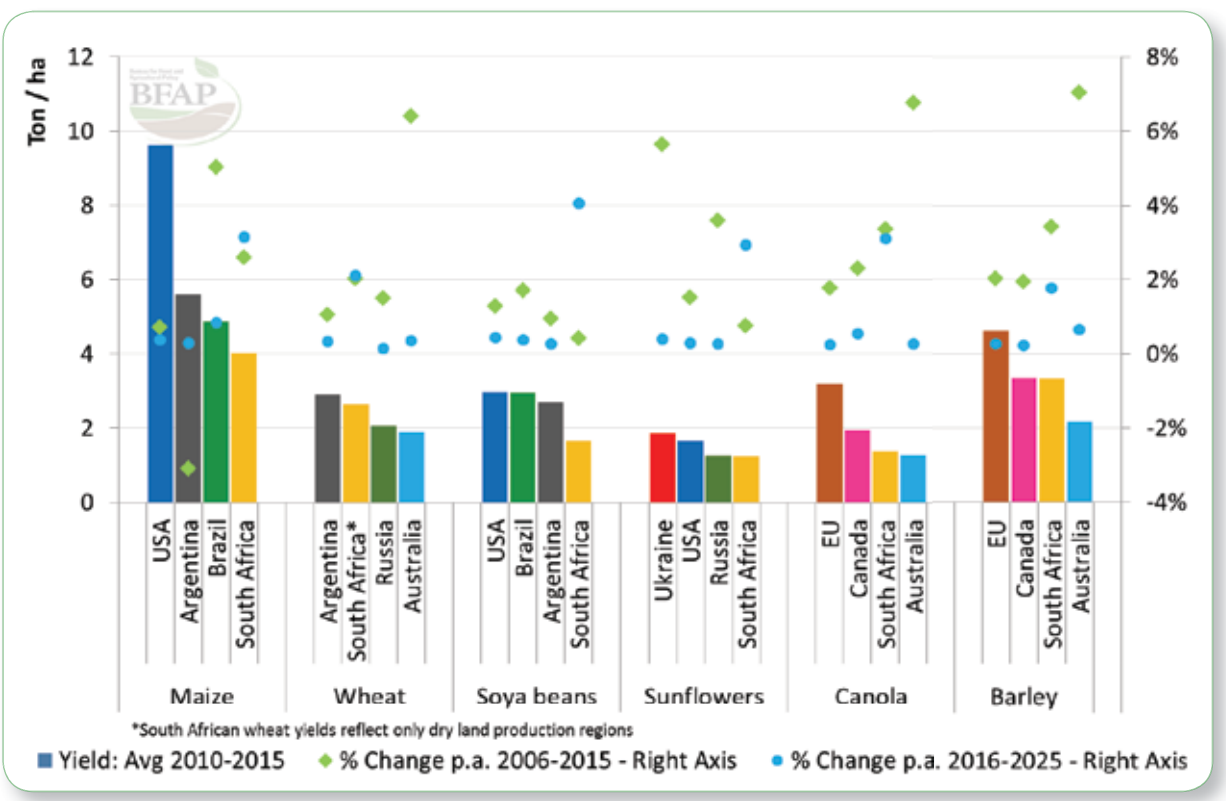


Figure 10: *South Africa versus international yields 2006-2015 vs 2016-2025*
Source: OECD-FAO outlook 2016 & BFAP 2016

from imported frozen, bone-in chicken cuts, especially from EU origin, which can be imported duty-free under the Trade Development Cooperation Agreement (TDCA). This question of competitiveness can be linked all the way back to the productivity at the farm gate of grain and oilseed producers. To be more specific, at what costs can the South African farmers produce a ton of maize or soya beans for the poultry industry? The analysis extends to the processing of the feedstock. With the investment in more than 2 million tons of soya bean crushing capacity over the past five years and a local crop of around 1 million tons, local crushing plants' profitability is under pressure as high fixed costs due to lower utilisation have to be balanced with high costs of imported soya beans to supplement the local availability.

It is also crucial to point out that not all value chains have to link into the formal industry. To the contrary, results from BFAP's analysis of formal and informal poultry value chains (Figure 11) suggests that smaller chicken producers have higher production costs per bird, yet the market prices in the informal fresh markets are much higher than in the formal integrated value chains and therefore small-scale poultry production in rural areas can be quite profitable whilst playing an important role in the market.

Building a sustainable value chain has to involve all role players within the chain and any interventions at one level will have implications for the other stakeholders in the chain. Therefore, for any strategic interventions or investment to stimulate growth and speed up the transformation of the industry, for example the agri-parks, economic realities have to be taken into consideration with a clear understanding where in the chain the incentives and the investments need to be made.

Focus on trade promotion

Promoting trade of high value export orientated commodities remains central to any action plan that will generate growth and employment opportunities in the agricultural sector. This was also the main drive for the selection of crops with a high potential for growth in the NDP in 2011. As illustrated in Figure 12, most of these commodities have performed according to expectation, yet there are a number of bottlenecks that are limiting the potential for further growth over the baseline. The irony is that many of these constraints are linked to the alignment and execution of very basic administrative processes to comply with regulations in target export markets or the promotion of South

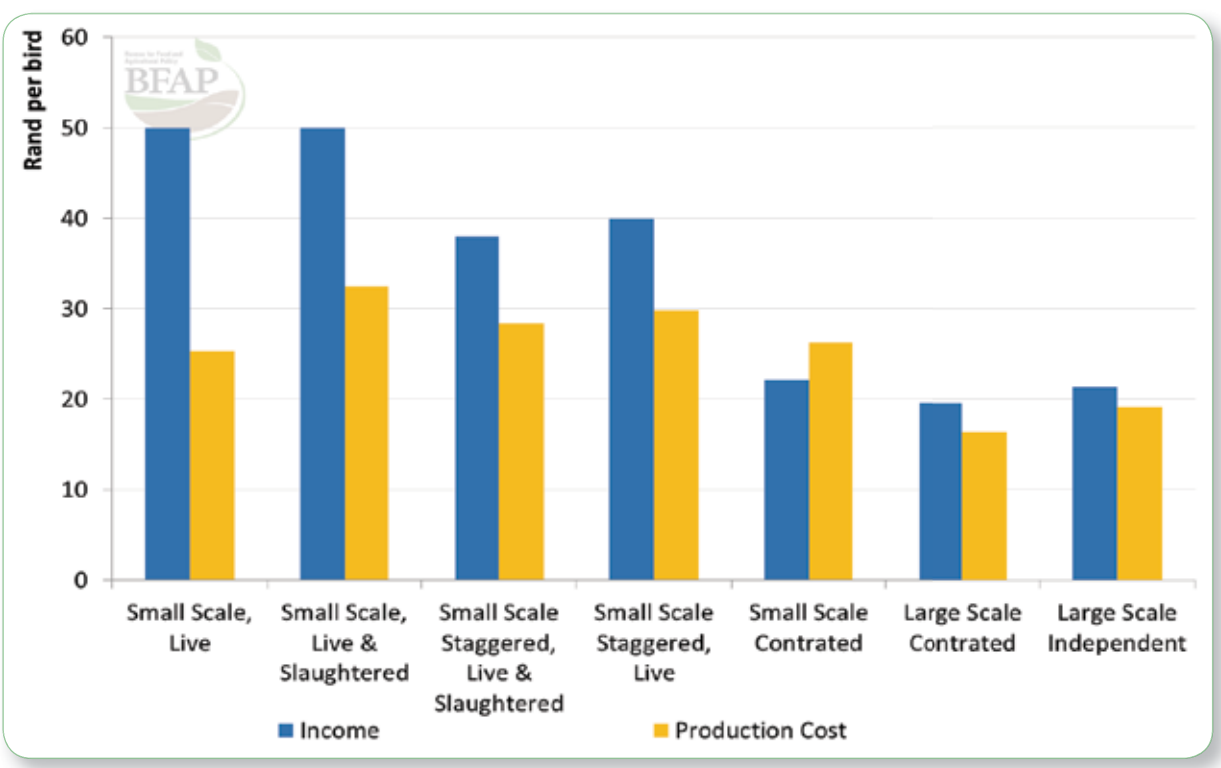


Figure 11: *South African broiler production: cost and income of different scale producers*
Source: BFAP, 2015

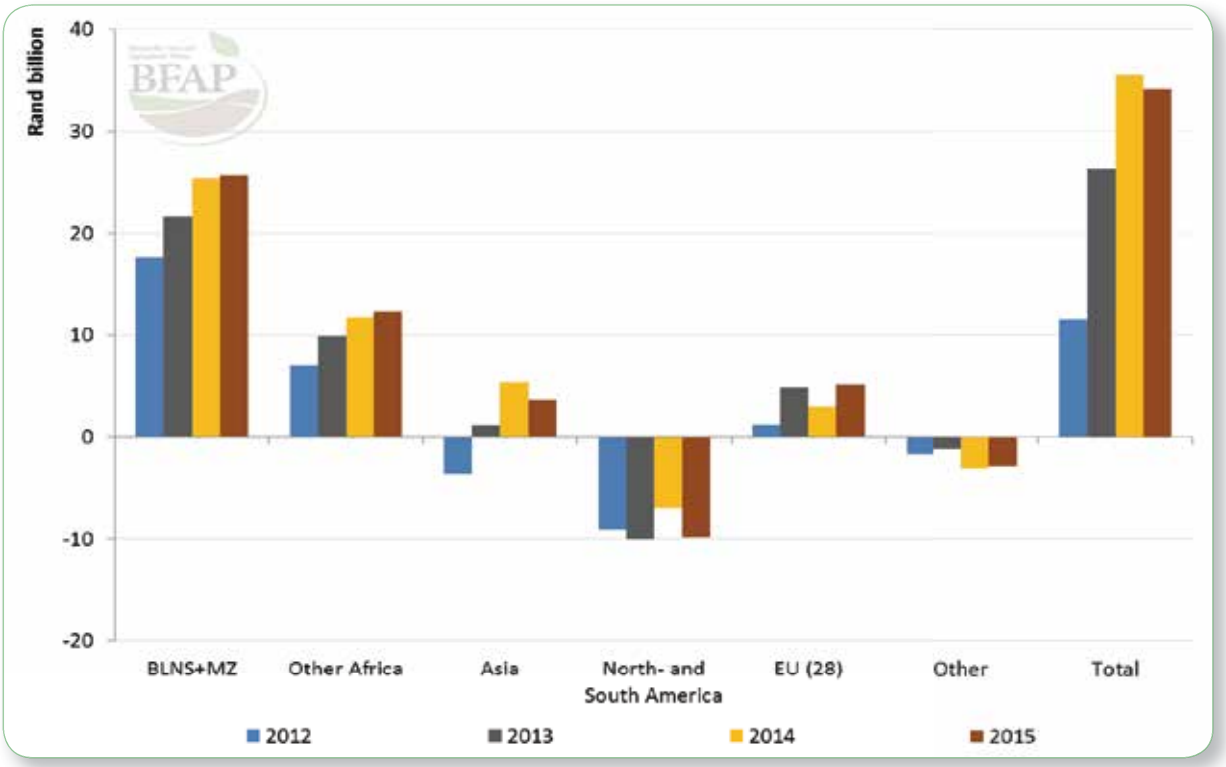


Figure 12: *South African agricultural net exports by region*
Source: ITC Trademap, 2016

African products in these markets. In order to support DAFF in an effort to unlock these opportunities, the fruit industry has recently seconded staff to provide additional human capacity to the Department to execute basic administrative processes.

Following the NDP, the directorate of International Trade at DAFF has developed an international market opportunity profile of the South African fruit industry. Furthermore, the introduction of the Fruit Industry Value Chain Roundtable has provided a platform for industry to engage with government and to identify key limiting factors. The challenge now is to link and coordinate this positive momentum to actions as well as to other initiatives across directorates and ministries. In terms of the regional focus, the importance of the African markets cannot be overemphasised. Figure 12 shows that the positive agricultural trade balance is essentially maintained by exports into the African continent, and more specifically the BLNS countries and Mozambique.

Focus on water

In the current environment of large scale and rapid urbanisation and the pressure to create employment opportunities that result in sustainable and dignified livelihoods, agricultural water use has had a rather low priority. However, the severe impact of the recent drought has again brought the importance of irrigation to the forefront as the country would have been dumped into a much worse position had irrigation not supplemented dryland production, not only to boost food production but also to provide vital support with respect to employment in the industry. In its initial research for the planning commission, BFAP showed that the actual water required to expand the total area under irrigation by 142 000 ha in order to contribute to a million job opportunities by 2030 was manageable, despite the major challenges the country faces with respect to water resources. This expansion was based on the assumption of a comprehensive implementation of the Water Administration System (WAS) on 600 000 ha under irrigation schemes. The Water Research commission (WRC) has already proven that savings in excess of 20% are achieved at irrigation schemes where WAS has been implemented. In the meantime, the Directorate of Water Use and Irrigation Development of DAFF has developed a strategy that identifies approximately 110 thousand hectares of potential revitalisation of irrigation schemes and a further 34 thousand hectares for expansion under irrigation. The basic motivation for expansion of land under irrigation remains the same. While technological change leads to a reduction over time in the labour requirement per hectare even on irrigated land, a rapid expansion of land served

by irrigation infrastructure would result in job creation that is substantial enough to make a difference over the 20 year planning horizon of the NDP. However, these proposals prompt two questions: does South Africa have the resources – not only the water but also the capital to gain access to the water, in order to accomplish this ambitious initiative; and secondly, who should the primary beneficiaries be?

On the first question, further research is needed and BFAP is currently working with the Ministry of Finance, DAFF, DWS, the National Planning Commission and industry to pin point and coordinate specific actions that are required to unlock further growth. Some of these actions require very basic interventions and some actions form part of a long-term strategic commitment, for example the National Water Investment Framework of DWS that will require an investment of R855 billion over the next ten years.

The second question on the unlocking of new resources is as important as the first question related to the availability of these resources. If the additional irrigation resources were to be allocated only to existing commercial farmers, increased production and increased employment would surely result. However, the structure of the agricultural sector, whose long-term sustainability has to be questioned, would remain unchanged. Furthermore, such a strategy would hardly be politically feasible in modern South Africa. On the other hand, if the new resources were to be channelled exclusively to small scale and emerging farmers under the current land reform policy frameworks, all of the current failures of the programme would merely be perpetuated. In the absence of a supporting environment even good managers would not be able to establish sustainable enterprises at any scale. **Even if all these resources are available it is not clear whether farmers will invest in long-term (capital and labour-intensive) enterprises in a climate where property and water use rights are uncertain**.

Focus on a conducive environment

The NDP proposals concentrated on the elements of a conducive environment, as well as on mechanisms that overcome the financing problem that all new entrants into primary agricultural production face. These proposals are currently being pursued by the agencies responsible for the implementation of land reform, and by a wide range of private efforts, of which the Witzenberg Initiative is the best known. However, the environment within which they are being developed has not changed materially, all but guaranteeing that the current dualism between white and black farmers will be perpetuated.

To this end, there needs to be a renewed focus on creating condusive environments for farming in South Africa that reflect the diversity of natural resources, of farmers, and of historical legacy if dualism is to be successfully eradicated. Here **the key to success lies in removing unnecessary bureaucratic constraints and setting up processes and incentives that allow experimentation with different approaches and cross fertilisation of ideas across jurisdictions.** There is always a danger in allowing local initiatives so much scope, but this can be managed on condition that the initiatives are steered as part of the normal democratic processes, i.e. they can't be captured by special interest groups such as the private sector, other commercial interests or community organizations. To this end the national authorities need to create the conditions, through policy statements, legislation, etc. and through greater policy consistency, in order to guide local initiatives. Importantly, this means that participants in land reform must be reassured that the objective of land reform will be that they gain beneficial rights over the land that they farm and the water that they are to use. Likewise, frameworks for ensuring access to farmer support elements such as ensuring land access, access to financial services and to markets, must also be created. Finally, the fiscal allocations required for infrastructure development must also be in place.

The message is simple: get the enabling conditions (a better functioning state and removing red tape and ineffective processes) in place, implement a range of models for land transfer to beneficiaries, ensure effective support to beneficiaries and eliminate political patronage for the land reform and agricultural programmes. We will then see a thriving and growing agricultural sector, which should provide fertile ground for new farmers to put down roots. Effective coordination between DRDLR and DAFF and the provincial departments will also be required to make this work. At the same time locally designed and private sector initiatives should be promoted so that we can in a short time see a sustainable, competitive, growing and transformed agricultural sector.

This year's baseline should be read with the above reasoning as backdrop. BFAP hopes to contribute the upcoming agricultural PHAKISA processes to show how the measures listed above can change the growth trajectory of South African agriculture. The country has entered a critical phase where tough choices will have to be made and implemented by strong and inclusive leadership.

KEY BASELINE ASSUMPTIONS

Policies

The baseline assumes that current international as well as domestic agricultural policies will be maintained throughout the period under review (2016 – 2025). In a global setting, this implies that all countries adhere to bilateral and multilateral trade obligations, including WTO commitments, as well as stated objectives related to biofuel blending mandates. On the domestic front, current policies are maintained. With the deregulation of agricultural markets in the mid-nineties, many non-tariff trade barriers and some direct trade subsidies to agriculture were replaced by tariff barriers. In the case of maize and wheat, variable import tariffs were introduced. The variable import tariff for wheat was replaced by a 2% ad valorem tariff in 2006. However, in December 2008 the original variable import levy system was re-introduced, and the reference price that triggers the variable import levy on wheat was adjusted upwards from $157/ton to $215/ton. Following the sharp increase in world price levels in 2012, the industry submitted a request for a further increase in the reference price, which was accepted in 2013, increasing the reference price to $294/ton.

Global maize prices have traded significantly higher than the reference price in recent years and international prices are not projected to fall below the reference price of $110 per ton over the next decade. Consequently, no maize tariff is applied over the Outlook. In contrast, wheat prices have already fallen below the reference price of $294/ton and consequently the import duty on wheat is triggered in 2015, remaining in place over the course of the Outlook as the projected world price for wheat remains below $294/ton. Ad valorem tariffs are applied in the case of oilseeds. In the case of meat and dairy products, a combination of fixed rate tariffs and/or ad valorem tariffs is implemented. General duties on imported chicken were increased substantially in October 2013, however a significant share of total imports originate from the European Union and therefore carry no duty under the TDCA. Furthermore, South Africa applies anti-dumping duties of R9.40 per kilogram on bone-in chicken pieces originating from the United States. In June 2015, it was announced that this anti-dumping duty would be removed for a quota of 65 thousand tons of bone-in portions originating from the United States. The projected tariff levels, as derived from the FAPRI projections of world commodity prices, are presented in Table 1.

Table 1: *Key policy assumptions*

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	R/ton										
Maize tariff: (Ref. price = US$ 110)	0	0	0	0	0	0	0	0	0	0	0
Wheat tariff (Ref price = US$ 294)	536	1495	1441	1359	1228	1159	1164	1187	1244	1286	1367
Sunflower seed tariff: 9.4 % of fob	491	636	620	583	593	615	641	668	688	705	719
Sunflower cake tariff: 6.6 % of fob	208	209	227	224	229	239	246	255	260	258	260
Sorghum tariff: 3 % of fob	1060	1310	1254	1203	1237	1302	1364	1427	1506	1574	1661
Soya bean tariff: 8 % of fob	73	73	78	76	78	79	82	86	88	90	92
Soya bean cake tariff: 6.6 % of fob	375	441	471	447	462	471	490	505	519	532	542
	Tons										
Cheese, TRQ quantity	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199
Butter, TRQ quantity	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167
SMP, TRQ quantity	4470	4470	4470	4470	4470	4470	4470	4470	4470	4470	4470
WMP, TRQ quantity	213	213	213	213	213	213	213	213	213	213	213
	Percentage										
Cheese, in-TRQ	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Butter, in-TRQ	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
SMP, in-TRQ	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
WMP, in-TRQ	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2

Table 1: *Key policy assumptions (Continued)*

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	c/kg										
Cheese, above TRQ rate	500	500	500	500	500	500	500	500	500	500	500
Butter, above TRQ rate	500	500	500	500	500	500	500	500	500	500	500
SMP, above TRQ rate	450	450	450	450	450	450	450	450	450	450	450
WMP, above TRQ rate	450	450	450	450	450	450	450	450	450	450	450
Beef tariff: max(40 %*fob,240c/kg)	1687	1955	1832	1684	1669	1673	1765	1880	1995	2104	2206
Lamb tariff: max(40 %* fob,200c/kg)	2278	2485	2251	2197	2247	2366	2506	2653	2790	2925	3056
Chicken tariff (Whole frozen): 82%	0	0	0	0	0	0	0	0	0	0	0
Chicken Tariff (Carcass): 31%	137	122	122	123	126	129	131	133	135	136	136
Chicken Tariff (Boneless Cuts): 12%	1752	1945	1952	1883	1944	2001	2096	2202	2304	2393	2490
Chicken Tariff (Offal): 30%	294	326	327	316	326	335	351	369	386	401	417
Chicken Tariff (Bone in portions): 37%	173	192	193	186	192	197	207	217	227	236	246
Pork tariff: max(15 %* fob, 130c/kg)	212	245	242	247	263	277	292	301	305	309	315

Macroeconomic assumptions

To some extent, the baseline simulations are driven by the outlook for a number of key macroeconomic indicators. Projections for these indicators are mostly but not exclusively based on information provided by the OECD, the IMF and the Bureau for Economic Research at the Univercity of Stellenbosch.

Table 2: *Key macro-economic assumptions*

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Millions										
Total population of SA	54.5	55.0	55.4	55.9	56.3	56.7	57.0	57.4	57.8	58.1	58.4
	US $/barrel										
Brent Crude oil	50.8	39.6	48.0	54.7	57.6	58.5	60.3	62.2	64.1	66.0	67.9
	SA cents/Foreign currency										
Exchange rate (SA cents/US$)	1277	1590	1601	1527	1535	1545	1594	1648	1704	1762	1823
Exchange rate(SA cents/Euro)	1485	1482	1533	1561	1621	1650	1682	1713	1748	1784	1823
	Percentage change										
Real GDP per capita	1.28	0.38	1.28	2.20	2.60	2.80	2.90	2.74	2.88	2.87	3.15
GDP deflator	4.63	6.08	6.17	5.70	5.70	5.70	5.70	5.89	6.11	5.53	5.57
	Percentage										
Weighted prime interest rate	9.4	10.6	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8

OVERVIEW

SOUTH AFRICAN
CONSUMER PROFILE

The consumer analysis presents a discussion of the dynamic South African consumer landscape which underpins the modelling projections presented in this edition of the BFAP baseline.

THE CONSUMER ANALYSIS PRESENTS a discussion of the dynamic South African consumer landscape which underpins the modelling projections presented in this edition of the BFAP baseline. The analysis includes general information on the demographic characteristics of South African consumers, dynamic changes in South Africa from a socio-economic perspective and preference trends affecting the food choices of particularly middle and high income consumers.

Demographics of the South African Consumer

The LSM® (Living Standards Measure) segments of the South African Audience Research Foundation (SAARF) are a widely acknowledged approach to describe the socio-economic characteristics of South African households. The SAARF LSM segments are not directly based on the income levels of consumers, but are built upon consumers' access to various amenities, such as durables, household location, and dwelling type (www.saarf.co.za). A summary profile of the South African consumer market according to the SAARF LSM® segment is presented in Figure 13 and Table 3. Four lifestyle levels could be defined within the LSM spectrum as illustrated by Figure 13.

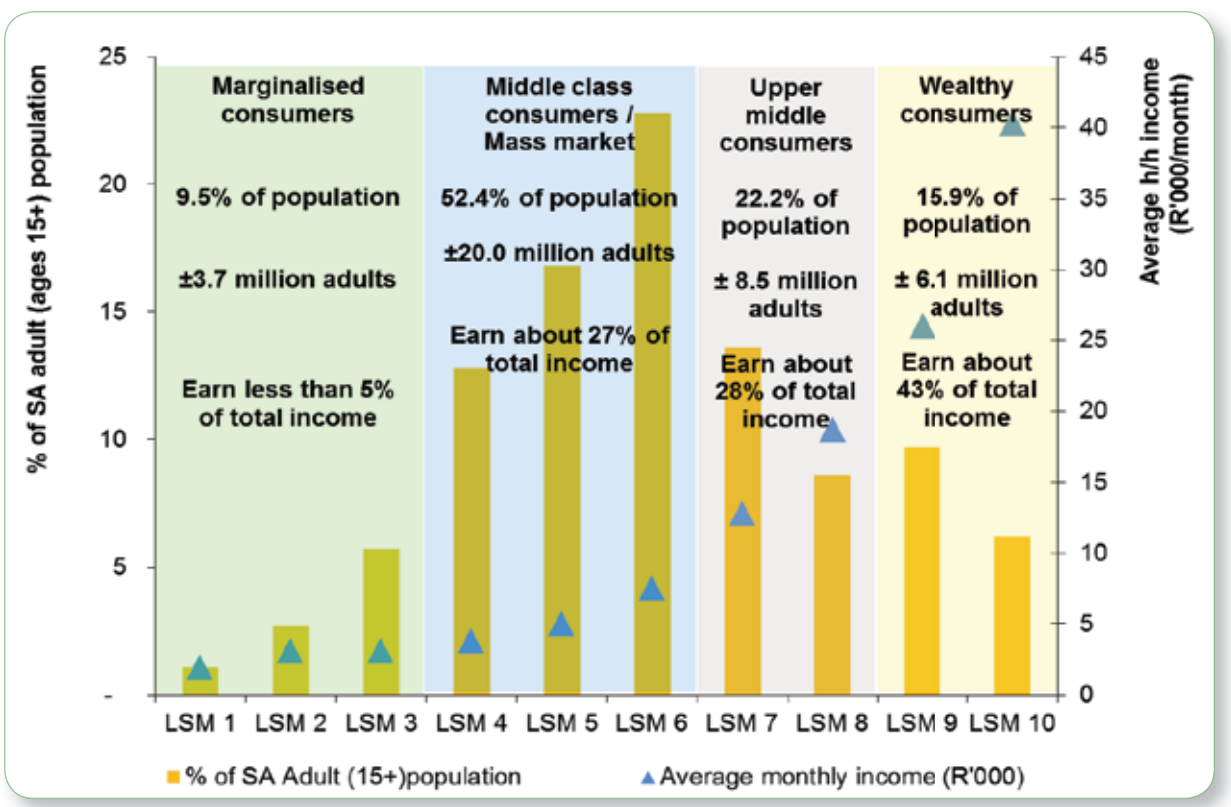


Figure 13: *The SAARF LSM Segments: Proportion of SA adult population and average monthly household income in 2013/2014*
Source: SAARF All Media and Products Survey (AMPS) 2013, 2014

Table 3: A summary of the South African consumer market in 2013 based on the SAARF LSM segments

LSM ®:	% of SA adults*:	Average household monthly income***:	Dominant age groups**:	Dominant education level**:	Dominant location (rural/ urban)**:	Dominant Provincial location**:	Unemployment % – self reported ***:	Dominant dwelling type***:	Electricity in home***:	Tap water in home/on plot***:
1	1.1%	R1 968	50+ and 35-49	Up to primary completed & Some high schooling	100% rural	E Cape (64%) Mpumalanga (10%) KZN (8%)	35.6%	Traditional hut	34%	0%
2	2.7%	R3 095	50+ and 15-24	Some high schooling & Up to primary completed	95.3% rural	KZN (32%) E Cape (28%)	43.8%	Traditional hut & House/cluster house/ town house	48%	12%
3	5.7%	R3 082	50+ and 15-24	Some high schooling & Up to primary completed	89.6% rural	E Cape (26%) KZN (20%) Limpopo (13%)	36.5%	Traditional hut & House/cluster house/ town house	78%	29%
4	12.8%	R3 798	15-24 and 50+	Some high schooling & Matric	85.6% rural	KZN (20%) Limpopo (19%) E Cape (19%)	44.1%	House/cluster house/ town house & Traditional hut	95%	52%
5	16.8%	R5 047	15-24 and 25-34	Some high schooling & Matric	57% rural 43.0% urban	Gauteng (18%) KZN (15%) E Cape (15%) Limpopo (13%)	37.2%	House/cluster house/ town house & Matchbox/Improved matchbox	98%	82%
6	22.8%	R7 550	25-34 and 35-49	Some high schooling & Matric	82.9% urban	Gauteng (24%) W Cape (15%) E Cape (15%) KZN (13%)	33.8%	House/cluster house/ town house & Matchbox/Improved matchbox	99%	97%
7	13.6%	R12 789	25-34 and 35-49	Matric (43%) Some high schooling (36%)	93.2% urban	Gauteng (28%) W Cape (18%) KZN (14%) E Cape (14%)	25.8%	House/cluster house/ town house & Flat	100%	99%

Table 3: *A summary of the South African consumer market in 2013 based on the SAARF LSM segments (continued)*

LSM ®:	% of SA adults*:	Average household monthly income***:	Dominant age groups**:	Dominant education level**:	Dominant location (rural/ urban)**:	Dominant Provincial location**:	Unemployment % – self reported ***:	Dominant dwelling type***:	Electricity in home***:	Tap water in home/on plot***:
8	8.6%	R18 728	50+ and 25-34	Matric & Some high schooling	95.1% urban	Gauteng (30%) W Cape (18%) KZN (16%) E Cape (12.3%)	25.8%	House/cluster house/ town house (87%) Flat (11%)	100%	100%
9	9.7%	R26 037	35-49 and 50+	Matric & University / Technicon	95.3% urban	Gauteng (31%) W Cape (17%) KZN (19%) E Cape (10%)	13.2%	House/cluster house/ town house and Flat	100%	100%
10	6.2%	R40337	50+ and 35-49	University / Technicon & Matric	96.2% urban	KZN (34%) Gauteng (32%) W Cape (14%)	5.2%	House/cluster house/ town house (99%)	100%	100%

*Source: *AMPS 2014B; ** AMPS 2014A; ***AMPS 2013B*

From a spatial perspective Figure 14 presents the distribution of the LSM segments within the various provinces of South Africa:

- Marginalised consumers (LSM 1 to 3) reside mainly in the Eastern Cape, KwaZulu-Natal and Limpopo. The marginalised consumers in these provinces represent about 75% of the total number of marginalised consumers in South Africa.
- Middle class consumers (LSM 4 to 6) reside mainly in Gauteng, KwaZulu-Natal, Limpopo and the Eastern Cape. The middle class consumers in these provinces represent about 66% of the total number of middle class consumers in South Africa.
- Upper-middle class consumers (LSM 7 to 8) reside mainly in Gauteng, Western Cape and KwaZulu-Natal. The upper-middle class consumers in these provinces represent about 71% of the total number of upper-middle class consumers in South Africa.
- Wealthy consumers (LSM 9 to 10) reside mainly in Gauteng, KwaZulu-Natal and Western Cape. The wealthy consumers in these provinces represent about 79% of the total number of wealthy consumers.

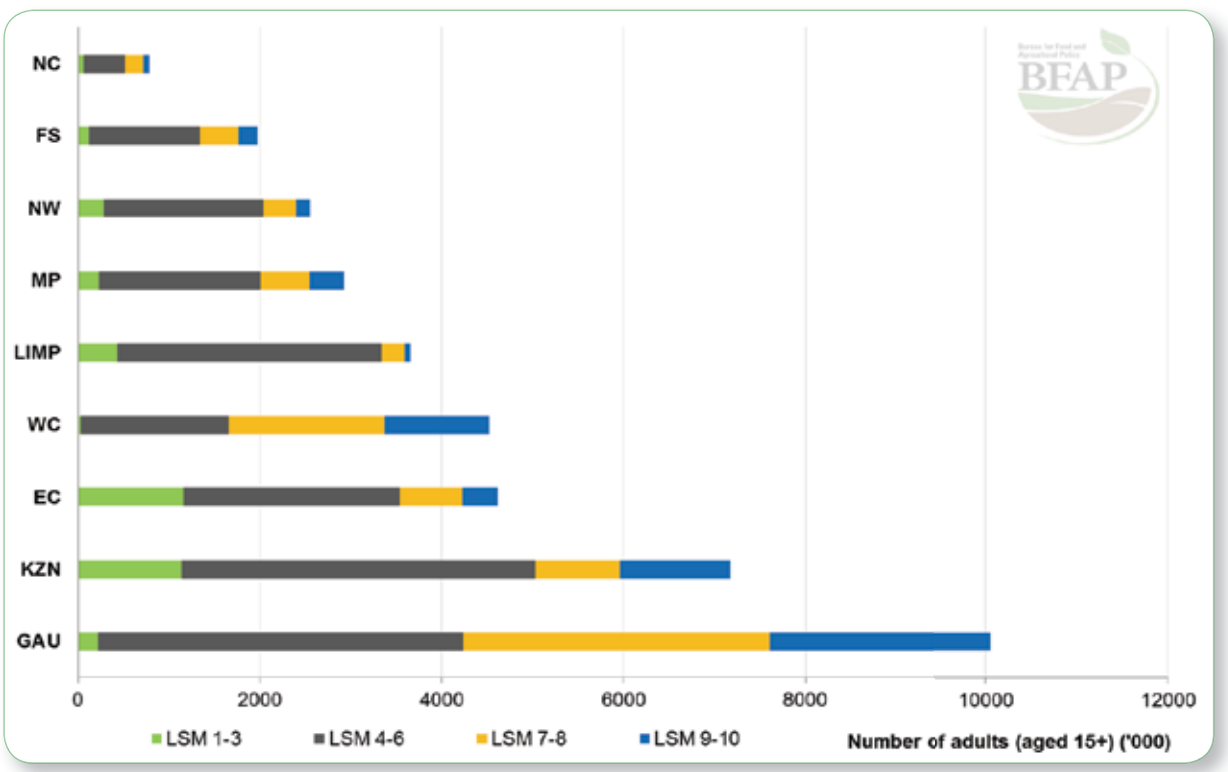


Figure 14: *Distribution of the SAARF LSM Segments within the nine provinces of South Africa during 2015*
Source: SAARF All Media and Products Survey (AMPS) 2015

Dynamics in the South African consumer environment:

RISING INCOME

SAARF LSM AMPS data indicates that average monthly income across the population increased from R6 928 in 2009 to R11 276 in 2015, representing a 62.8% nominal increase and a 19.6% real increase. Table 4 presents the changes within the various income brackets over this time period. Comparing 2015 to 2009 the share of the population with a household income of less than R5000 decreased from 56% to 37%, while the share of the population with a household income of R5000 or more increased from 44% to 63%.

CLASS MOBILITY

Class mobility, defined as the movement of consumers towards higher LSM groups, has been a key feature of the South African consumer landscape for many years. From 2005 to 2015 the share of South African adults within SAARF LSM® segments 1-3 declined (-70%), accompanied by an increase in the share of the adult population classified within LSM 4-6 (referred to as middle class in this document) (+23%), as well as LSM 7-8 (upper middle class) (+65%) and LSM 9-10 (wealthy consumers) (+32%) (Figure 15). In recent years the class mobility rate has

Table 4: *Changes in household income brackets: comparing 2009 to 2015*

Total population average monthly household income:	2009		2015	
	Share of adult population:			
R1 – R799	5.7%		1.7%	
R800 – R1 399	17.1%	**56%**	5.4%	**37%**
R1 400 – R2 499	14.6%		8.4%	
R2 500 – R4 999	19.0%		21.2%	
R5 000 – R7 999	13.8%		18.9%	
R8 000 – R10 999	10.2%	**44%**	12.0%	**63%**
R11 000 – R19 999	10.3%		14.4%	
R20 000+	9.3%		18.7%	

Source: AMPS 2009; AMPS 2015

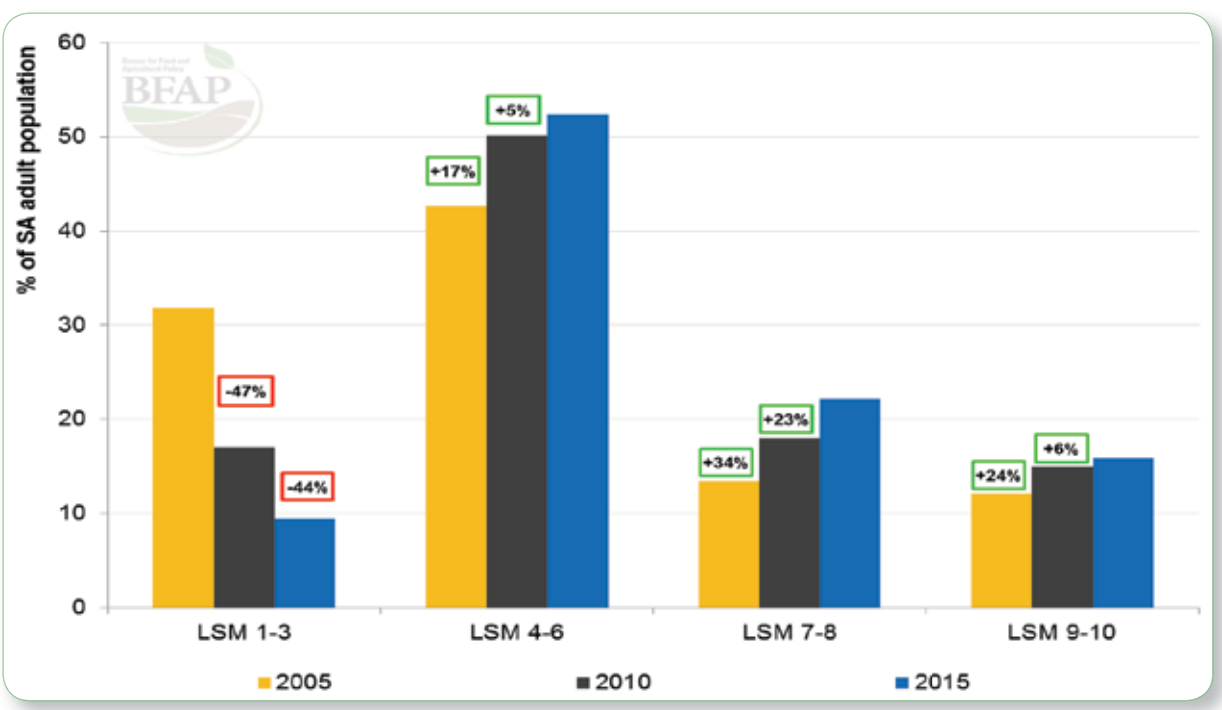


Figure 15: *LSM class mobility: All adults for the period 2005, 2010 and 2015*
Source: SAARF All Media and Products Surveys (AMPS) 2005, 2010, 2015

been variable, but generally slower in 2014/2015 compared to 2013/2014 following a general peak in 2011/2012. The class mobility rate also slowed down from 2007/2008 to 2009/2010, linked to recession.

URBANISATION

Data on the level of urbanisation in South Africa varies between sources:

- Statistics South Africa Census 2011: 62%
- Statistics South Africa Income and Expenditure Survey 2010/11: 67%
- SAARF AMPS 2015AB: 65%

Regardless of the differences, all the sources confirm the increasing trends in urbanisation, as illustrate in Figure 16 based on the SAARF AMPS data. Figure 16 illustrates that the rural population size increased by only 9% from 2007 to 2015 and from 2010 onwards has declined somewhat, while the urban population expanded by a significantly higher 32%.

AGE DISTRIBUTION

South Africa has a relatively young population, with 49% younger than 25 years of age and 67% younger than 35 years of age in 2011. Median population age data indicates that the population is gradually ageing; increased from 23 years according to Census 2001 to 25 years according to Census 2011. The SAARF AMPS data presented in Figure 17 also confirms the gradually ageing population in South Africa. In 2010 people

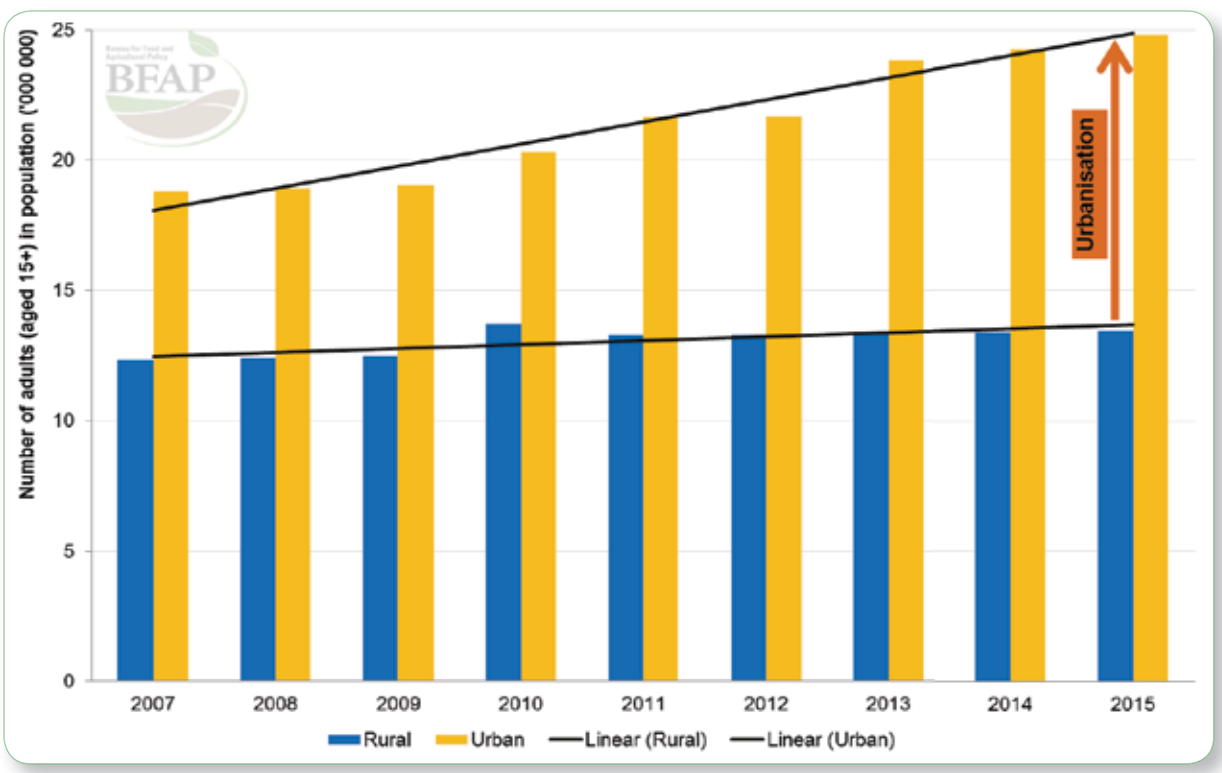


Figure 16: *Urbanisation according to SAARF AMPS data for the period 2007 to 2015*
Source: SAARF AMPS 2007 to 2015

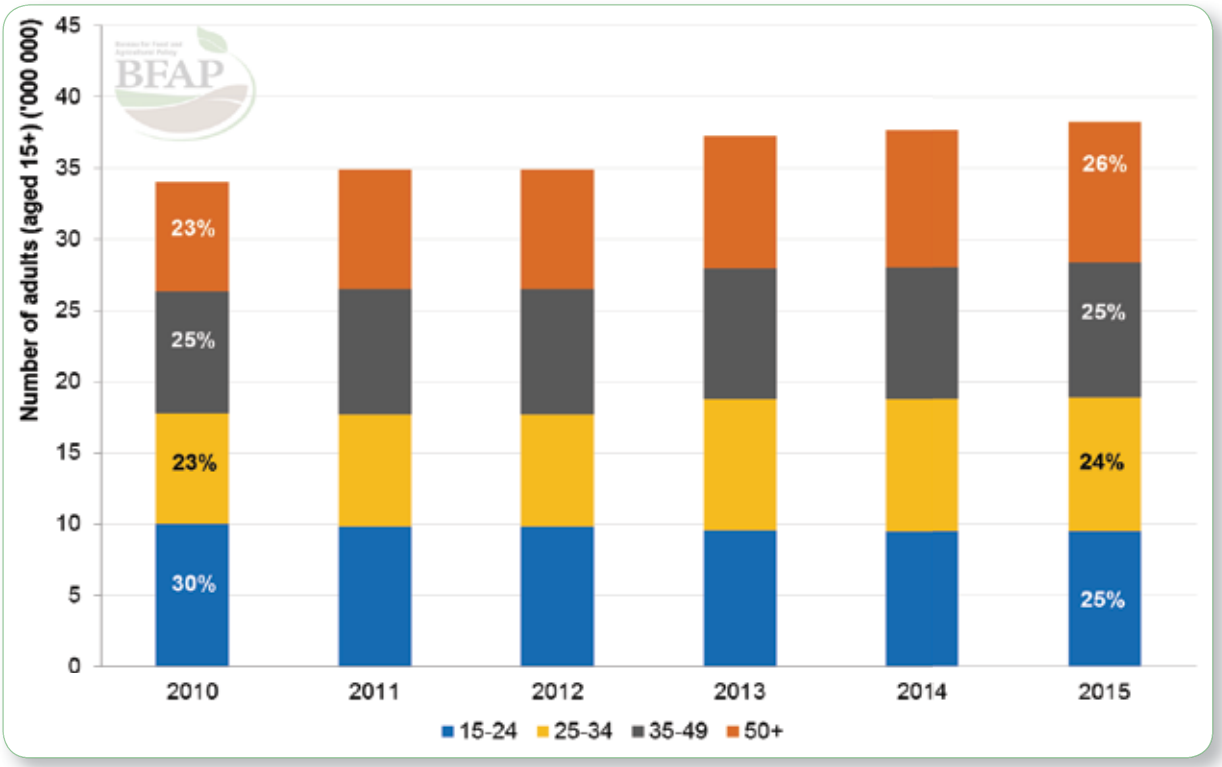


Figure 17: *The dynamic age distribution in South Africa – a view on 2010 to 2015*
Source: SAARF AMPS 2010 to 2015

aged 35 and older represented 47.1% of the adult population, increasing to 50.6% in 2015.

UNEMPLOYMENT

Unemployment data can be obtained from different sources, a summary of which is presented in Table 5. In the fourth quarter of 2015, at provincial level the lowest unemployment levels were found in Western Cape (19.49%) and KwaZulu-Natal (20.5%), while the highest unemployment levels were found in the Free State (29.8%), Eastern Cape (27.4%), Gauteng (27.6%), Northern Cape (25.8%) and Mpumalanga (25.7%) (Stats SA Quarterly Labour Force Survey, February 2016).

In terms of age groups the highest unemployment levels are found among adults aged 15 to 34 years. Amongst individuals aged 15 to 24 years, the unemployment rate was 50.4% in the fourth quarter of 2015, whilst this rate declines to 29.1% for individuals aged 25 to 34 years (Stats SA Quarterly Labour Force Survey, February 2016).

Table 5: *Unemployment in South Africa*

Source:	**Unemployment rate:**		**Comments:**
	Past value:	**Recent value:**	
Census data	2001: 41.6%	2011: 29.8%	Decreasing trend in all provinces
Stats SA Quarterly Labour Force Survey	Q1 2015: 26.4%	Q4 2015: 24.5%	Somewhat lower than the high point in Q1 2015

Source: StatsSA (2016)

DEBT

South African consumers have been moving consistently deeper into debt toward the fourth quarter of 2015 with the following changes occurring from early 2009 (National Credit Regulator statistics):

- The total Rand value of credit granted increased by 140.1% to R124.1 billion, 5.5% higher than the level of R117.6 billion in the 4th quarter of 2014 (Figure 18);
- The number of credit applications received increased by 98.5% to 11.32 million being somewhat lower than the high level of 11.81 million reported for the fourth quarter of 2012;
- The credit application rejection rate increased from 43.9% to 52.0%, being lower than the high level of 59.0% reported for the first quarter of 2014;
- Since the first quarter of 2009, the number of active credit accounts has increased by 18.6% to reach a value of R41.2 million in the fourth quarter of 2015 (Figure 18).
- In the fourth quarter of 2015, 42% of credit facilities were granted to consumers with less than R5500 income per month, while these credit grants contributed about 9% in value terms.

The pressure experienced by consumers is also reflected by the FNB/BER Consumer Confidence Index of -14, at a similar level to the decade low of -15 points reported in 2015.

What are South African consumers eating?

A scientifically sound understanding of food consumption patterns is critical for a number of reasons, including:

- Determining dietary adequacy and household food insecurity;
- Informing public policy, e.g. fortification of maize meal and bread (2005);
- Analysing food affordability and the impact of food price changes on consumers from different socio-economic groups.

There are two main approaches to studying food consumption patterns: Dietary intake studies and the analysis of food expenditure data. Recently, Steyn et al (2015) examined all dietary studies conducted among South African adults since

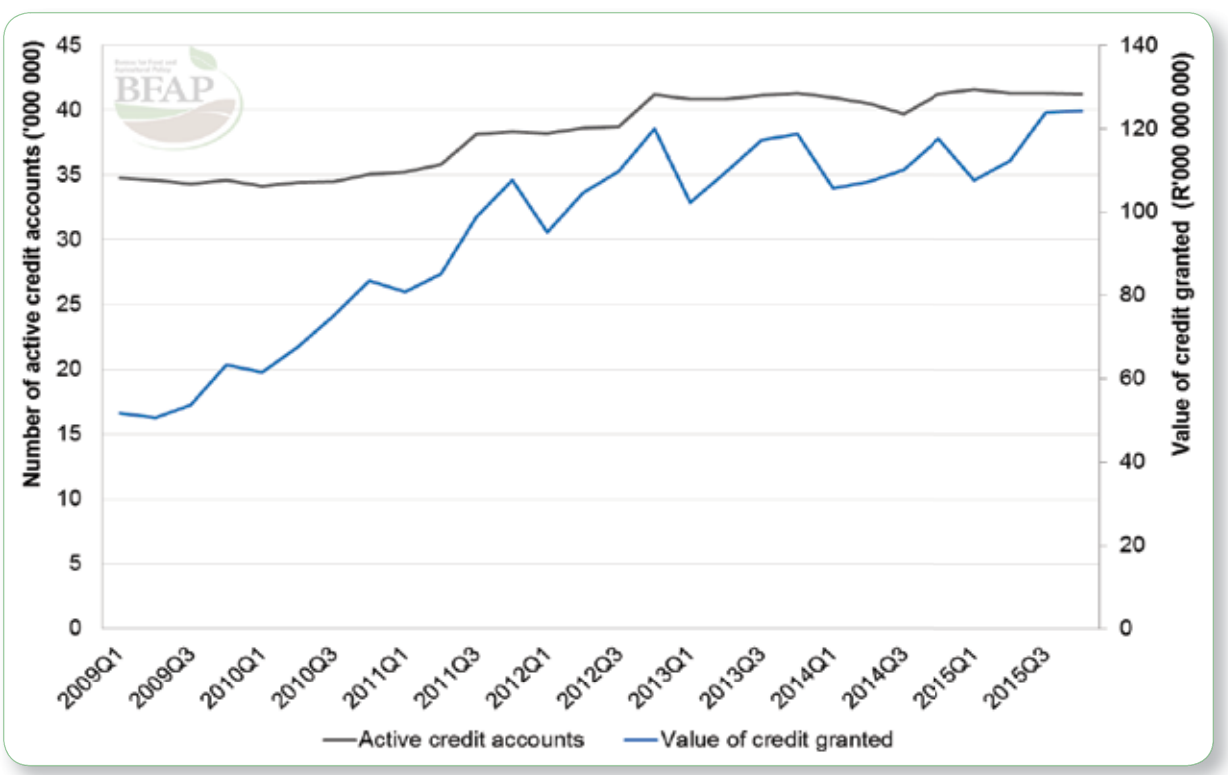


Figure 18: *Consumer debt in South Africa*
Source: National Credit Regulator statistics

2000 to determine gaps and deficiencies. The studies had to adhere to the following criteria: Normal healthy adults free of known disease conditions; Participants at least 14 years old; Participants not breastfeeding or pregnant; Sample sizes of age groups / gender included at least 30 participants per group; Participants were not disabled. The examination focused on four types of data: foods consumed, macronutrient intakes, micronutrient intakes and dietary diversity. In terms of food intake the ten most commonly consumed foods are summarised in Table 6. Following the review, Steyn et al (2015) identified the following problems with the reviewed data:

1. Not representative of all provinces and of urban/rural areas

2. Different dietary methods used to collect data

3. Some sample sizes were very small

4. Little data available on foods and portion sizes

5. There is not sufficient data available to make up a common food basket

In summary, according to the food intake studies the most widely consumed foods in South Africa among adults are: Sugar, tea, maize porridge, brown bread, full cream milk, coffee, boiled cabbage, stock / salt, white bread, margarine, rice / potatoes and fruit.

From a food expenditure perspective, Table 7 presents an overview of the dominant food options in South Africa according to the Statistics South African Income and Expenditure Survey 2010/2011. The listed options generally represent about 90% of expenditure within the various food categories (in order of expenditure importance).

The summary data presented in Table 8 highlights the importance of chicken, maize meal, brown bread, sugar, rice, edible oils and beef in the food basket of poorer consumers in South Africa.

Table 6: *Ten most commonly consumed foods in South Africa: dietary study perspective*

Study on secondary Analyses (Nel & Steyn, 2002)	Informal settlement-Vaal (Oldewage-Theron & Kruger, 2011)	Bloemfontein men (Tydeman-Edwards, 2012)	Bloemfontein women (Tydeman-Edwards, 2012)
Sugar	Maize porridge stiff	Sugar	Sugar
Tea	Sugar	Porridge	Porridge
Maize porridge	Tea	Stock/salt	Tea
Brown bread	Cabbage boiled	Tea	Stock/salt
Full-cream milk	Brown bread	Full cream milk	Margarine
Coffee	Whole Milk	Coffee	Full cream milk
White bread	Spinach	Margarine	Bread
Margarine	Maize porridge soft	Bread	Fruit
Potatoes	Tomato & onion stewed	Fruit	Vegetables
Rice	Rooibos tea	Vegetables	Coffee

Table 7: *Dominant food choices in South Africa per food group according to StatsSA IES 2010/2011*

	Population	Poorest 30%	Lower middle class	Upper middle class	Wealthiest 20%
Starchy staples:	Maize meal Brown bread Rice White bread Potatoes Wheat flour Baked products Breakfast cereals	Maize meal Brown bread Rice White bread Potatoes Wheat flour	Maize meal Brown bread Rice White bread Wheat flour Potatoes	Maize meal Brown bread White bread Rice Wheat flour Potatoes Breakfast cereals	Brown bread White bread Baked products Breakfast cereals Rice Maize meal Potatoes Wheat flour Pasta
Animal protein foods	Chicken Beef Beef sausage Mutton & Lamb	Chicken Beef Eggs Canned pilchards	Chicken Beef Eggs Beef sausage	Chicken Beef Beef sausage Eggs	Chicken Beef Mutton & Lamb Beef sausage

Table 7: *Dominant food choices in South Africa per food group according to StatsSA IES 2010/2011 (Continued)*

	Population	Poorest 30%	Lower middle class	Upper middle class	Wealthiest 20%
Animal protein foods (continued)	Eggs Canned pilchards Polony Fresh / frozen / chilled fish Pork	Beef sausage Polony	Canned pilchards Polony Mutton & Lamb	Mutton & Lamb Canned pilchards Polony Fresh/frozen/chilled fish	Eggs Pork Fresh/frozen/chilled fish Polony Viennas Canned pilchards
Fats, oils	Edible oils (eg cooking oils) Margarine Peanut butter	Edible oils (eg cooking oils) Margarine	Edible oils (eg cooking oils) Margarine	Edible oils (eg cooking oils) Margarine Peanut butter	Edible oils (eg cooking oils) Margarine Peanut butter Butter
Dairy	Full cream milk Eggs Cheese Yoghurt Sour milk/maas Whiteners	Full cream milk Eggs Sour milk/maas Whiteners Yoghurt Powdered milk	Full cream milk Eggs Sour milk/maas Yoghurt Whiteners Powdered milk	Full cream milk Eggs Sour milk/maas Cheese Yoghurt Whiteners	Full cream milk Cheese Eggs Yoghurt Low fat milk Sour milk/maas
Vegetables	Tomatoes fresh Onions Cabbage fresh Beans dried Baked beans in tomato sauce Mixed vegetables fresh Mixed vegetables frozen Pumpkin / Butternut fresh Carrots fresh Spinach/morogo fresh	Tomatoes fresh Cabbage fresh Onions Beans dried Baked beans in tomato sauce Spinach/morogo fresh Mixed vegetables fresh Atchar Butternut fresh Carrots fresh	Tomatoes fresh Onions Beans dried Cabbage fresh Baked beans in tomato sauce Mixed vegetables fresh Atchar Spinach/morogo fresh Butternut fresh Carrots fresh	Tomatoes fresh Onions Baked beans in tomato sauce Cabbage fresh Beans dried Mixed vegetables fresh Butternut fresh Carrots fresh Mixed vegetables frozen Carrots fresh Atchar	Tomatoes fresh Onions Cabbage fresh Beans dried Baked beans in tomato sauce Mixed vegetables fresh Mixed vegetables frozen Butternut fresh Carrots fresh Spinach/morogo fresh
Fruit	Apples Bananas Oranges Avocados Grapes Pears Watermelon Peaches Mango Strawberries Pineapple Plums Naartjies Canned peaches	Apples Bananas Oranges Avocados Pears Mango Watermelon	Apples Bananas Oranges Mango Pears Avocados Grapes Watermelon	Oranges Pears Apples Naartjie Cherries Apricots Strawberries Guava Melon Plums Canned guavas Peaches dried Canned granadilla Pulp	Apples Bananas Avocados Grapes Oranges Pears Watermelon Peaches Strawberries Mango Pineapple Naartjies Plums Melon Paw paw Canned peaches Raisins
Non-alcoholic beverages	Aerated cold drinks Fruit juices Coffee Tea Concentrates and drink powders	Aerated cold drinks Tea Coffee Fruit juices	Aerated cold drinks Tea Coffee Fruit juices	Aerated cold drinks Tea Fruit juices Coffee Concentrates and drink powders	Aerated cold drinks Fruit juices Coffee Tea Concentrates and drink powders

Table 8: *Overall dominant food choices in South Africa according to StatsSA IES 2010/2011 (representing at least 50% of total food expenditure by sub-groups)*

Poorest 30%	Lower middle class	Upper middle class	Wealthiest 20%
Poultry Maize meal Brown bread Sugar Rice Edible oils Beef	Poultry Maize meal Brown bread Rice Beef Sugar White bread Edible oils	Poultry Beef Maize meal Brown bread White bread Rice Full cream milk Aerated cold drinks Sugar Edible oils	Poultry Beef Full cream milk Aerated cold drinks Brown & white bread Boerewors/beef sausage Lamb Baked products Cheese Breakfast cereal Rice Sugar Maize meal Fruit juices Eggs

IN SHORT

THE DYNAMIC SOUTH AFRICAN CONSUMER LANDSCAPE

OVER THE LAST FEW YEARS HAS BEEN CHARACTERISED BY:

- Growing real household income: From 2009 to 2015 average population monthly household income (AMPS data) increased by 62.8% nominally and 19.6% in real terms.
- Class mobility observed among middle class, upper middle class and wealthy segments (+23%, +65% and +32% from 2005 to 2015).
- Gradually increasing urbanisation: Urban population increased by 32% to 65% (AMPS data).
- A relatively youthful, but gradually aging population: Among the adult population in South Africa individuals aged 15 to 34 years represented 49% in 2015, compared to 53% in 2010 (AMPS data).
- High level of unemployment: 24.5% unemployment in fourth quarter of 2015, somewhat lower than the high point of 26.4% in the first quarter of 2015.
- High levels of consumer debt: From 2009 to 2015 the total Rand value of credit granted increased by 140% and the number of active credit accounts by 18.6%.

SOUTH AFRICAN OUTLOOK

Outlook for field crops

SUMMER GRAINS

Following two consecutive record harvests in the US, and generally high grain production levels globally, grain prices have fallen well below the peaks of 2013. By contrast, summer grain prices in South Africa have reached record levels in the midst of a second consecutive drought and sharp currency depreciation.

Global maize situation and trends

Following two consecutive record harvests in the US, and generally high grain production levels globally, grain prices have fallen well below the peaks of 2013. Despite a marginally smaller crop in 2016, supply was sufficient to meet mostly stagnant demand and maintain high stock levels, allowing prices to approach levels last observed in 2010.

Two major grain demand drivers of the past decade, namely biofuel production and Chinese economic growth, are expected to slow significantly during the next decade. Biofuel production is expected to slow due to weaker crude oil prices, whilst the Chinese economy is expected to grow at a slower rate due to domestic credit limitations. Therefore, barring extreme weather conditions and related supply shocks, prices are expected to remain under pressure in 2016 and 2017, before starting a gradual recovery towards 2020, as crop area consolidates and animal feed demand expands steadily. At the same time, the inherently higher cost structure underlying grain production prevents prices from falling below pre-2007 levels (Figure 19).

Domestic summer grain situation and trends

In contrast to the current global reality of high production, high stocks and falling prices, domestic summer grain prices in South Africa have reached record highs in 2016, in the midst of a second consecutive drought. The South African weather service indicates that 2015/16 represented the lowest annual rainfall in South Africa since 1904 – a fact also reflected in the expected summer grain production. The severity of the drought through November and December resulted in a substantial decline of almost 30% in the national area planted to maize (Figure 20). The geographic rainfall distribution however resulted in significant regional differences, with the maize area in the Free State and North West declining by 43% and 32% respectively, compared to a small increase of 4% year on year in Mpumalanga. Given the decrease in planted area combined with the expectation of well below average yields for the 2015/16 crop, the latest indications from the Crop Estimates Committee (CEC) reflect a commercial maize crop of merely 7.16 million tons, a decline of 28% from the already below average 2015 harvest and more than 40% below the 3 year average. The CEC further indicates that the maize area planted by the informal sector has also declined by 33% year on year in 2016 as a result of the poor planting conditions.

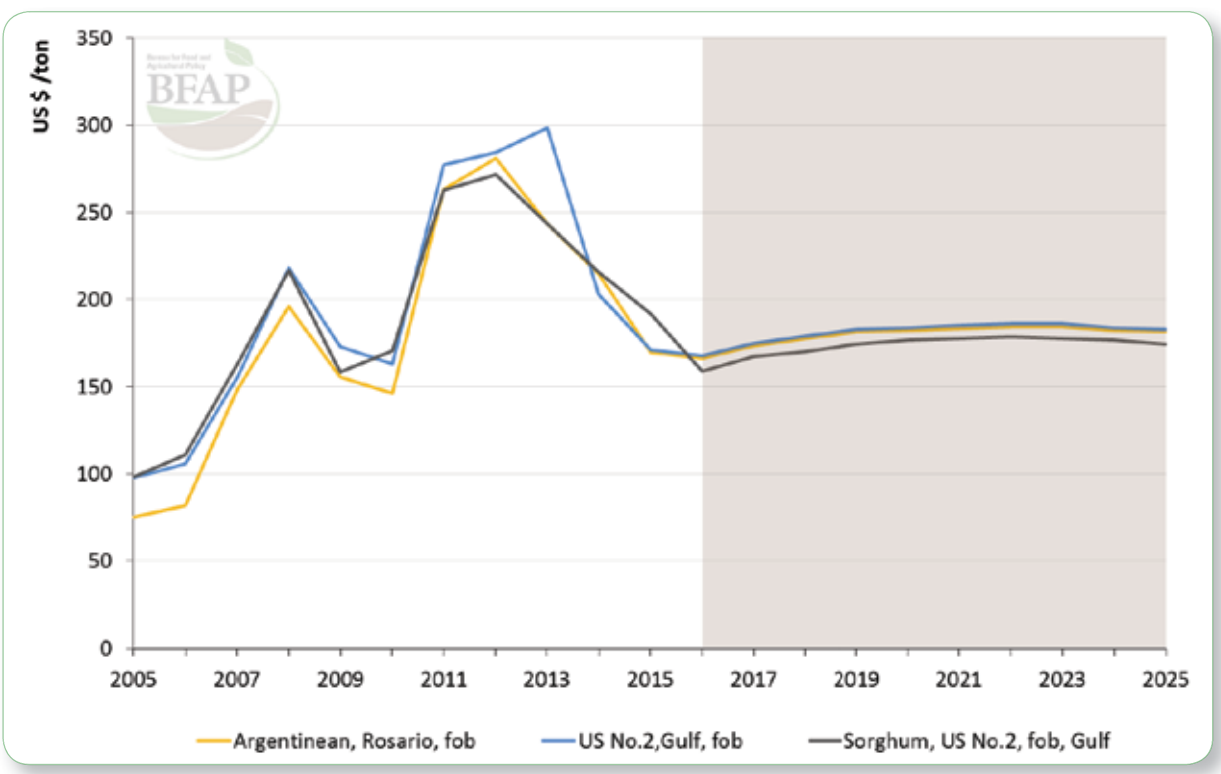


Figure 19: *Yellow maize and sorghum world prices: 2005-2025*
Source: FAPRI & BFAP, 2016

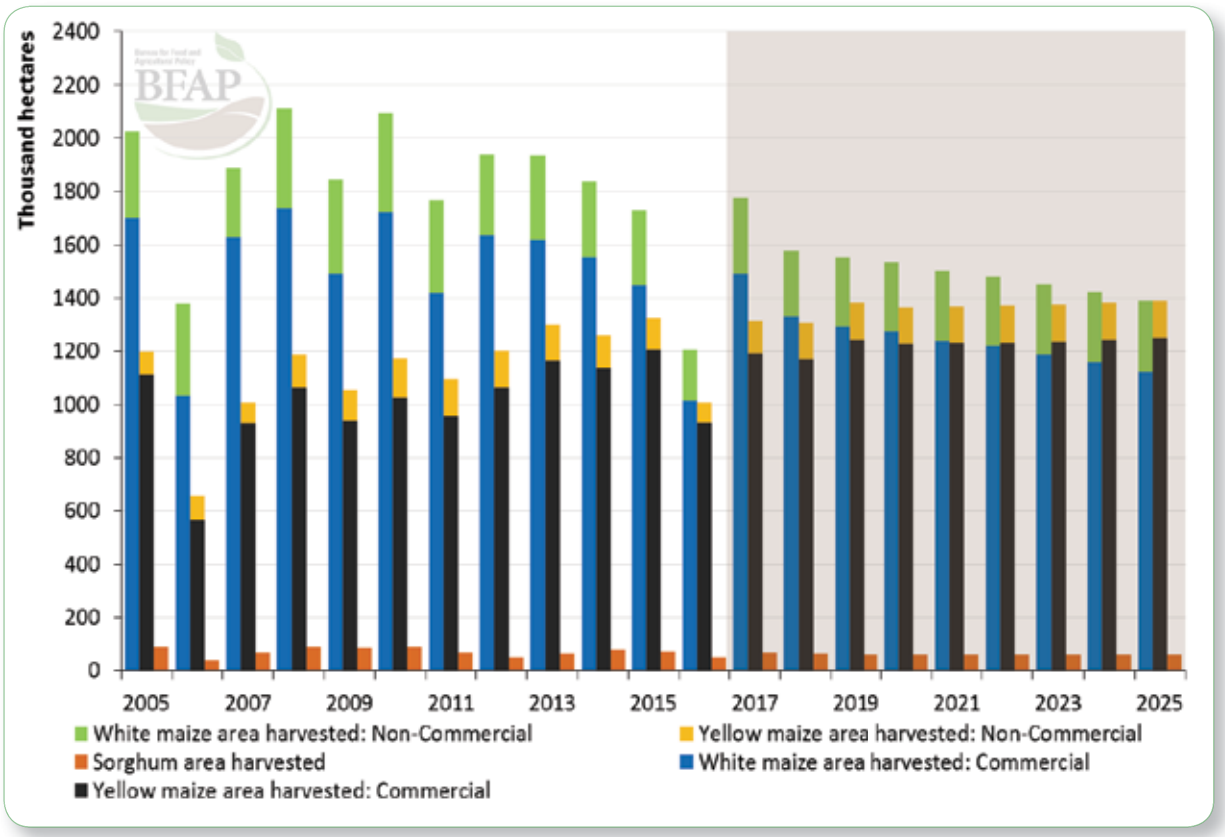


Figure 20: *Summer grain area harvested: 2005-2025*

Given that the exceptional decline in the area cultivated to maize in 2016 was largely a result of the drought as opposed to economic considerations, the outlook reflects a strong recovery in 2017, after which the long term declining trend in total summer crop area, particularly white maize, is expected to resume. Commercial maize area is projected to reach 2.37 million hectares by 2025, from 2.65 million hectares in 2015. Figure 20 indicates that the area planted by the informal sector is also projected to decline marginally, thus total area planted to maize by 2025 equates to 2.78 million hectares, from 3.10 million hectares in 2015. The bulk of this decline is attributed to white maize as producers continue to move into yellow maize and oilseeds in response to rising demand for animal feed. Maize consumption in the animal feed sector is projected to surpass 6.5 million tons by 2025, an expansion of almost 2% per annum over the 10 year period (Figure 21). Demand for maize consumed as food is strong in the short term, as cash strapped consumers switch to the cheapest possible source of starch, but in the medium term, as income growth recovers, maize food demand stagnates due to substitution into alternative starches such as rice and bread. Should the economic recovery be slower than the baseline assumptions, firm short term demand could continue longer.

Whereas commercial white maize area is projected to decline by an annual average of 1.5% over the outlook, commercial yellow maize area is projected to expand by an annual average of 1.4%. Consequently in the commercial sector, yellow maize area is set to exceed white maize area by the end of the outlook period. This shift is further supported by the fact that yellow maize is more frequently traded in the global market, making it easier to balance domestic market surpluses or deficits through trade. In the informal sector, yellow maize area has also expanded significantly over the past decade for the purpose of feeding mainly poultry, but the bulk of production is still for human consumption. This implies the white maize area planted by informal and subsistence producers will likely remain well above the yellow maize area planted by these producers.

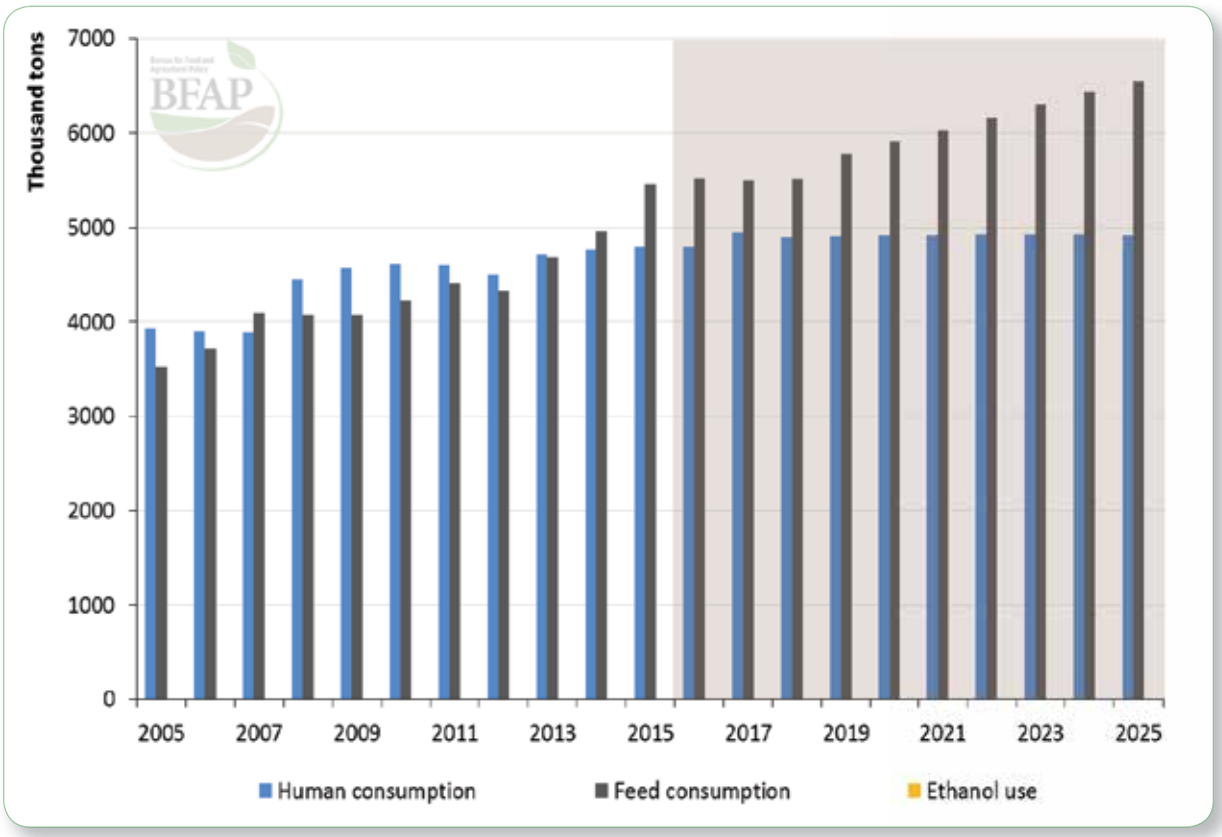


Figure 21: *Maize consumption in South Africa: 2005-2025*

BOX 4.1: Considerations regarding government support to smallholder maize farmers

Small-scale or emerging agriculture in South Africa has received considerable attention from policy makers, and there is a shared perception that revitalisation of this sector may be the impetus needed for poverty reduction, food security and economic growth. Although each provincial government implements various initiatives differently, the Comprehensive Agricultural Support Programme (CASP), Ilima/Letsema and LandCare grants are the three major programmes through which the national government supports the development of smallholder farmers. Figure 22 indicates how the grant amounts, in real terms, have grown over the past decade.

The objectives of these support programmes emphasise development of small scale farmers. CASP aims to ensure the sustainability and commercial viability of emerging farmers and beneficiaries of agrarian reform. Similarly, Ilima/Letsema aims to support sustainable agriculture and promote rural development for smallholder producers while LandCare is in place to address land degradation problems and encourage the sustainable use of natural resources which will lead to increase productivity and increased food security. With a considerable increase in grant amounts transferred, one would expect smallholder agricultural output to exhibit a similar upward trend, but unfortunately the key feature of these support programmes, namely lacking farmer support ex post, has not changed.

Data from DAFF suggests that national smallholder maize production and yields have been rather stagnant over the years. However, using maize production as a single performance measure of benefits received is misleading as maize is not the only commodity produced by emerging farmers. In order to shed light on the return on investment of some of these programmes we take a closer look at the Eastern Cape where a large number of smallholders produce maize mainly to supplement household food consumption.

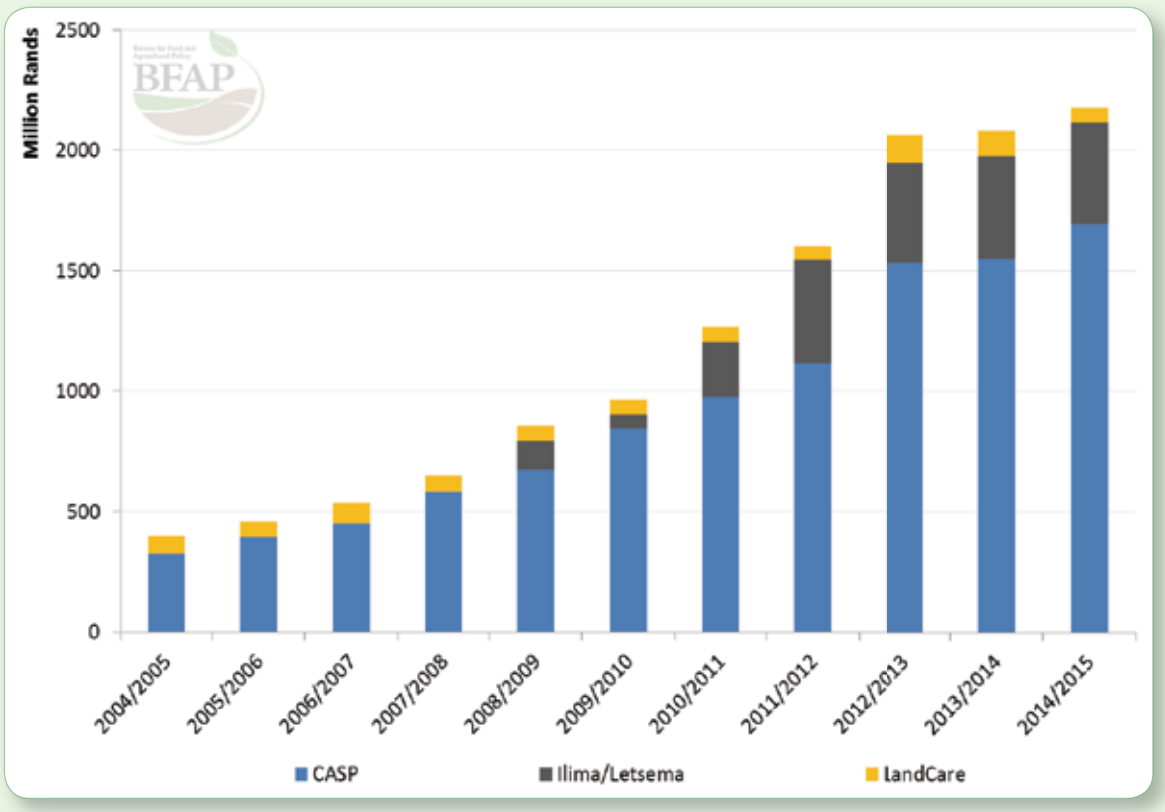


Figure 22: *South African Conditional Grants Transfers*

In line with the national trend, agricultural development support has also increased in the Eastern Cape (Figure 23) and so has maize production; increasing from about 75 thousand tons in 2004 to 400 thousand tons in 2014. Smallholder maize yields in the Eastern Cape have increased steadily, despite less than ideal rainfall conditions during some production years. The increasing yield can mainly be attributed to the application of productivity increasing inputs under the support programmes. However, despite the progress made in terms of yield improvements, yields amongst small scale maize farmers remain low in absolute terms with an average yield of 1.9t/ha reported in 2014/2015. In fact the yields are so low that more often than not, the return on maize production is negative from a purely financial perspectice. In order to illustrate this we consider the 2013/14 season of the Ilima / Letsema Eastern Cape grants.

The Department of Rural Development and Agrarian Reform appointed the Eastern Cape Rural Development Agency (ECRDA) to facilitate and implement a cropping programme where farmers are subsidised per hectare of maize planted. According to the 2013/2014 ECRDA annual report, R38 million in production costs were spent to subsidize 6559 hectares of maize planted. Government contributed R5 800 per hectare through inputs such as seed, fertiliser, insecticides and herbicides while farmers contributed R1 800 per hectare mainly for mechanisation and labour costs. The total input cost per hectare thus amounted to R7 600. At an average yield of 1.75t/ha and the 2013/14 average maize price of R2 322/ton, it means that maize to the value of R4 064 per hectare was produced against a total input cost of R7 600 per hectare.

The benefit to the farmer was significant as an investment of R1 800 per hectare yields R4 064 worth of maize, yet the expense to Government amounted to R5 800 per hectare, in order to subsidise the smallholder farmer by R2 264 per hectare. While one can argue that the R1 800 contributed by the farmer that went towards labour and some contracting work was reinvested in the local economy resulting in economic stimulation, the bulk of the Government's funds went towards fertiliser, seed and chemicals sourced from companies outside the region.

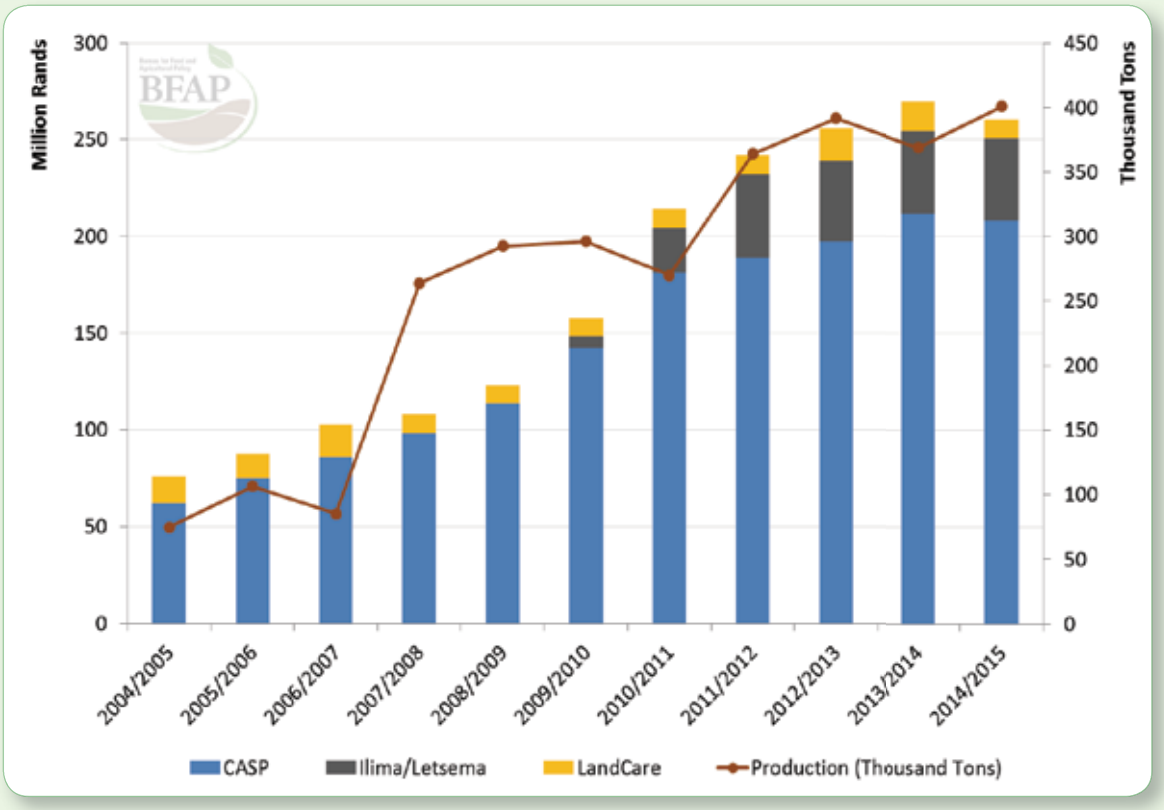


Figure 23: *Eastern Cape Grants and Maize Production*

This hardly seems like an efficient utilisation of scarce Government funding, and unfortunately these types of support programmes are more the rule than the exception. At higher yield levels (closer to 3.5 and 4 tons/ha) these programmes can be more beneficial, but the prevailing low yield levels, despite expensive modern inputs, raise questions surrounding the support services, climate and crop / soil suitability. These programmes have to a large extent created grant dependant farmers who benefit from the programmes despite low yields as their own contribution is minimal.

It seems to be an appropriate time to reconsider these programmes and how they should function to ensure maximum benefit to the producers whilst ensuring maximum efficiency in utilising government funds to stimulate economic development and growth.

With the South African white maize area having declined by almost 40% in 2015, commercial white maize production is set to reach a 20 year low in 2016 and the CEC are expecting a mere 3.07 million tons. The decline of 35% from the already reduced 2015 crop reflects the severity of the drought in mainly the Western parts of South Africa, which produce proportionally more white maize relative to the Eastern parts and irrigation regions. Consequently, South Africa is expected to import almost 1 million tons of white maize. Current price levels reflect concern related to availability, not only in South Africa but also the global market given the limited exportable white maize produced globally. Mexico and the United States have been identified as potential sources of white maize, and some shipments of non GM white maize have already arrived. However US imports of GM white maize are currently not an option due to certification issues, leaving Mexico as the most likely alternative. Mexico is however not traditionally a surplus producer and quotes indicate that FOB prices for Mexican white maize are trading in the region of $250, compared to yellow maize from the US or Argentina at $170-$180 FOB. The South African Grain Laboratories (SAGL) have tested Mexican white maize as Grade No 2, which can be milled in South Africa, but implying a lower extraction rate and a consequent premium for domestically produced maize. The extent to which Mexico will be able to supply the entire import requirement remains uncertain and while Mexico is able to import from the US to increase its own domestic surplus, South Africa may still be required to look elsewhere towards the end of the season in terms of white maize imports.

In addition to availability concerns on white maize which pushed prices to record levels in 2016 (Figure 24), prices also reflect the substantial depreciation of the exchange rate which has driven import parity prices significantly higher. In light of the price premium for Mexican white maize above Argentinian yellow maize in the global market, the domestic price of white maize is also expected to remain almost 40% above the yellow maize price, resulting in all available stocks being consumed as food and almost no white maize used as animal feed. White maize remains the most affordable food staple and demand is therefore very inelastic. Hence while prices are expected on average to trade 57% higher year on year, consumption is expected to decline only marginally in 2016. Following an expected production recovery from 2017 onwards based on an assumption of normal weather, consumption is expected to remain fairly stagnant on a per capita basis over the next decade due to the inelastic nature of white maize demand.

Supplementary to its own domestic requirement, South Africa has always been a reliable supplier of white maize to the rest of the Southern African region. Traditional export destinations include Mozambique, Zimbabwe, Namibia and Botswana (Figure 25). However, these countries have also been affected severely by the drought. While Zambia should be able to export some maize to the region, Zambian stocks remain insufficient to meet the entire regional requirement, hence South Africa is still expected to export more than 450 thousand tons to the rest of Southern Africa during 2016.

For those producers who were able to get their maize planted and achieve a yield in spite of the drought, the price response has been sufficient to ensure a year on year increase in gross revenue for white maize in 2016. This is expected to encourage a significant increase in area planted in 2017. Combined with a return to trend yields, white maize production could more than double in 2017. This implies sufficient production to replenish stocks and allow an exportable surplus. Should this happen, prices will fall closer to export parity levels in 2017. Assuming stable weather conditions in the medium term, South Africa is projected to remain a surplus producer and hence exporter of white maize mainly to the rest of the Southern African region.

Despite returning to an export status in 2017, the surplus is unlikely to be sufficient to maintain prices at export parity levels throughout a normal export year. This is due to the fact that production available for exports will decline over time due to

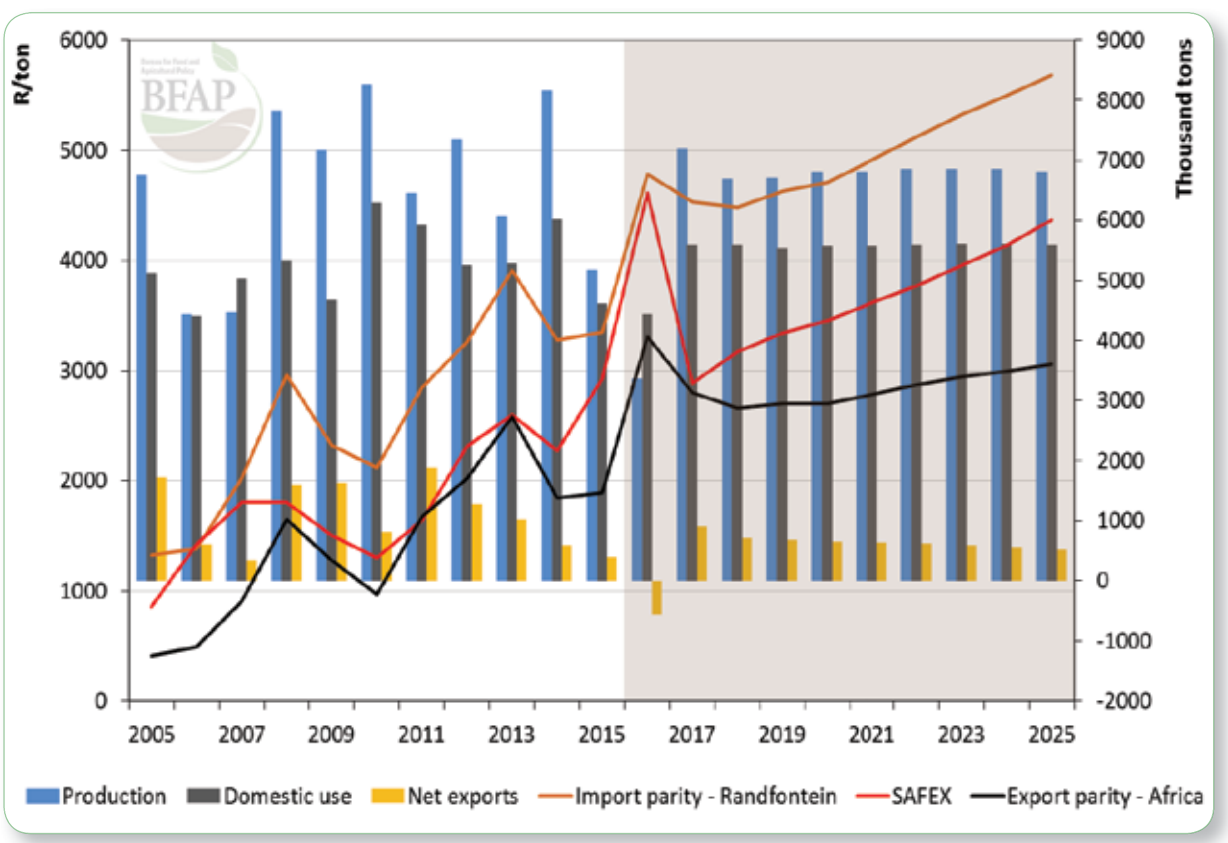


Figure 24: *White maize production, domestic use, net trade and prices: 2005-2025*

the planted area continuing to decline. Therefore, on average, white maize prices are expected to trade slightly above export parity, but with variability away from export parity from month to month caused by domestic supply and demand fluctuations. The bulk of exports will continue to be destined for the rest of the Southern African region, where South Africa is considered the price leader since little trade occurs from outside the region. However, going forward, South Africa can expect to face increasing competition from Zambian exports of non-GM white maize. This is likely to further support the domestic shift from white maize to yellow maize production.

For producers that were unable to plant the intended area or achieve yield due to the drought, the financial impact is significantly worse, as reflected in the financial position of the BFAP prototype farm in the Western Free State. The region received very little rainfall during the optimal planting period ranging from 20 November to the end of December 2015, preventing producers from planting their crop. Moderate rainfall towards the second week of January 2016 allowed some producers to plant limited maize area. Traditionally the Western Free State prototype farm cultivates 950 hectares of maize. However, for the 2015/16 production season the planted area was limited to a mere 50% of a normal season. In the farm simulation model for this specific farm, yield and farm gate prices were adjusted to account for drought conditions. Figure 26 illustrates the return on investment (ROI) from 2013 to 2019, reflecting actual data from 2013 to 2015 and projections from 2016 to 2019.

The 2014/15 production season was already a challenging year given low precipitation levels, which resulted in reduced yields and consequently a negative ROI. Due to the continued drought, the ROI in 2016 will be even more negative (-3.1%). Comparing the ROI for this specific farm to the consumer price index (CPI) suggests that inflation has outperformed the producers return substantially in 2013, 2015 and 2016, whereas in 2017, growth in real terms is fairly stagnant. Then again, during 2014 the ROI beat the CPI, which is again projected to happen in 2018 and 2019.

One of the greatest challenges for drought affected farmers is the ability to restore a farm's cash flow position to ensure a positive cash balance at the end of a year. To emphasise the challenge, a stochastic simulation was conducted in order to allow for variability on key output variables such as yield, price

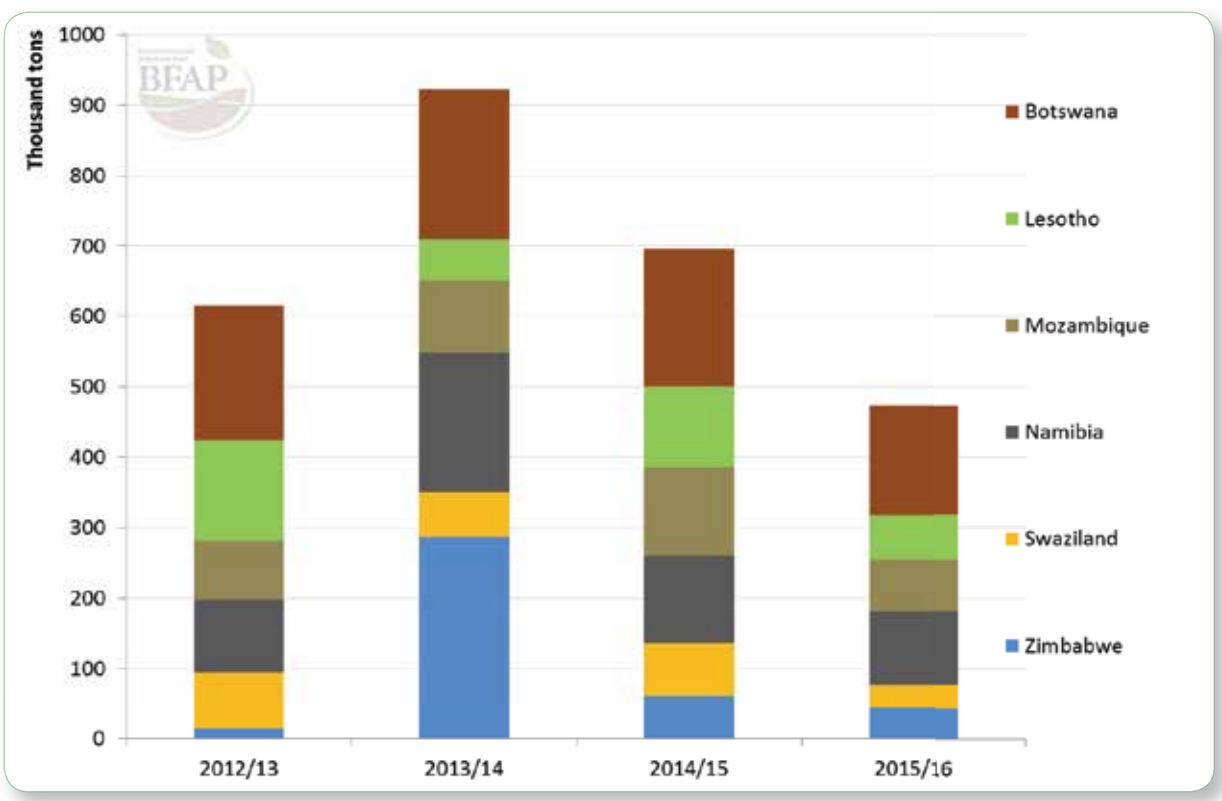


Figure 25: *White maize exports to neighbouring countries*

Figure 26: *Western Free State prototype farm: Return on investment compared to CPI (2013-2019)*

and input costs. Figure 27 summarises the model results of 500 iterations which illustrates the mean simulated maize gross margin (secondary axis) and respective recovery of net cash position (primary axis). The simulation indicates that if maize area for this specific farm is restored to normal in the 2016/17 season, the cash position of the farm will only turn positive in 2018, given that the maize gross margin exceeds R5500/ha from 2017 onwards. It is important to note that the projection indicates the recovery under normal conditions, hence yield and price returns to an equilibrium level based on normalised weather conditions.

To illustrate the effect of risk as opposed to the average outcome as per Figure 27, the simulation results of the 500 iterations under different yield, price and cost combinations can be illustrated as a stoplight chart which highlights the probability of generating a positive cash position given historic variation around the average market price, yield and cost projections (Figure 28). The stoplight chart in Figure 28 indicates that the 500 possible outcomes in 2017 yielded only a 42% probability that a positive cash position will be generated. Towards the end of 2018 season the probability of generating a positive cash position increases, however, there still exists a 32% chance that the cash position will remain negative during 2018.

Apart from the recovery phase, it is essential for producers to ensure long term financial sustainability by means of growth in real terms, hence growth in net worth of business beating inflation. Exchange rate depreciation offsets some of the impact of lower global commodity prices, yet it also induces a firm increasing trend in input expenditure, suggesting that long term real financial growth of a farm business might be a challenging task. Financial growth that exceeds inflation is essential for

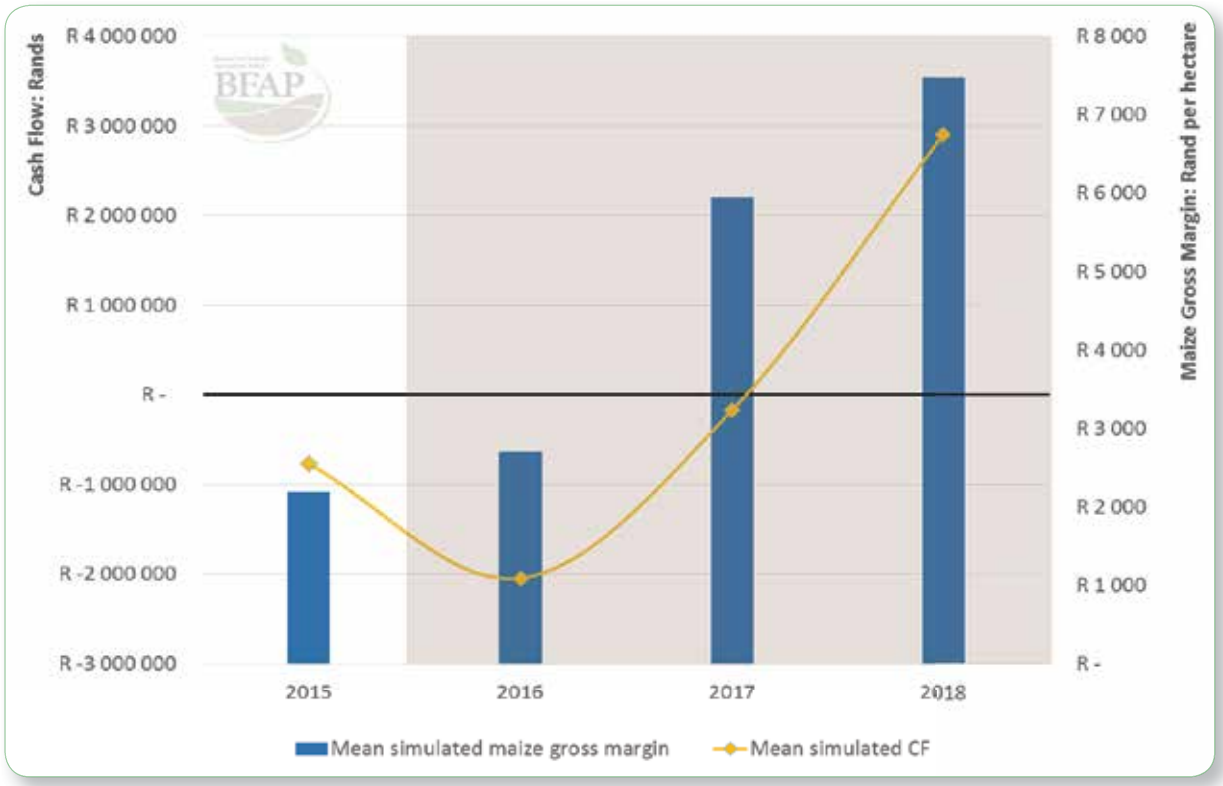


Figure 27: *Western Free State prototype farm: Recovery after drought in 2015 & 2016*

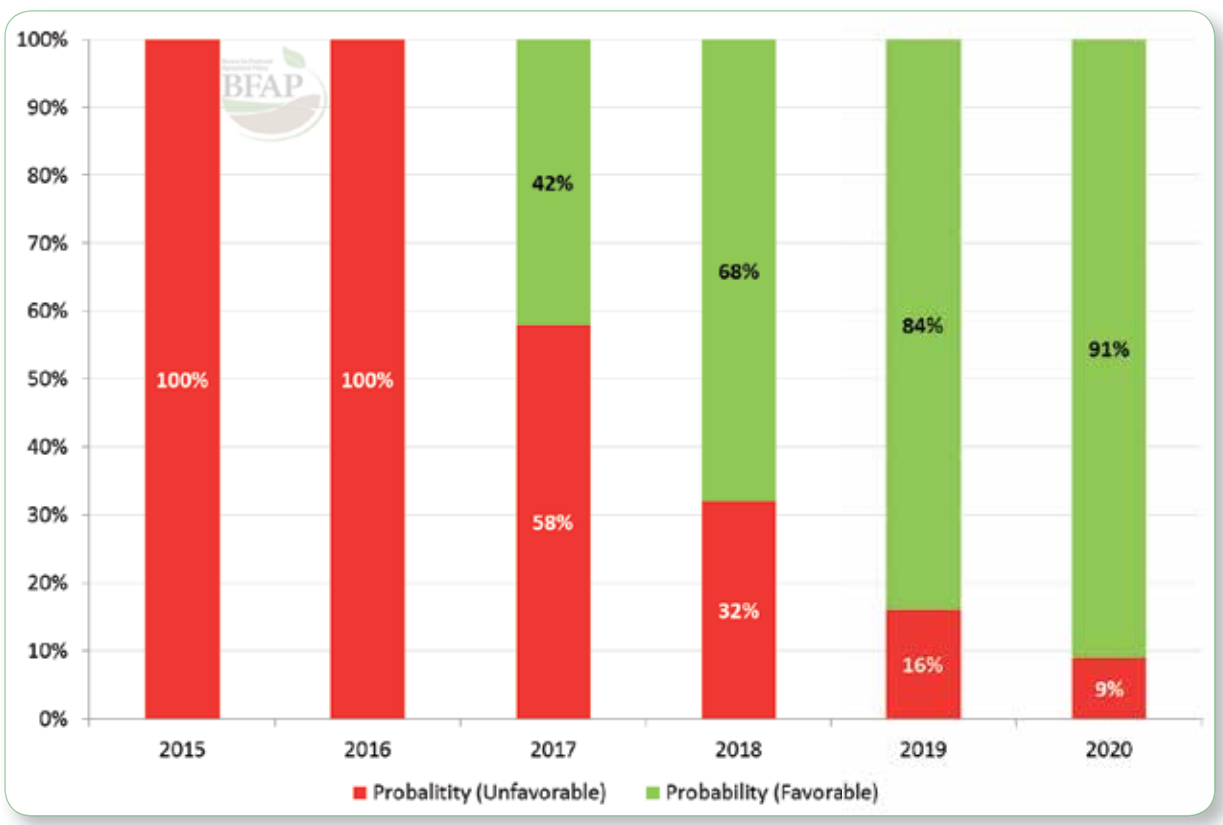


Figure 28: *Stoplight chart: Probability of generating a positive cash flow on the Western Free State prototype farm : 2015-2025*

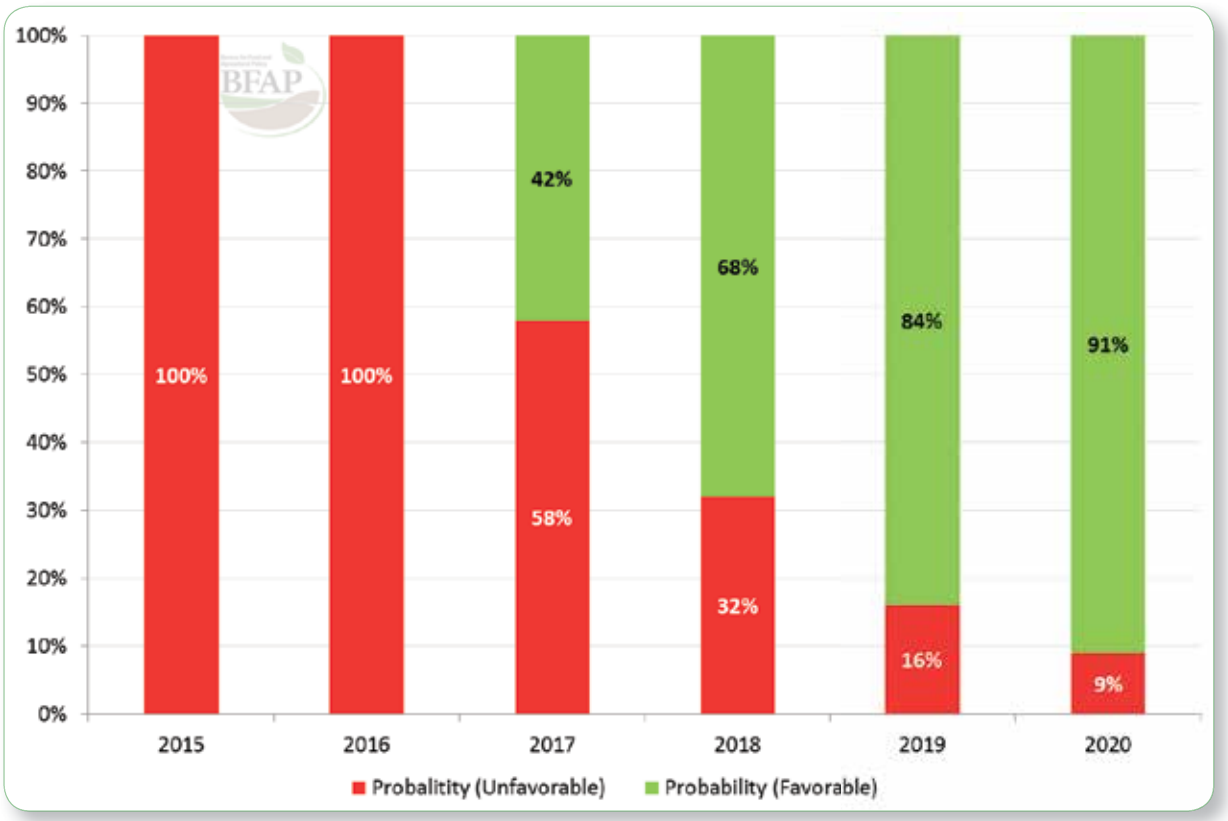


Figure 29: *Stoplight chart: Probability of ROI exceeding CPI food inflation on the Western Free State prototype farm (2015-2022)*

the sustainability of any business and hence the simulated ROI of the Western Free State prototype farm was measured against CPI over the period from 2015 to 2020. The probability that the farm's annual ROI will exceed inflation is illustrated by the stoplight chart in Figure 29. The graph suggests a rather divided view on the ability to show positive growth in 2017, when the probability of generating a return exceeding inflation is only 49%. Towards the end of the projection period however, the probability is in favour of a ROI exceeding annual inflation which essentially entails that financial growth is possible in real terms. Increasing yields through more productive and effective practises and improved utilisation of inputs will be essential to ensure real financial growth in the long term.

BOX 4.2: Impact of the 2015/16 drought – ensuring recovery

The impact of the 2015/16 drought, the worst in South Africa since 1904, has been far ranging, for producers and consumers alike. It has however not been the sole cause of higher food prices, as the sharp depreciation of the exchange rate over the past year has caused import parity prices to soar. Consequently by January 2016, the cost of a staple basket has increased by approximately 19% year on year and a further 10% was expected for the remainder of the first quarter of 2016. At the end of March it was however evident that this further increase was slightly less at just below 9%. This was largely driven by average bread prices in March being lower than March projections generated in the beginning of 2016. The remainder of 2016 is expected to have sustained high prices but could tend substantially lower if there is a favourable supply response in cereal and grain production in the upcoming production season.

From a farm business perspective the current drought will not only affect the current production season, but will also have financial and debt implications for farm businesses in the foreseeable future. Furthermore, poor rural households continue to be dependent on household agricultural production. More than 1.2 million individuals will be affected by the current drought, which has had a significant impact on maize yields, giving rise to food insecurity. Hence, supporting the primary agricultural

sector to overcome the short term effects is critical to ensure that long-term agricultural production, growth and food security is not compromised.

Agriculture has been identified as a sector to expand in the National Development Plan. Ambitious job creation targets will require investment in irrigation infrastructure and consequently, the response to the current drought must continue to foster an enabling environment where investment can flourish. In the longer term, it is a return to surplus production that will be most effective in reducing the cost of food staples and curbing food price inflation. Thus, achieving favourable food price inflation will depend on a vibrant and sustainable agricultural sector and hence the short term response to the severity of the current drought should prioritise the ability of producers to stay in business, enabling them to contribute to the recovery when weather conditions improve.

A number of actions can be taken to mitigate the short term impacts of the drought for consumers and producers. As South Africa is normally an exporter of maize, the total import requirement expected in 2016 is unprecedented. To ensure that imports occur timeously and efficiently, the public and private sector formed the Grain Logistics Coordination Committee in January 2016. Further actions that can be considered for the benefit of consumer include:

- Concessions to allow GM white maize imports from the US
- "Operation Food", similar to the successful Operation Hydrate
    - o Retailers, civilians and businesses drop contributions at selected points in rural and urban areas
    - o Selected relief agencies / NGO's / Religious organisations responsible for redistribution of contributions on a daily basis

As a result of climatic risks, international re-insurance companies are considering part withdrawal and restructuring of South African agricultural insurance. This would have a detrimental impact on future growth and broad based development of agriculture in South Africa. As mitigation, government could provide an agricultural insurance guarantee of last resort to re-insurance companies, ensuring cost-effective availability of crop insurance.

Recovery will be dependent on sound decision making, which needs to be underpinned by timely and accurate information. Dissemination of information can be improved by the establishment of a drought early warning system, which reports monthly on seed sales, planting progress, crop estimates via the CEC, household food consumption per district, dam levels and water availability in rivers, infrastructure conditions and the utilisation of key infrastructure such as ports, railways and water canals. To enable such an early warning system, the development of a spatial household food monitoring system will be required, implying investment in state of the art technology and systems that enable the CEC to monitor planting progress, water availability and infrastructural conditions.

Whilst the current drought is particularly severe, the agricultural sector has demonstrated its resilience in the past and with well informed, timely reactions, it will recover. In the long term, the sector still has the ability to generate jobs and contribute to sustained economic growth in South Africa.

Having illustrated the projected recovery from the current drought in the white maize producing regions such as in the Western Free State, it is important to note that the extent of the drought's impact differs across regions. In predominantly white maize producing regions such as the Northern Free State and North West province, results would be similar. The effect may be less severe in other regions where rainfall was more consistent, but the reality is that South Africa's entire dry land maize producing region will be affected to some degree in 2016, as illustrated by the white- and yellow maize yield trends in Figure 30. The blue bars illustrate actual yields obtained in the prototype farm regions until 2015, whereas the grey bars indicate the CEC estimate for 2016. In turn the yellow bars reflect the average over the entire period, within each region. The green and red dotted lines reflect the national average expectation of the CEC in 2015 and 2016 respectively. It is noteworthy that since 2015, yields have declined in all dry land prototype farms.

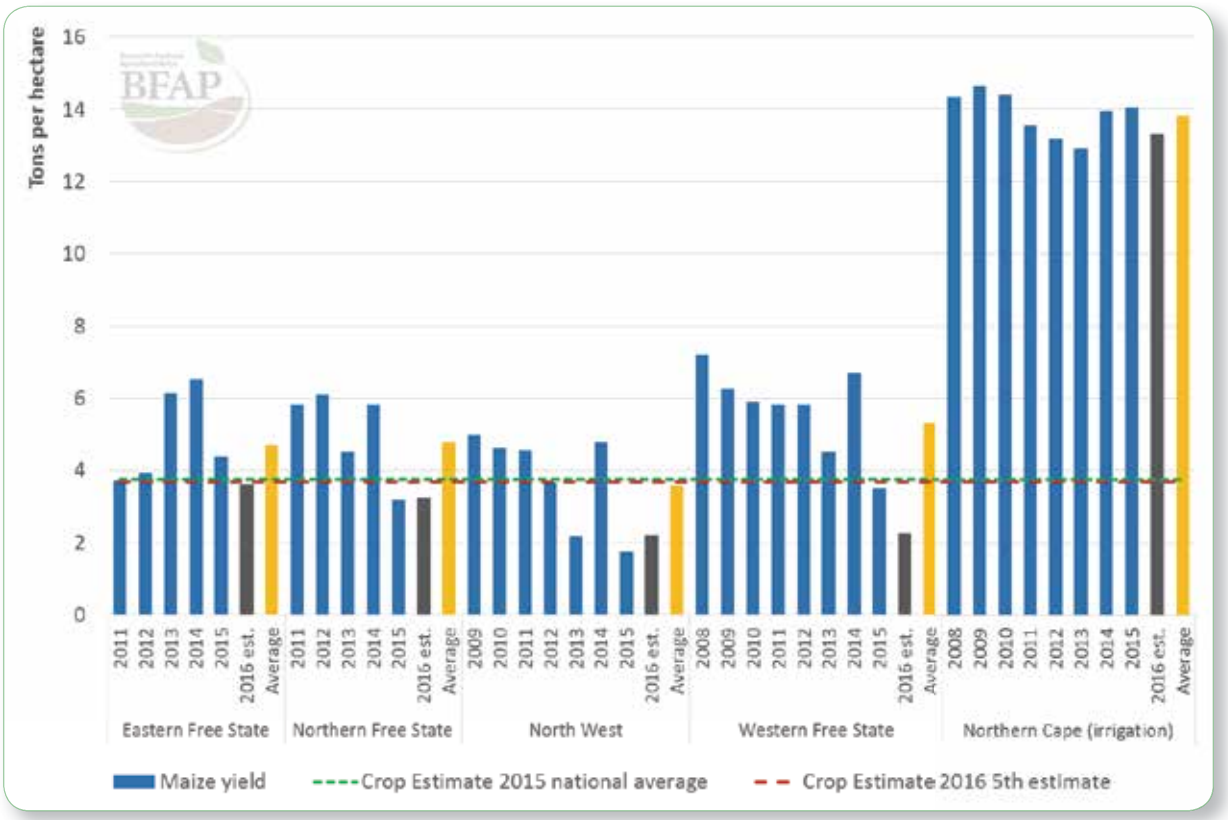


Figure 30: *BFAP prototype farms: White- and yellow maize yield trends & Crop Estimates Committee's averages*
Source: BFAP & CEC, 2016

Whilst less severe than in the white maize production regions the impact of the drought is still evident in the 24% decline in yellow maize production levels in 2016. This represents the second consecutive decline, having already been reduced by almost 20% in the 2015 season. Consequently, imports of just over 2.4 million tons of yellow maize are expected, pushing prices to import parity levels (Figure 31). As a consequence of yellow maize being more freely available in the global market, where stocks are high and prices low, the expected price levels remain well below white maize prices. In addition to the movement towards import parity, the 24% year on year price increase in 2016 reflects currency depreciation. Prices will remain sensitive to currency fluctuations for the rest of the season until increased supplies induce a movement away from import parity levels.

Despite the prevailing premium of more than R1000 per ton for white maize, the higher yellow maize yield provides a more favourable gross return. The commercial yellow maize area planted in 2016 is therefore projected to expand by almost 28%. Combined with a return to trend yields, the resulting harvest of almost 6.8 million tons in 2017 represents an increase of 65% year on year, implying a 25% increase above the 3 year average (which included to dry years). Assuming stable weather, South Africa is projected to return to a net exporting position in the medium term, but exports are not expected to reach the levels of 2013 and 2014 as a result of firm domestic demand growth (Figure 31). By implication, prices shift downwards and are expected to trade closer to export parity levels. However, given smaller export volumes, prices are only expected to trade at export parity for a short period of time during an export year. The generally weaker exchange rate assumed over the outlook period also supports export parity prices well above recent norms. Smaller volumes of imports are still expected into the coastal regions, particularly the Western Cape which faces a significant transport differential from key inland maize production regions. The return to a surplus position however also implies that South Africa will need to remain competitive in the global market, where prices have stabilised at a much lower level. The depreciating exchange rate does provide some buffer from low international prices, however it also increases the cost of production and therefore affects South African producer's ability to remain profitable and competitive in a global context.

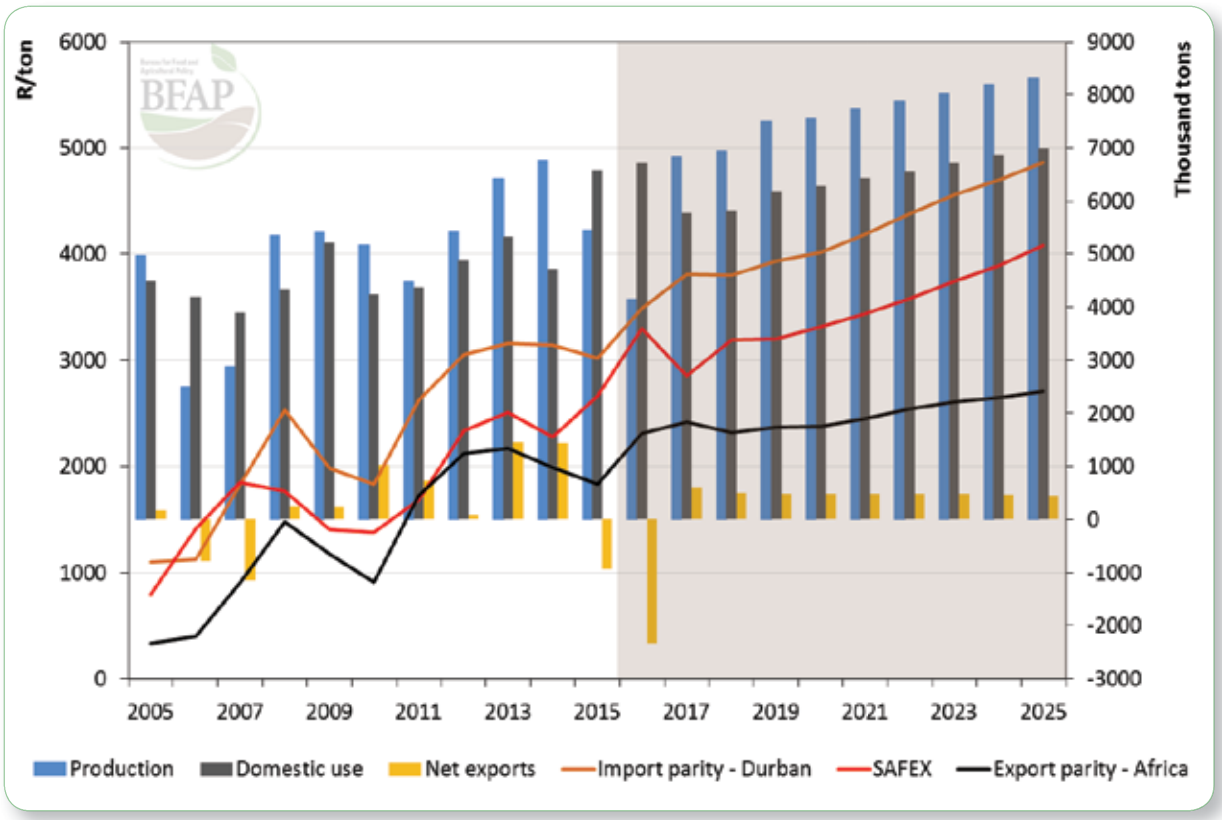


Figure 31: *Yellow maize production, domestic use, net trade and prices*

As a first indication of competitiveness, Figure 32 illustrates maize yields obtained across the globe, since it ultimately determines the cost of producing a ton of maize. The South African average dryland maize yield is lower relative to key international counterparts such as Argentina and the United States of America (USA) due to a number of factors where climatic conditions and natural resource restrictions play a key role.

Figure 32 illustrates that dry land maize yields in South Africa (green line) are substantially lower when compared to the international sample average of 8 t/ha (red line). The lower yield on the South African prototype farms increases the direct cost of producing a ton of grain (Figure 33). For the South African dry land prototype farms, an average of US$99 is spent to produce a ton of maize, well above the international average cost of US$84 per ton maize produced. Furthermore, the average cost per ton maize produced on Argentinian farms only amounts to US$63. The cost comparison against key international producers suggests that South African prototype farms are not cost competitive on a per ton basis, but this does not suggest that production won't continue, because despite higher costs of production and a number of consecutive dry years, margins remain positive (Figure 34), although still below the international sample of US$646 per hectare (excluding France). Compared to countries such as Argentina and Brazil, gross margins on the majority of South African dry land farms in fact performed better.

Production cost considerations will however remain important in the future as it relates to South African producers' ability to compete, both domestically and internationally. It is therefore crucial that producers strive to remain as productive and effective as possible, especially in an environment where domestic maize prices could shift closer to export parity thereby pressuring margins. This is especially relevant for high input cost producers who require a high breakeven price.

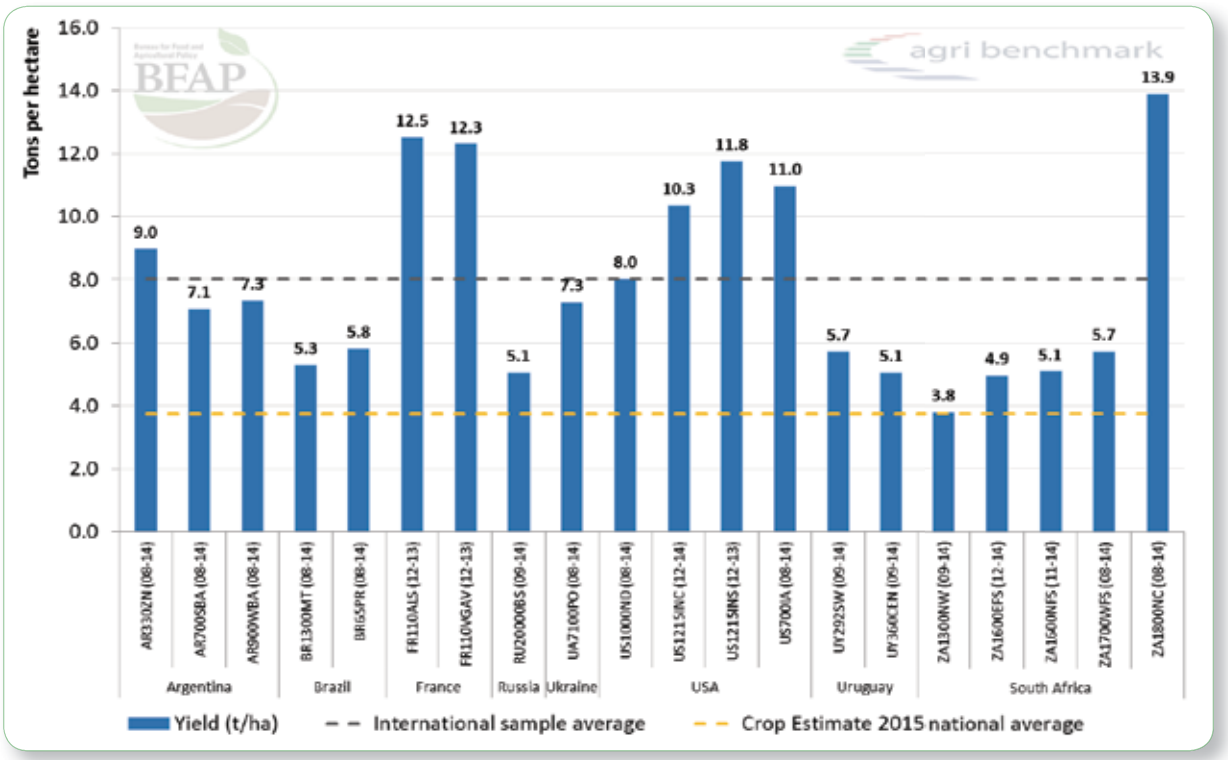


Figure 32: *International maize yield comparison*

Source: agri benchmark & CEC, 2016

**Average yields presented in the figure are based on the number of years the respective farms were included in the agri benchmark network. The years are stipulated in brackets next to the farm size and region where farm is located e.g. (08-14) implies average yield for the period 2008 to 2014.*

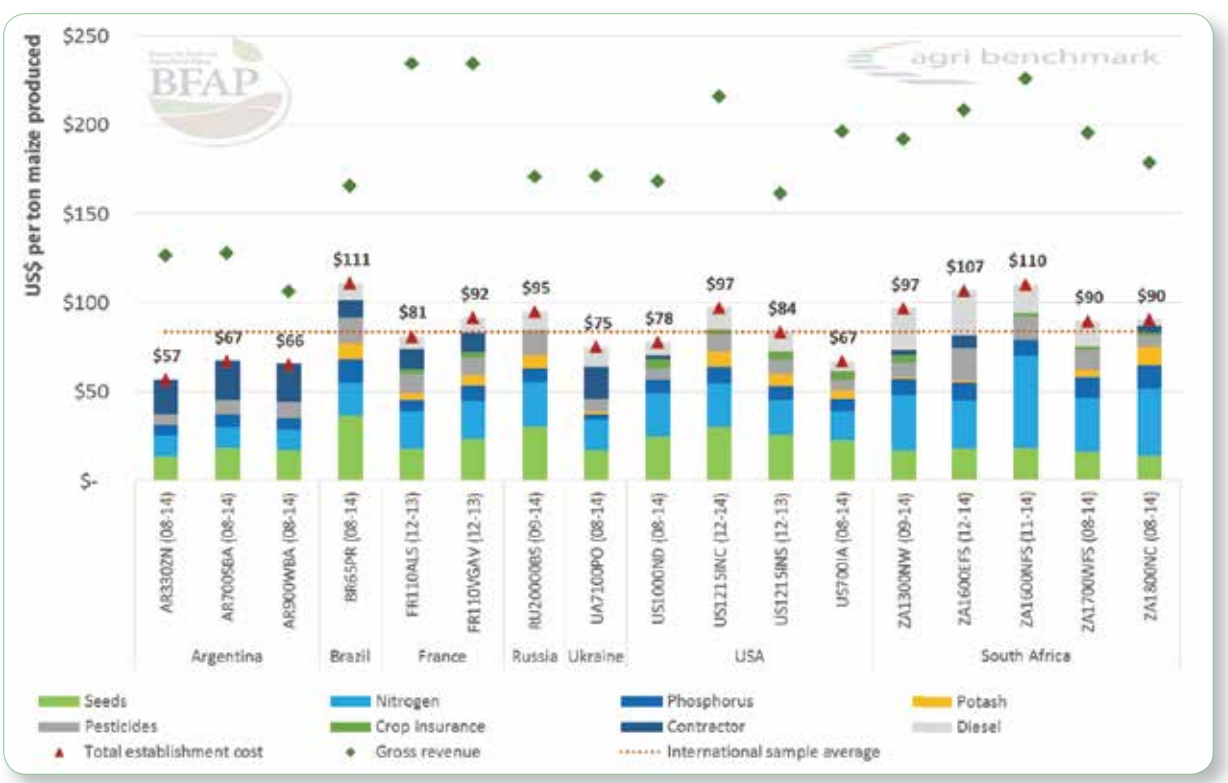


Figure 33: *International comparison of direct maize production costs*

Source: agri benchmark, 2016

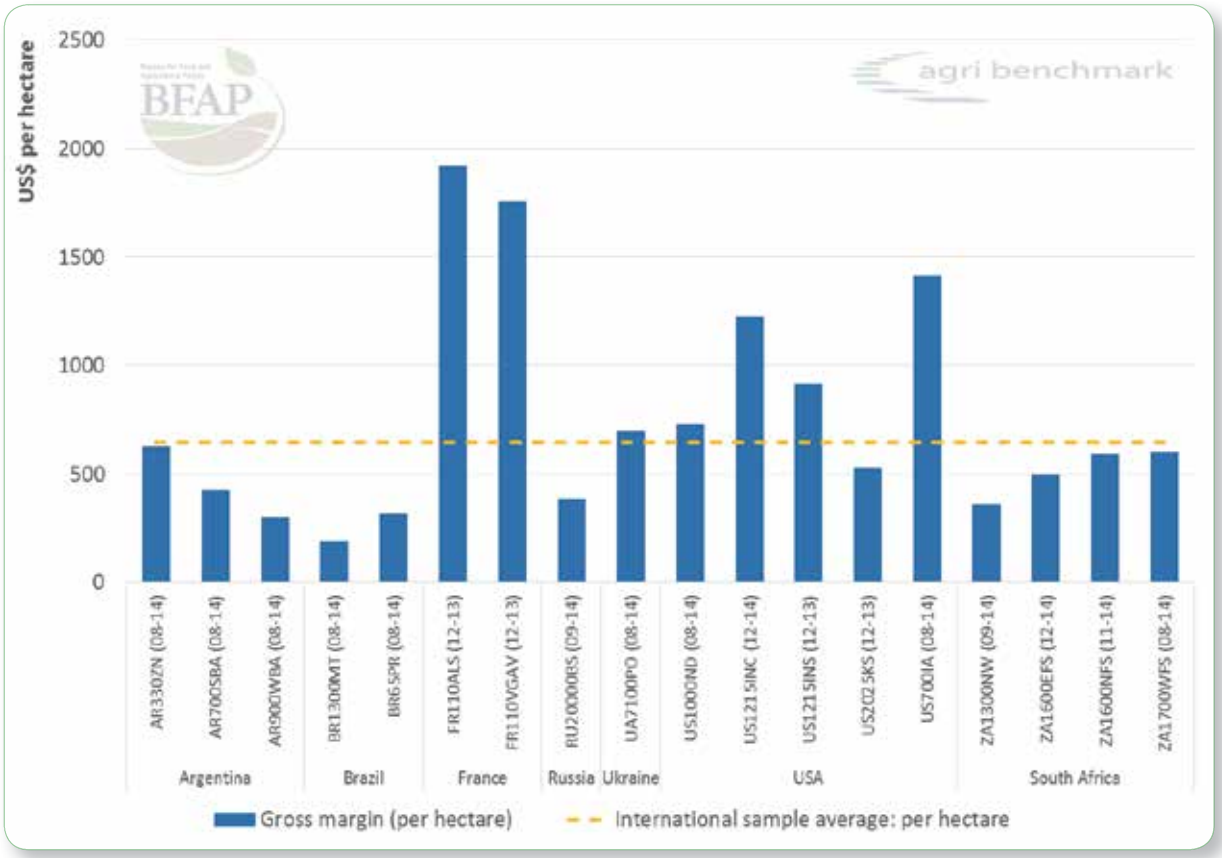


Figure 34: *International gross margin comparison for maize*
Source: agri benchmark, 2016

Domestic sorghum situation and trends

Having peaked in the mid-eighties at more than 300 thousand hectares, sorghum has lost significant hectares to maize production over the past decade. Since 2010 the average area planted to sorghum has declined to a mere 65 thousand hectares. The most important reason for losing hectares is that sorghum yields have failed to increase at the same rate as mainly yellow maize yields, resulting in less competitive gross margins per hectare. This gap continues to widen and whereas sorghum yields have remained fairly stagnant over the past decade, yellow maize yields have increased by an annual average of more than 2%, benefitting from an increasing share of irrigated production and GM plant technology.

Sorghum demand remains inelastic and prices have been exceptionally volatile, switching often between import and export parity levels based on the size of the domestic crop. Trading at import parity levels from 2012 to 2014, sorghum prices traded at a significant premium to maize, supporting an expansion in area from 50 thousand to 80 thousand hectares, providing sufficient stocks to supply the deficit in 2015 when drought conditions reduced production. This will not be the case in 2016 however, as the combined effect of reduced area and disappointing yields result in an expected year on year decline of more than 25% in sorghum production. Thus, more than 50 thousand tons of imports will be required to supply domestic demand of just over 200 thousand tons (Figure 35).

Over the course of the next decade, demand for sorghum remains fairly stable, increasing by less than 1% per annum as a result of population growth rather than rising per capita consumption. Area is projected to consolidate at approximately 60 thousand hectares, with production expansion arising from yield growth rather than any large scale area expansion. The market will remain finely balanced and from 2018 onwards,

limited trade is projected under stable weather conditions, with prices maintaining a premium over maize. Given inelastic demand and a finely balanced market, any weather induced supply shocks will likely result in continued price volatility. Sorghum has been considered as a possible feedstock for bio-ethanol production, which could induce a shift in demand, impacting production and trade volumes.

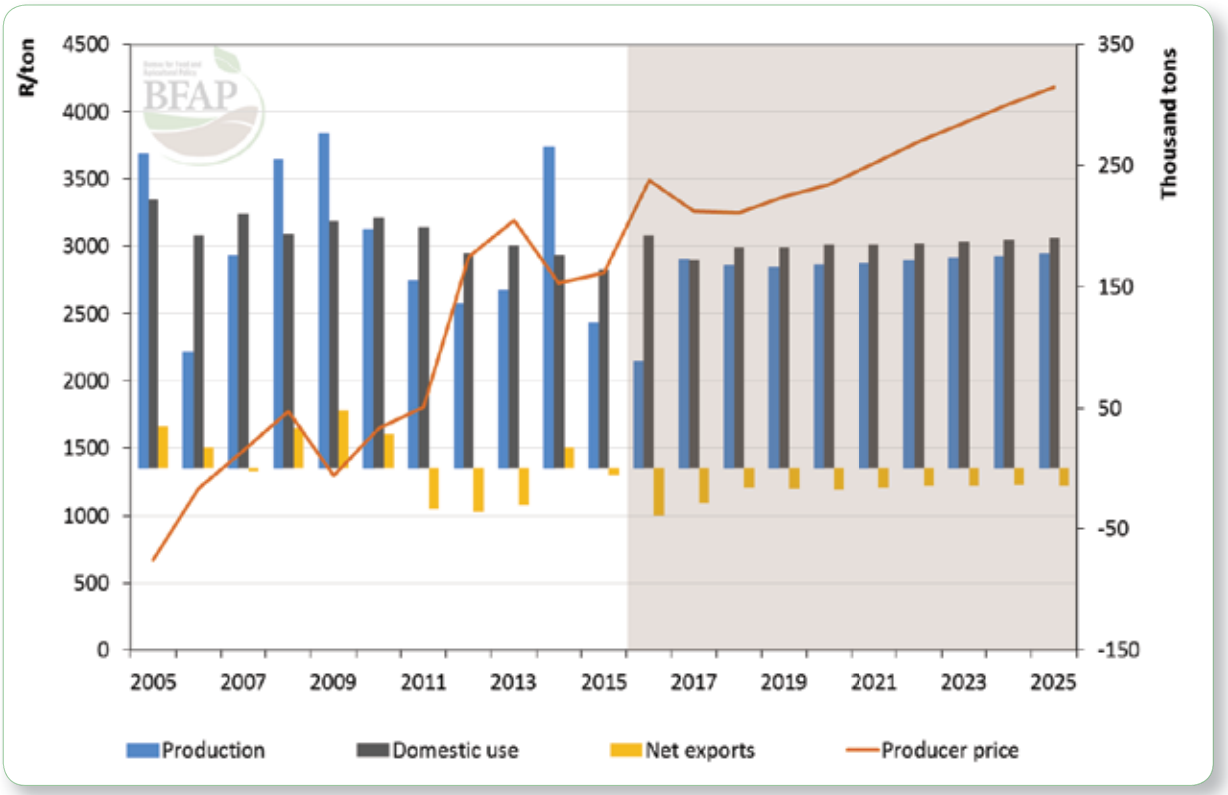


Figure 35: *Sorghum production, domestic use, net trade and prices: 2005-2025*

SOUTH AFRICAN OUTLOOK

Outlook for field crops

WINTER GRAINS

The impact of the drought has been much less severe on wheat prices given that South Africa typically trades at import parity in a normal year. Despite falling world prices, South African prices remain well supported by the combination of weaker exchange rate and the variable import tariff triggered when the price of US Hard Red Winter wheat drops below $294.

Global cereal situation and trends

Global wheat markets have been characterised by abundant supply and stagnant demand in recent years, causing rising stock levels, with prices trending generally downwards since the end of 2012. 2015 produced an all-time record harvest and initial projections indicate that the 2016 crop will be only marginally smaller following favourable spring growing conditions in key exporting regions such as Russia, Ukraine and the European Union. Despite slightly higher consumption projected in 2016, stock levels are set to rise to record levels and the stocks to usage ratio is expected to increase for the fourth consecutive year. Unsurprisingly, prices have declined further, with the price of USA Hard Red Winter wheat dropping below $200 per ton in May 2016. The price is projected to bottom out in 2017, as production consolidates and demand recovers from 2018 onwards (Figure 36).

Global barley production also increased by 3% year on year in 2015, providing a global crop 9% above the 5 year average. Thus despite fairly stable demand, prices continue to decline and the price of malting barley in 2015 fell to a level last observed in 2006. Prices are projected to decline further in 2016 on the expectation of another above average crop and fairly stable malting demand expectations, which result in the fourth consecutive increase in stock levels. Area is expected to decline however and as it consolidates over the outlook, barley prices are projected to stabilise marginally above wheat prices. In light of the competition for hectares, the barley price path follows a similar trend to wheat over the 10 year projection period (Figure 36).

Domestic winter grain situation and trends

The area cultivated to wheat in South Africa has been declining for many years and from more than a million hectares in the mid-nineties, reached 482 thousand hectares by 2015 (Figure 37). Most of the decline occurred in the summer rainfall regions, particularly the Free State, where changing rainfall patterns have increased the risk associated with dry land wheat production. Soya beans and maize have also provided a more competitive gross return in recent years. Consequently the share of wheat produced in the winter rainfall regions in the Western Cape has been rising and at 310 thousand hectares, accounted for almost 65% of the national total in 2015. A further 80 thousand hectares was planted in the dry land, summer rainfall regions in 2015 with the remaining 92 thousand hectares planted under irrigation. Given that the dry land yields obtained

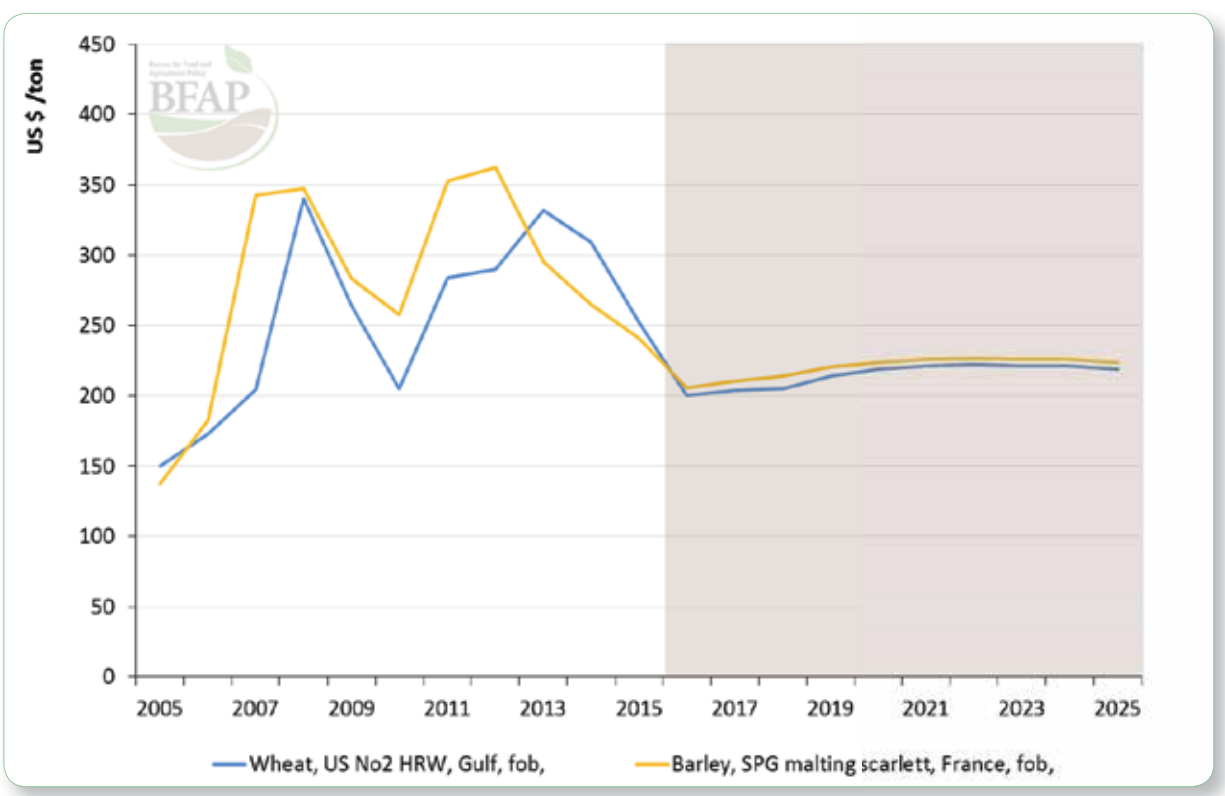


Figure 36: *World winter grain prices: 2005-2025*
Source: FAPRI & BFAP, 2016

in the Western Cape are typically higher than in the Free State (Figure 38), national yield levels have improved significantly and while area declined by an annual average of 5% over the past decade, production fell by less than 2% per annum over the same period.

Within the winter rainfall regions, particularly the Southern Cape, which is represented in the BFAP farm level programme by the prototype farm in the Overberg region, wheat has performed particularly well over the past 5 years obtaining an average yield of more than 3.2 tons per hectare. With prices supported by the combination of a weaker exchange rate and the variable import tariff triggered when the price of US Hard Red Winter wheat drops below $294, gross margins are favourable. Thus area cultivated to wheat in the Western Cape is projected to increase in 2016 and 2017, before consolidating at approximately 320 thousand hectares towards 2025. Having received some rain through March and April, producers with favourable soil moisture conditions in summer rainfall regions such as the Free State and the North West may consider planting winter wheat if they were unable to get their maize in; however the general movement away from wheat in the Free State in particular has resulted in many farmers not being set up for wheat production any longer. Given limited availability of water, these producers are expected to target early maize in 2017 as opposed to winter wheat in 2016. Thus the summer rainfall area is projected to remain fairly constant through 2016 and 2017, before declining marginally to 64 thousand hectares by 2025. Wheat planted under irrigation is also expected to increase in 2016 and 2017, responding to favourable prices, before declining somewhat to just over 85 thousand hectares by 2025. Most of the decline results from rising area being dedicated to high value longer term crops, such as peacan nuts.

Following the expansion of malting facilities at Alrode, demand for malting barley will be firm in the coming years, yet from a producer's perspective, its competitiveness in relation to wheat is dependent on the extent to which current price linkages between wheat and barley are maintained. The baseline assumes that this is the case, resulting in fairly stagnant area under barley in the summer rainfall region. Barley production has also performed well in the Southern Cape, as indicated by the historic yield performance on the BFAP prototype farm in the Overberg region (Figure 38), where the average yield since 2009 almost matched that of wheat. Given a favourable yield outlook following the introduction of new varieties, gross returns are projected to support an expansion of approximately 10 thousand hectares in the Western Cape (most likely in the Swartland region) over the next ten years, at the expense of wheat. Projections for both wheat and barley area are however conditional on the assumption that the current wheat tariff structure remains in place, as it provides firm underlying price support over the 10 year outlook period. The impacts of removing the current tariff are presented in Box 5.1.

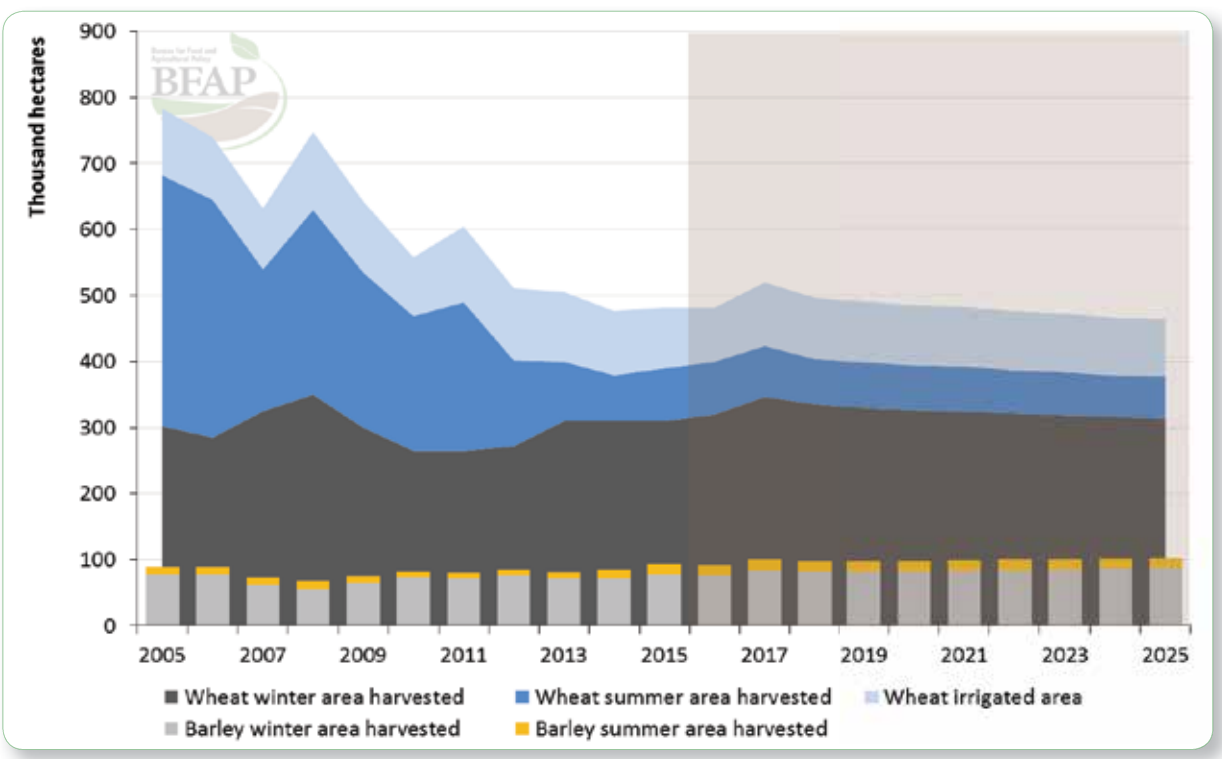


Figure 37: *Winter grain area harvested: 2005 - 2025*

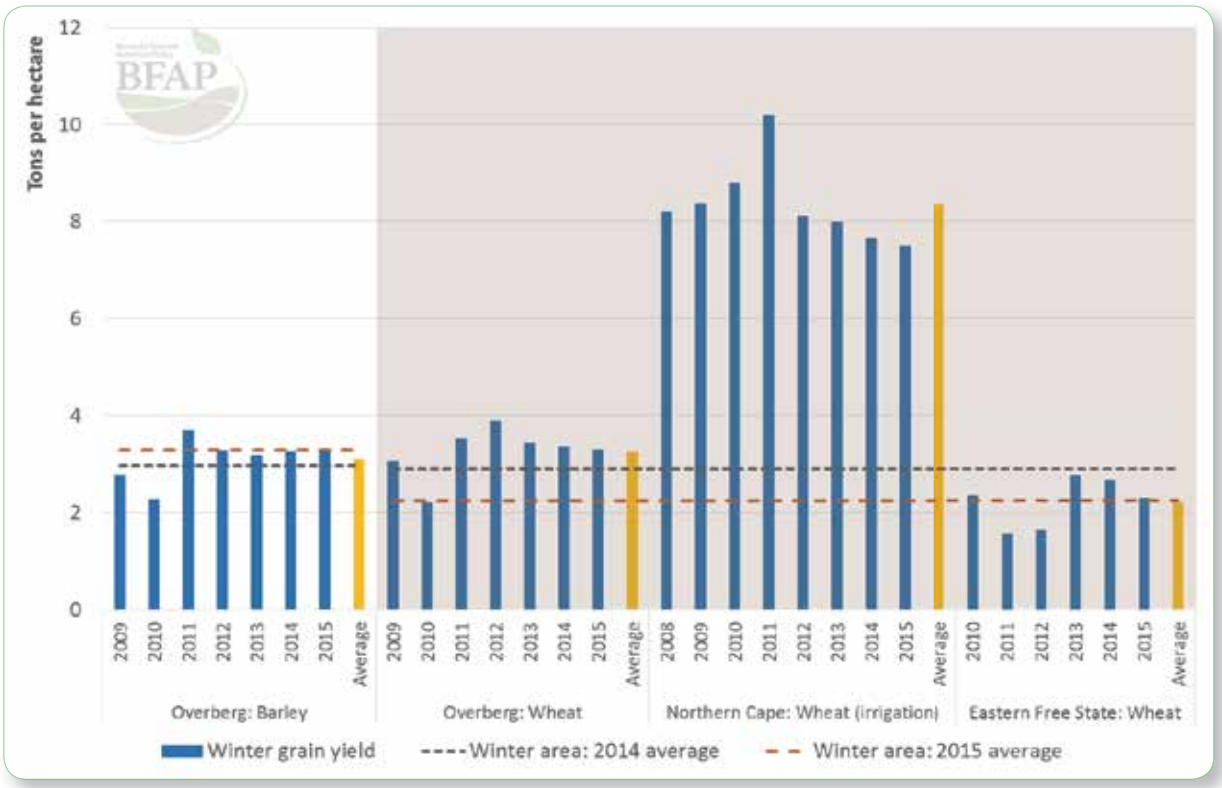


Figure 38: *Historic yield performance of wheat and barley in the BFAP network of prototype farms*

South African wheat production in 2015 also suffered from the drought conditions experienced in both the summer and winter rainfall regions. Poor climatic conditions in the Swartland region through the winter of 2015 reduced the yield obtained in the Western Cape by 22% year on year, resulting in a 17% reduction in South African wheat production. Contrary to most summer grains however, the price impact associated with the drought was minimal in the wheat sector, owing to the fact that South Africa imports more than half of its domestic wheat requirement. Thus while import volumes increased, prices tend to trade at import parity levels in normal years and fluctuations in the domestic harvest have little impact on price levels. Instead, current prices are well supported by the depreciating exchange rate, as well as the variable import tariff which is currently more than R1200 per ton. Thus despite the decline in international prices, the average SAFEX wheat price is projected to rise above R4500 per ton in 2016, an increase of 14% from 2015 levels. Prevailing prices of wheat and alternative staple grains have prompted questions regarding the impact of the current tariff structure on food staple prices, initiating a review of the current tariff structure and possible alternatives. Box 5.1 highlights some implications of changes to the tariff for both the producer and the consumer.

Box 5.1: Considerations on changes to the current wheat tariff structure

Possible changes to the current wheat tariff structure pertain to a delicate balancing act which considers the effect of wheat production on rural economies, combined with the multipliers created from domestic production, versus the impact of higher raw material costs on bread and flour prices. Furthermore, higher wheat prices have a knock on effect on other industries such as barley and canola. Various alternatives to the current tariff structure exist, one of which is a switch to an ad valorem tariff, which is not ideal given that the principal of counter-cyclical support only in times when world prices are low is lost. Another alternative is to replace the current dollar based system, which tends to exacerbate the impact of the tariff on high food prices during periods when the Rand depreciates, with a Rand based formula. The most severe and least ideal alternative is complete removal of the tariff support.

Producer consideration: Supporting gross margins to maintain production

The current wheat tariff was put in place to support domestic producers, allowing them to compete with lower cost imported wheat and therefore maintain area under wheat production – particularly in the Western Cape, where alternatives are more limited. Justifying the need for some tariff protection, Figure 39 illustrates the impact of complete tariff removal on producer margins in the Southern and Western Cape. For the purpose of the scenario, the total cost of wheat and barley production (direct- and overhead costs) from the Overberg prototype farm was considered to calculate a medium and long term average break-even price, as illustrated by the grey and blue bars in Figure 39. Considering the larger region, the long term average wheat and barley yield for total winter rainfall area was also introduced, as opposed to the actual yields obtained on the Overberg prototype farm. For illustrative purposes, respective farm gate prices were adjusted by the current tariff value of R1224/ton, represented by the dashed lines in Figure 39. It is important to note that the existing high SAFEX wheat price will not prevail at farm-level due to a number of compulsory deductions which can exceed R750/ton for wheat. These deductions include the transport differential, possible grade/quality deductions and other related supply chain expenditures. For barley the same is true, however, different deductions and price premiums are accounted for.

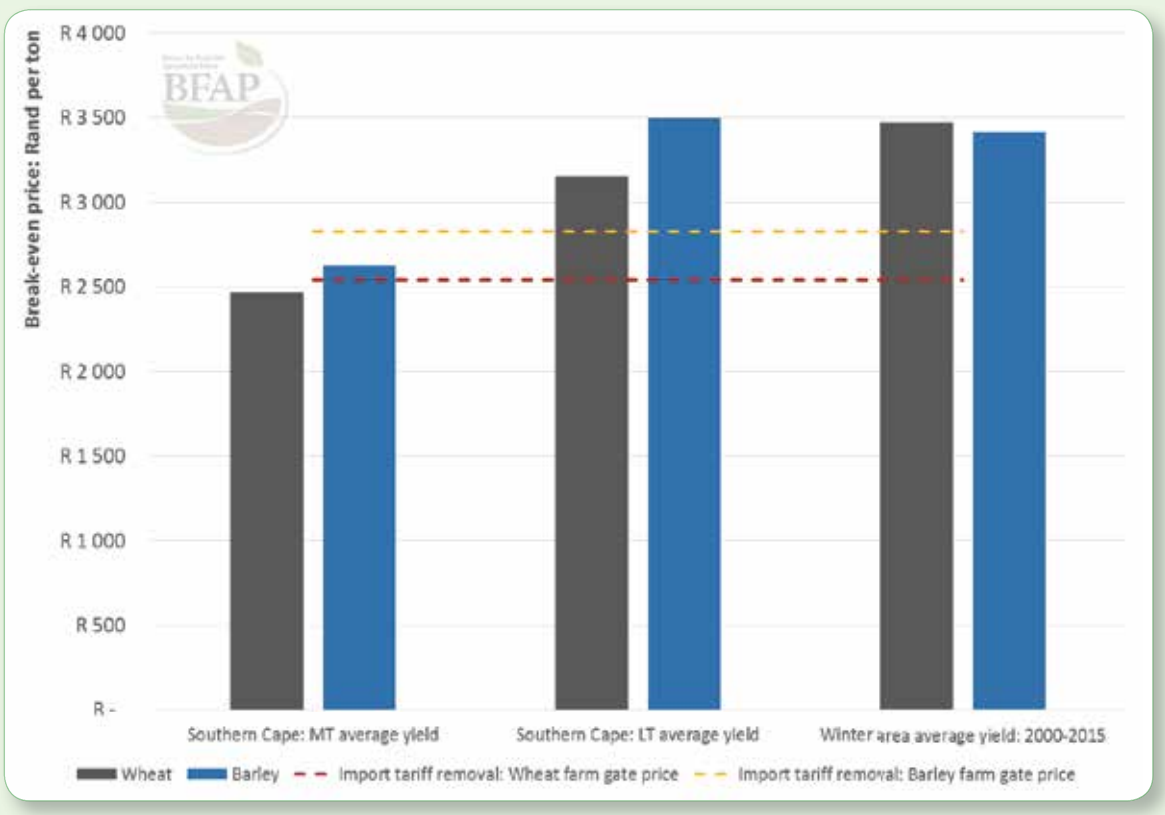


Figure 39: *Break-even price analysis & tariff removal scenario: Implications in the Southern and Western Cape*
Source: Data from Overberg Agri & BFAP calculations, 2016

Figure 39 suggests that considering the medium term average yield attained in the Southern Cape, producers will barely remain above break-even prices for both wheat and barley if the tariff is removed completely. Consideration of a long term average yield however results in farm gate prices falling well below break-even prices. A similar picture is true when the entire winter area average yield is considered, illustrating that the cost of producing a ton of wheat is higher than the estimated farm gate prices without tariff protection. Ultimately this relates to unprofitable production, which will affect domestic wheat production in the long term. The decline in wheat area in the Eastern Free State, where gross margins came under pressure in recent years as a result of low yields related to changing rainfall patterns provides an indication of the extent of the impact when production is no longer competitive. The strict competition from alternative summer crops such as maize and soya

beans, together with low margins and associated risk in wheat cultivation caused a significant decrease in area under wheat. In the Eastern Free State region, a number of alternative crops exist as substitutes for wheat, however in the Western and Southern Cape, alternatives are rather limited due to the unique climate in the region.

The effect of the current wheat tariff on consumer food prices

While support to domestic producers is justified, the impact of a tariff in excess of R1200 on food prices must also be considered, particularly in the present scenario when food prices have reached an all-time high. Figure 40 indicates that the cost equivalent of wheat in a brown bread has moved largely sideways over the 25 odd months under consideration. By contrast, average monthly brown bread prices appear to have trended upwards. This could be regarded as evidence, albeit anecdotal, of a weak relationship between the retail price of bread and the local commodity price for wheat. There are several pragmatic issues that support this notion. The wheat value chain is relatively long and sophisticated, resulting in a cost share of wheat in the final retail price of bread of only around 20%. Combined with the differences in the price determination process of wheat and bread, this implies that the effect of a shift in the wheat tariff on bread prices is minimal. South African wheat prices are determined in a global milieu in which South Africa is a very small player. As a result, domestic supply and demand factors have little effect on global prices. Retail prices, in turn, are determined in the context of a wider fast moving consumer good environment where other key input costs such as labour, electricity and distribution cost have a definite effect. These factors can be considered as fundamental factors driving the increasing margin between wheat cost equivalents of bread and final retail prices of bread.

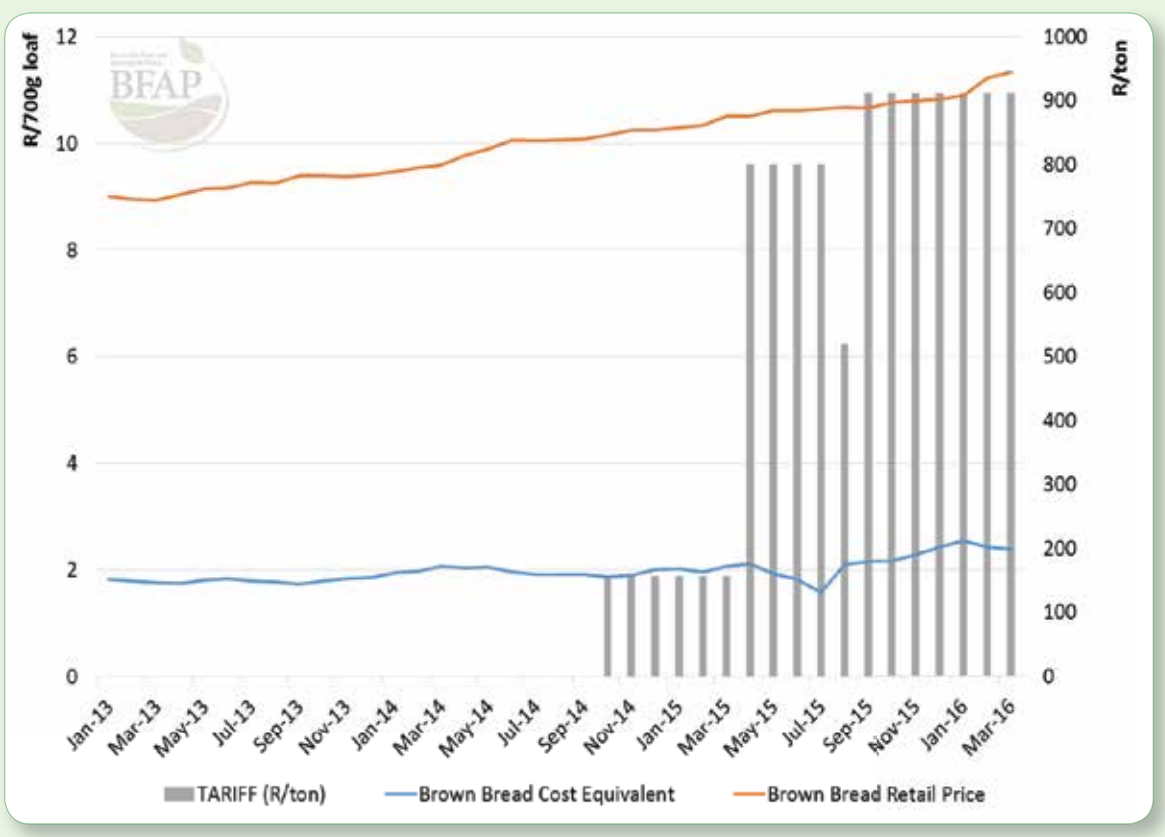


Figure 40: *Brown bread retail price and wheat cost equivalent in a brown bread (Jan 2013- March 2016)*

Ultimately the sustainability of wheat production in South Africa cannot depend merely on tariff protection. Therefore it is encouraging that average yields achieved in dry land production over the past decade have improved consistently at a rate comparable to global trends. Going forward, a long term drive towards improved productivity remains critical. The industry has put a number of initiatives in place to achieve this, including a review of breeding and grading regulations and international technical agreements with research institutes, yet competition from countries with a more favourable natural resource structure remains stiff. In many of these countries, such as in Europe, some form of support will always be provided to producers, implying that South Africa is unlikely to compete with no tariff support in place.

Box 5.1 elaborates on the need for support to keep South African producers competitive in the global context; however a fundamental question relating to the need for tariff support are the reasons underlying South Africa's lack of competitiveness in wheat production. Figure 41 illustrates international wheat yield trends and indicates that South African dry land yields are substantially lower relative to key wheat producers in the world market (refer to the prototype farm name: ZA2500OV and the 2015 winter wheat area average). The international sample average (red dotted line) is calculated at 5.8 tons per hectare, approximately 2.5 tons per hectare better than the South African winter area average in 2015 and 2.7 tons higher than the Southern Hemisphere dry land average which include Argentina, Australia and South Africa. The latter suggests that the Northern Hemisphere has an advantage over the South due to improved climatic conditions. Domestically, there exists an on-going argument over seed varieties and quality requirements that restrict wheat yield improvements. Despite these challenges, wheat yields in the Southern Cape have improved significantly in recent years, mainly due to better cultivation practises and improved weather conditions. Despite the improvement, the yield gap to Northern Hemisphere counterparts remains and hence the cost of production for South African dry land producers in the Southern Cape is well above the sample average (Figure 42).

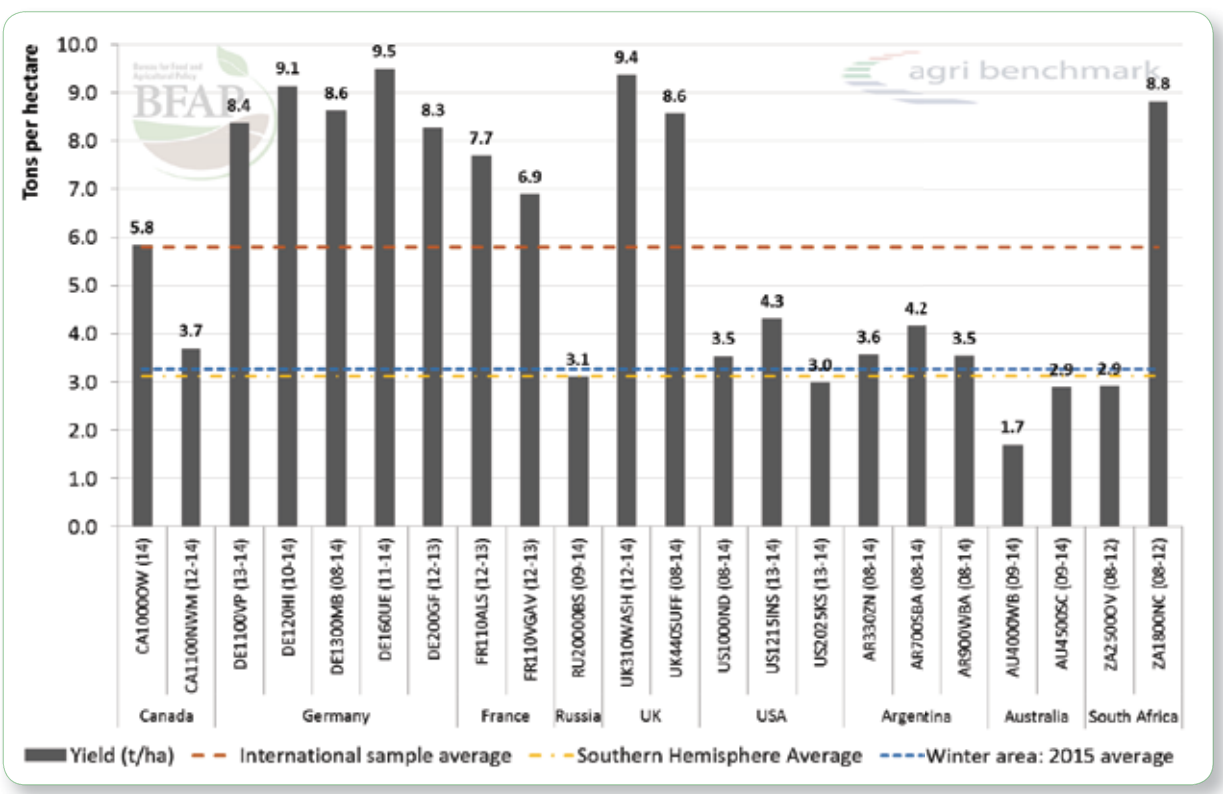


Figure 41: *International wheat yield trends*
Source: agri benchmark & BFAP, 2016

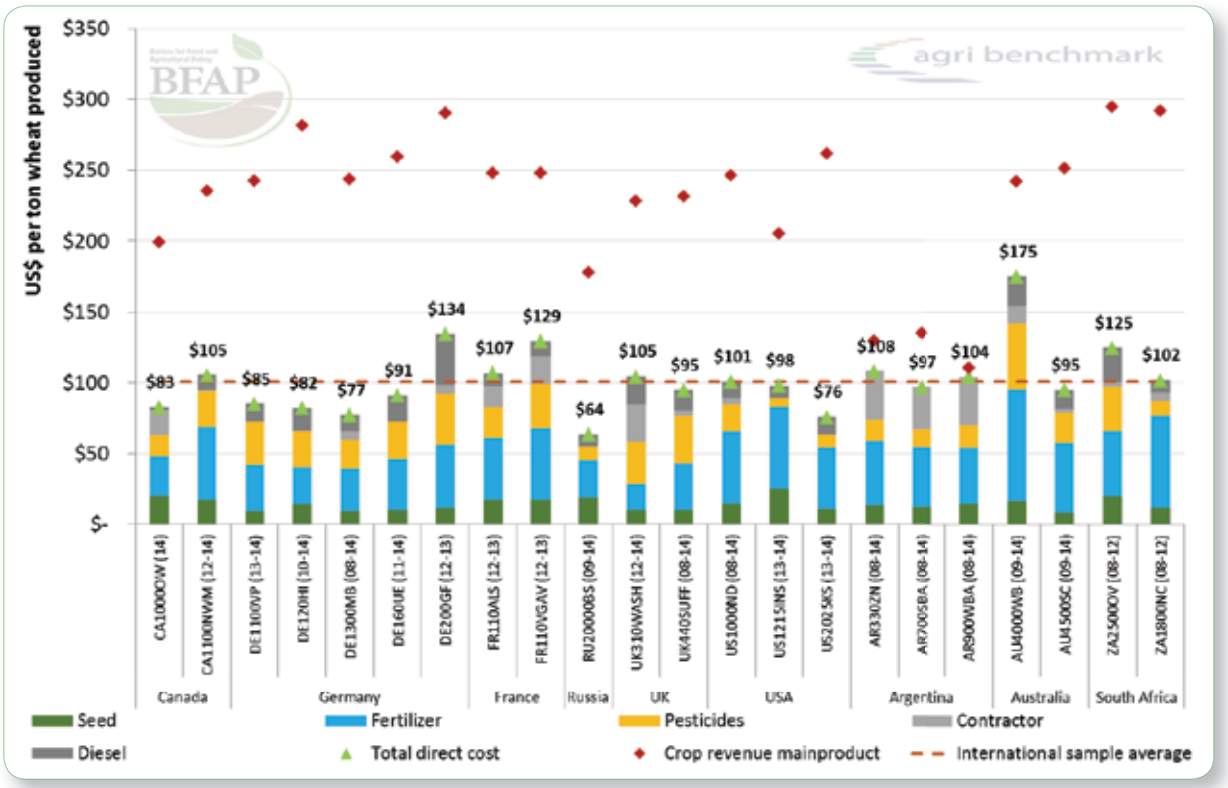


Figure 42: *Wheat direct cost comparison: US$ to produce a ton of wheat*
Source: agri benchmark & BFAP, 2016

Figure 42 illustrates that the dryland Overberg prototype farm in the Southern Cape spends on average US$24 more to produce a ton of wheat compared to the international sample average of US$101 per ton. While South Africa's cost structure remains high relative to the global sample space, margins are supported by a higher price. Much of this results from the current tariff structure and given the international price projection presented in Figure 36, the average import tariff over the next decade is projected to exceed R1200 per ton.

Following an initial increase in 2016 and 2017 resulting from increased area and a return to trend yields, wheat production in South Africa continues to stagnate, with yield growth offsetting much of the decline in area planted. By 2025, production is projected at just over 1.7 million tons, hardly 44% of total domestic wheat demand. Demand growth of more than 300 thousand tons over the next decade relates to per capita consumption growth of 0.5% per annum, reaching 66kg per capita by 2025. In order to meet this demand, imports are projected to reach 2.4 million tons by 2025 (Figure 43). Given this continued dependence on imported wheat, prices will continue to be determined by import parity levels and therefore exchange rate volatility will be an important factor underlying price fluctuations over the next decade.

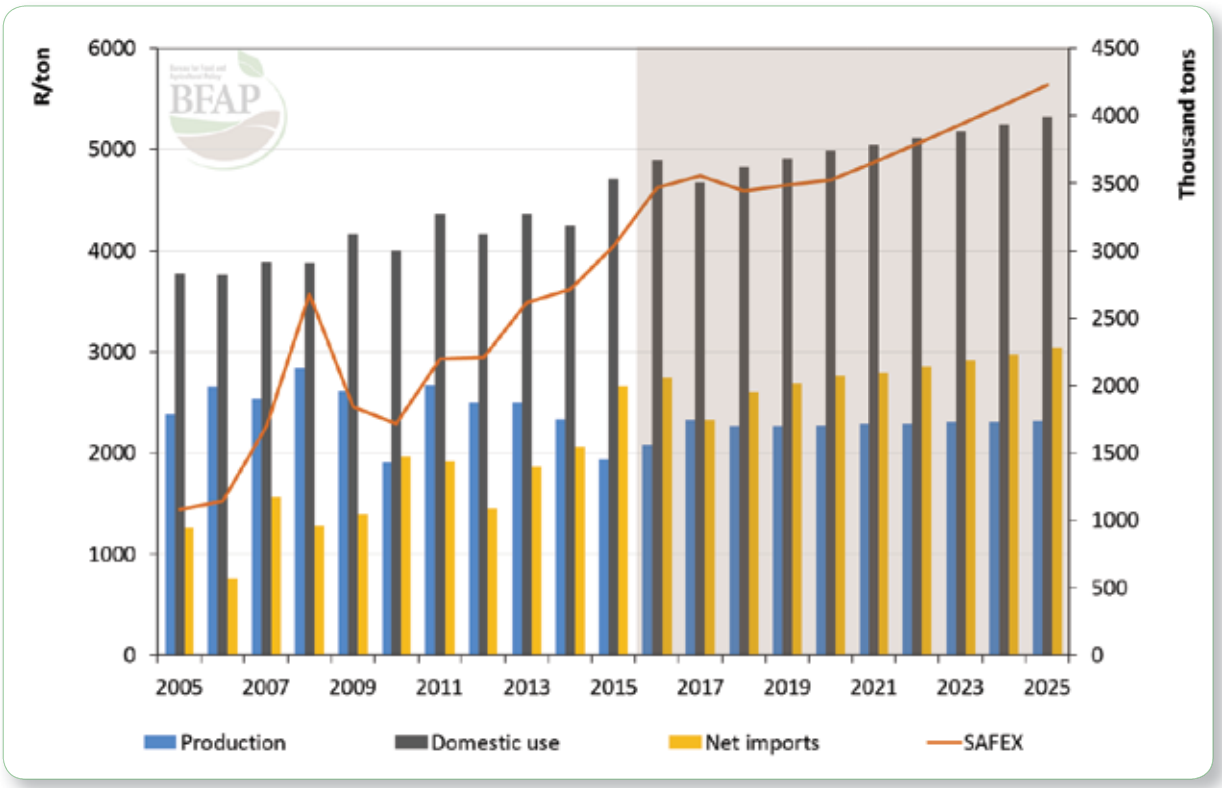


Figure 43: *Wheat production, consumption, trade and price: 2005 - 2025*

Domestic barley situation and trends

The impact of the current drought was less evident in barley production relative to wheat in 2015 and while yield levels did decline, the expansion in area planted to barley was sufficient to induce a 10% increase in barley production year on year. Despite a marginal decline in area planted in 2016, a return to trend yields is projected to result in another production increase. In light of the expansion in malting facilities at Alrode, domestic maltings are expected to replace a significant share of previously imported malt over the next 2-3 years, causing a significant step in the demand for malting barley (Figure 44). In response, domestic barley production is expected to grow at an average rate of 2% per annum over the next 10 years. After the initial decline associated with stock changes following delays in the expansion of malting facilities at Allrode, barley import stabilise at around 50 thousand tons per annum, well below the part decade's levels. The expanded malting facilities could also allow for some malt exports into the rest of the Southern African region.

In light of the continued process of ABInBev's acquisition of SAB Limited, the barley projections presented in Figure 44 remain subject to significant uncertainty. The extent to which the current contracting and pricing structure, which links barley to wheat is maintained going forward will be an important factor influencing the relative competitiveness of the two crops. Changes in this regard may influence the area projections and similarly, productivity growth may be influenced by the extent of continued research and development in the sector.

Based on agribenchmark data, an international comparison related to the relative competitiveness between wheat and barley suggests that wheat yields typically outperform barley yields (Figure 45). In selected regions in Germany, barley yields performed better than wheat, but on average, the wheat yield achieved in Australia, South Africa, Russia, Germany and the United Kingdom (UK) is approximately 0.5 tons per hectare higher than that of barley.

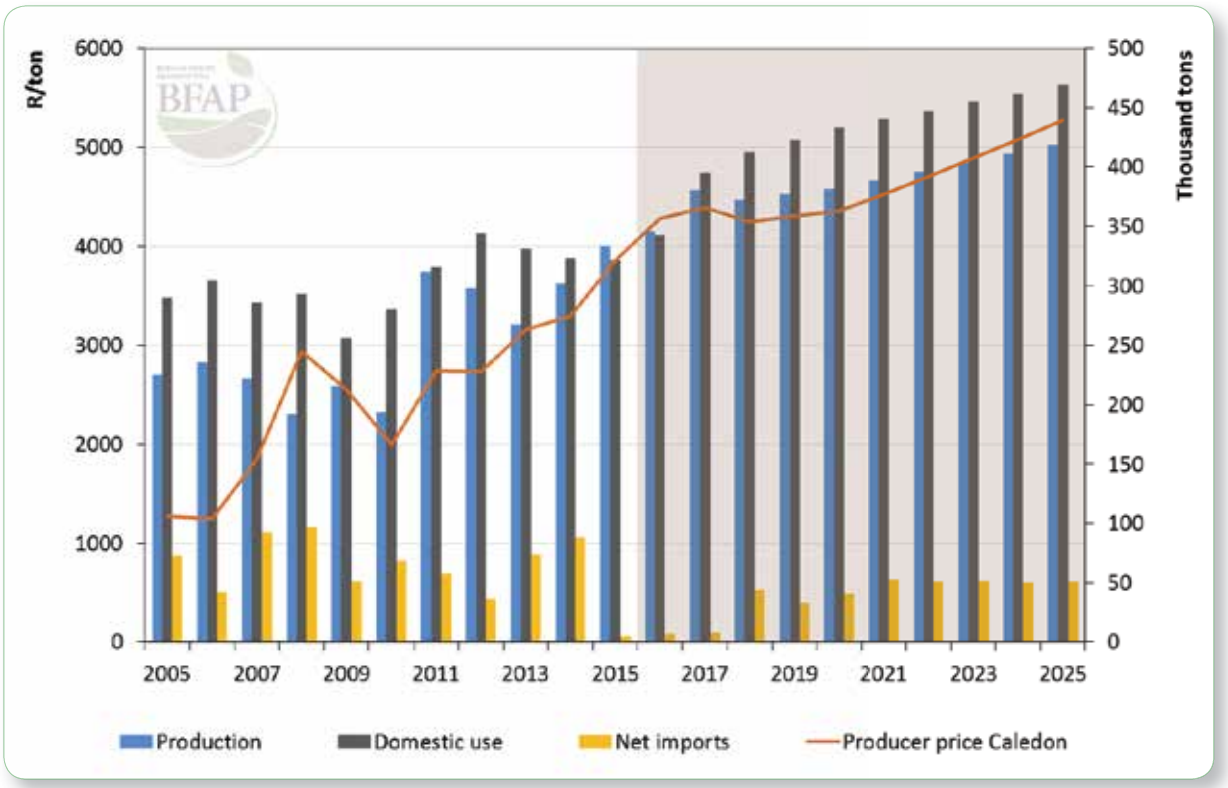


Figure 44: *Barley production, consumption, trade and producer price: 2005-2025*

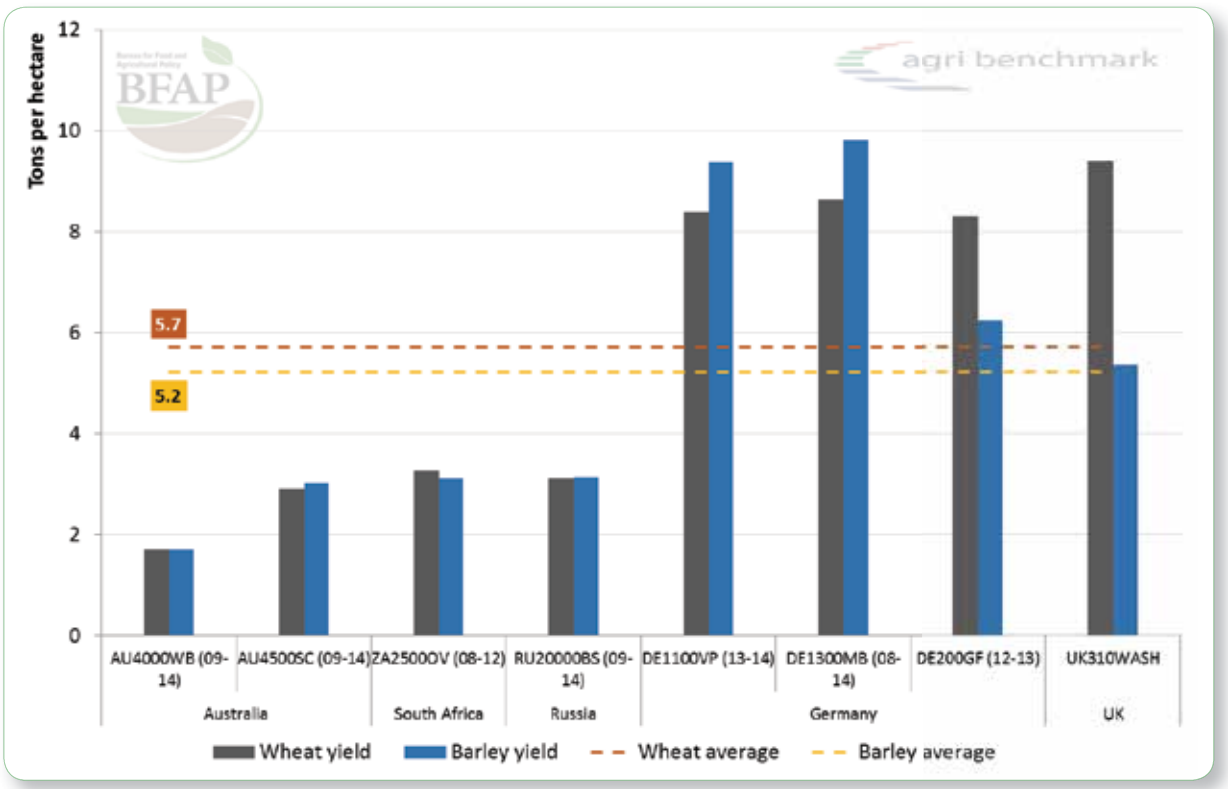


Figure 45: *Wheat and barley yield trends across the globe*
Source: agri benchmark & BFAP, 2016

Further elaborating on competitiveness, Figure 46 presents the respective margins (per ton and per hectare) attained for wheat, barley and canola in the international sample average, as well as the Overberg prototype farm. For the international sample, the wheat gross margin was US$82 per hectare higher than barley, however the return from canola remains significantly above both wheat and barley. The opposite is true on the Overberg prototype farm, where barley margins are higher than wheat and canola, mainly due to associated lower direct cost in barley. Furthermore, the low yields obtained in canola production cause poorer performance against substitute crops in the Overberg region. Given the benefits of canola in the context of crop rotation, it remains an important crop in the region.

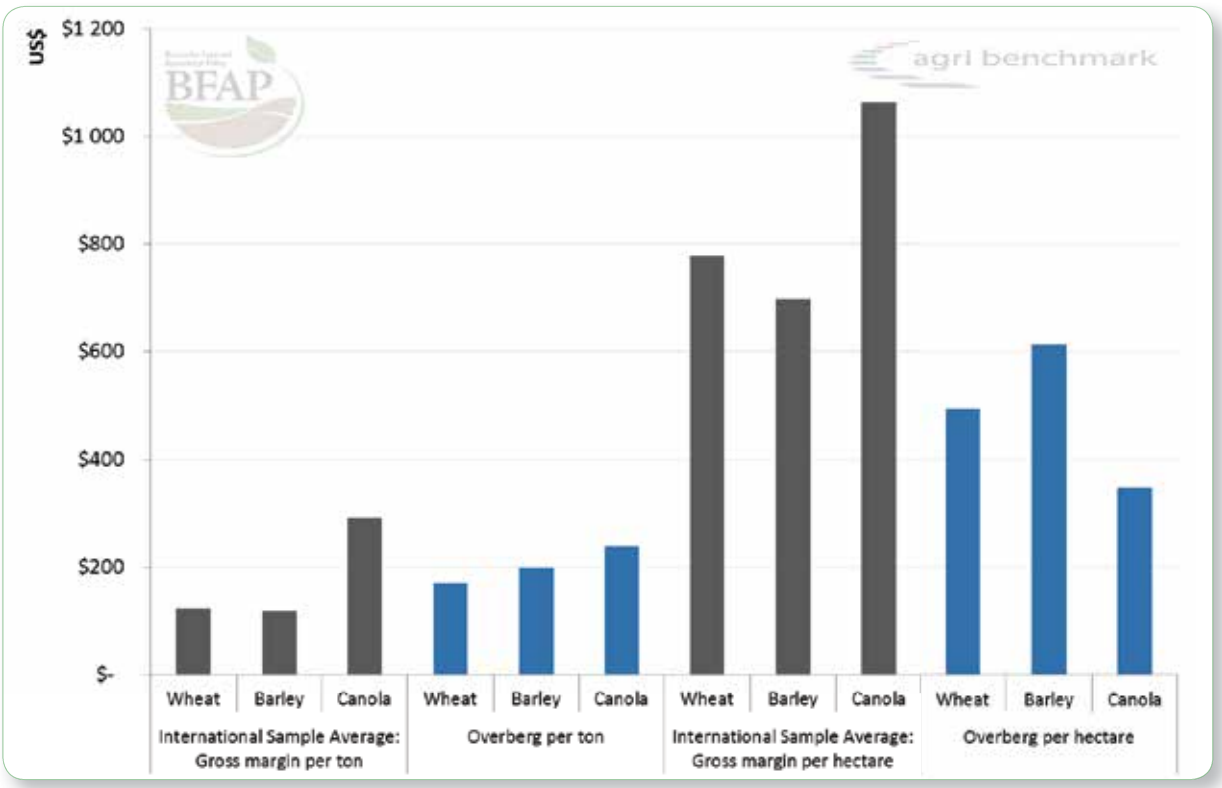


Figure 46: *Gross margin comparison of winter crops*
Source: agri benchmark & BFAP, 2016

SOUTH AFRICAN OUTLOOK

Outlook for field crops

OILSEEDS AND OILSEED PRODUCTS

In South Africa, sunflower was the only summer crop for which area did not decline in 2015/16 owing to its resilience under drought conditions and extended planting window. However, in the long run it is soyabean area that is expected to expand by an annual average of 5% to almost 1 million hectares by 2025. This comes in response to recently expanded crushing capacity.

Global oilseed situation and trends

Global soya bean production increased in 2015, while production of other major oilseeds including sunflower and canola declined relative to 2014 levels. Global canola production is expected to decrease by 2 million tons in the 2016 season, as reduced plantings in higher yielding areas offset the 700 thousand hectare increase in area cultivated to canola in India (a typically lower yielding area). In light of the decline, the stocks to use ratio for canola seed is projected to reach its lowest level since 2003. Sunflower seed production is expected to reach 41.2 million tons in 2016, a 5% increase from 2015 levels on a slightly larger area. International oilseed stocks (particularly soya bean stocks) are forecast to decline due to increased demand for soya beans and a below average crop following challenging weather conditions in Argentina.

Soya beans account for the largest share of global oilseed demand and the U.S., Argentina and Brazil account for the majority of global production and exports. Soya bean production is expected to continue expanding over the outlook period, albeit at a slower annual rate of 2.4%, compared to the 4% over the past decade. Over the next decade, close to 40% of global soya bean consumption will be supplied by trade. The production of other oilseeds is also expected to slow going forward, growing at only a third of the 3.6% annual average production growth rate experienced during the past decade.

After declining from the peaks of 2012/13 due to increased stock levels, oilseed prices are expected to bottom out in 2015/16, at a higher level than before the run-up owing to a higher underlying cost structure. As supply consolidates, a marginal increase is expected over the course of the outlook, yet the combination of lower crude oil prices and reduced international grain prices results in a stabilisation well below recent peaks. In major producing areas, as well as in South Africa, canola competes with barley and wheat for area, however, on the demand side, canola products compete with other oilseeds.

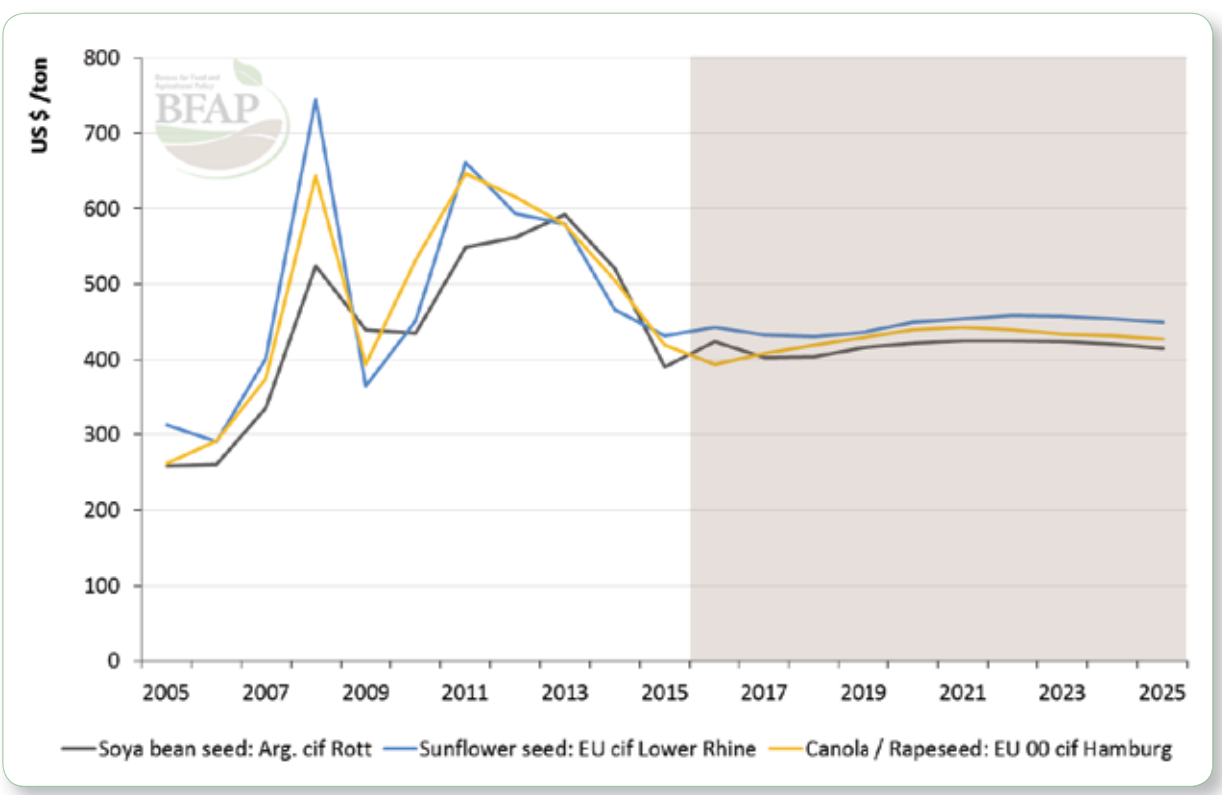


Figure 47: *International oilseed prices: 2005-2025*
Source: FAPRI and BFAP, 2016

Domestic oilseed situation and trends

The drought conditions during the optimal planting window throughout the South African summer production area caused a sharp reduction in both maize and soya bean area in 2016. Owing to its resilience in drought conditions, as well as its extended planting window in the Western parts of the summer rainfall region, sunflower is the only summer crop that saw an expansion of production area in 2016. The shift from soya beans to sunflower is evident in Figure 48, which indicates that soya bean area declined by more than 180 thousand hectares from 2015 to 2016 (-26.8%), whereas sunflower area expanded by more than 140 thousand hectares (24.7%). However, responding to high demand arising from expanded crushing capacity, soya bean area is expected to increase sharply in 2017 by 140 thousand hectares and will continue on a firm growth path going forward, expanding at an annual average of almost 5% to just under 1 million hectares by 2025. Given the assumption of normalised rainfall during the outlook period, sunflower area is expected to decline in 2017, almost back close to 2015 levels, before stabilising at around 560 thousand hectares over the medium term (Figure 48).

Since peaking at 95 thousand hectares in 2014, the area cultivated to canola declined to under 80 thousand hectares in 2015 and is expected to decline further to a mere 68 thousand hectares in 2016. Canola is grown in the winter rainfall regions in the Western Cape and while its products compete with those of sunflower and soya beans on the demand side, it competes with winter grains such as wheat and barley for planting area. Given that wheat and barley prices are supported by the variable tariff on imported wheat, gross margins have tended to support winter grain production as opposed to canola. Presenting gross margin as a proxy for competitiveness, Figure 49 indicates that in the Overberg region, canola has struggled to compete with wheat and barley over the past 5 years. Cultivar development, the adoption of conservation tillage practises and improved rainfall conditions in the Southern Cape have supported significant yield gains for wheat, barley and canola. While yield growth rates for canola have matched that of wheat and barley, it has been achieved from a very low base and for canola to attract more hectares (especially in the Swartland) yield growth rates will have to improve in the future.

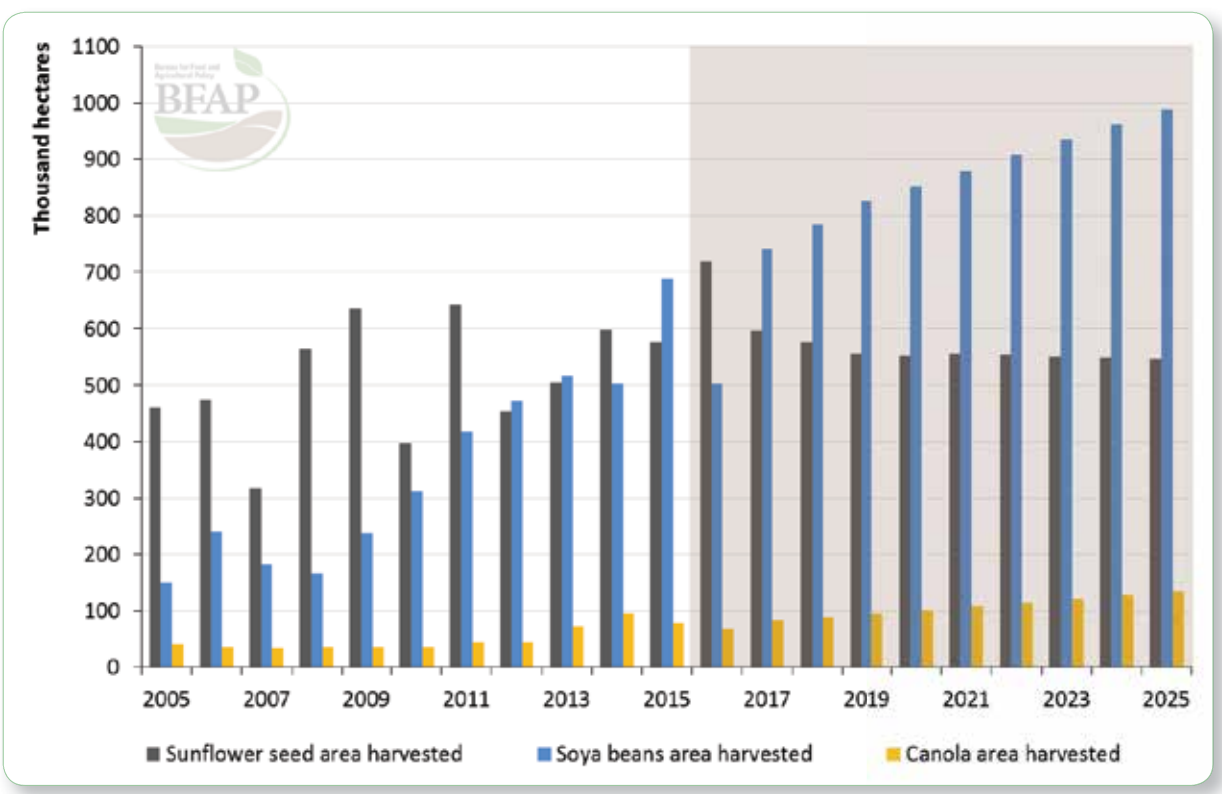


Figure 48: *Oilseed area harvested: 2005-2025*

Despite low yields for canola over the past few years, Figure 50 points to significant scope for improvement in domestic canola yields. This is supported by agri benchmark data which compares yields obtained on the Overberg prototype farm against key international canola producers. The average yield of 1.5 tons per hectare obtained on the Overberg farm over the period from 2008 to 2012 is approximately 2.0 tons per hectare less than the international sample average of 3.5 tons per hectare. Currently there is a strong overall incentive for expansion in the industry with greater crushing capacity, significant drive in technology transfer and the potential introduction of GM canola in the near future, which will boost its relative competitiveness. Thus, considering the assumption that domestic canola yields will start to improve significantly due to the introduction of better adapted high yielding canola varieties, as well as the associated benefits of including canola as part of a winter crop rotation, the area planted to canola is projected to increase by an annual average of just over 6%, exceeding 130 thousand hectares by 2025 (Figure 48).

Soya beans have become the most important oilseed crop in South Africa, with production surpassing sunflower in 2012. Despite less than ideal weather conditions, 2015 provided an all-time record crop of more than 1 million tons, on 687 thousand hectares. This represents a doubling in production since 2009. In addition to the abovementioned contraction in soya bean area in 2016, the average soya bean yield is expected to decrease by 11% owing to poor rainfall and warm weather conditions during the 2015/16 production season; resulting in a harvest of only 694 thousand tons - a 35% decrease from 2015. Further area expansion from 2014/15 levels, combined with a return to trend yields is expected to push soya bean production above 1.3 million tons in 2017. Production is projected to exceed 2.2 million tons by 2025, supported by continued area expansion and average annual yield growth of 4%.

Following rapid expansion since 2013, South Africa's maximum soya bean crushing capacity is estimated at 1.75 million tons. However, when including dual capacity plants which can crush both soya and sunflower, the maximum crush capacity is estimated at 2.5 million tons. Given the rapid expansion, South African producers have been unable to supply sufficient soya beans and even prior to the 2016 drought, domestically produced beans were supplemented with imports in 2014 and 2015. Consequently soya bean prices have broken away from export parity levels, raising the cost of raw materials relative to its sales products namely soya bean meal, soya bean oil, hulls and screenings. Historically the share of the soya bean

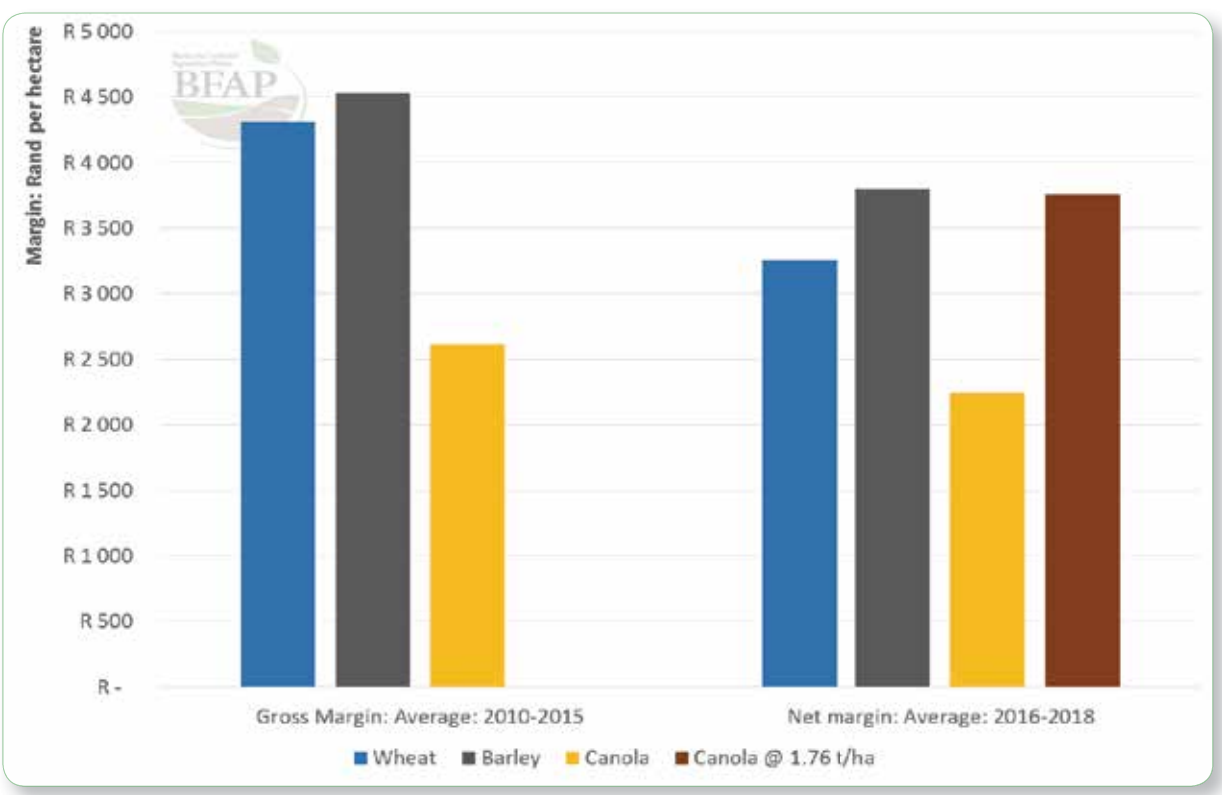


Figure 49: *Winter area: Gross margin comparison to measure competitiveness*
Source: Overberg Agri & BFAP calculations, 2016

Figure 50: *International canola yield comparison*
Source: agri benchmark & BFAP, 2016

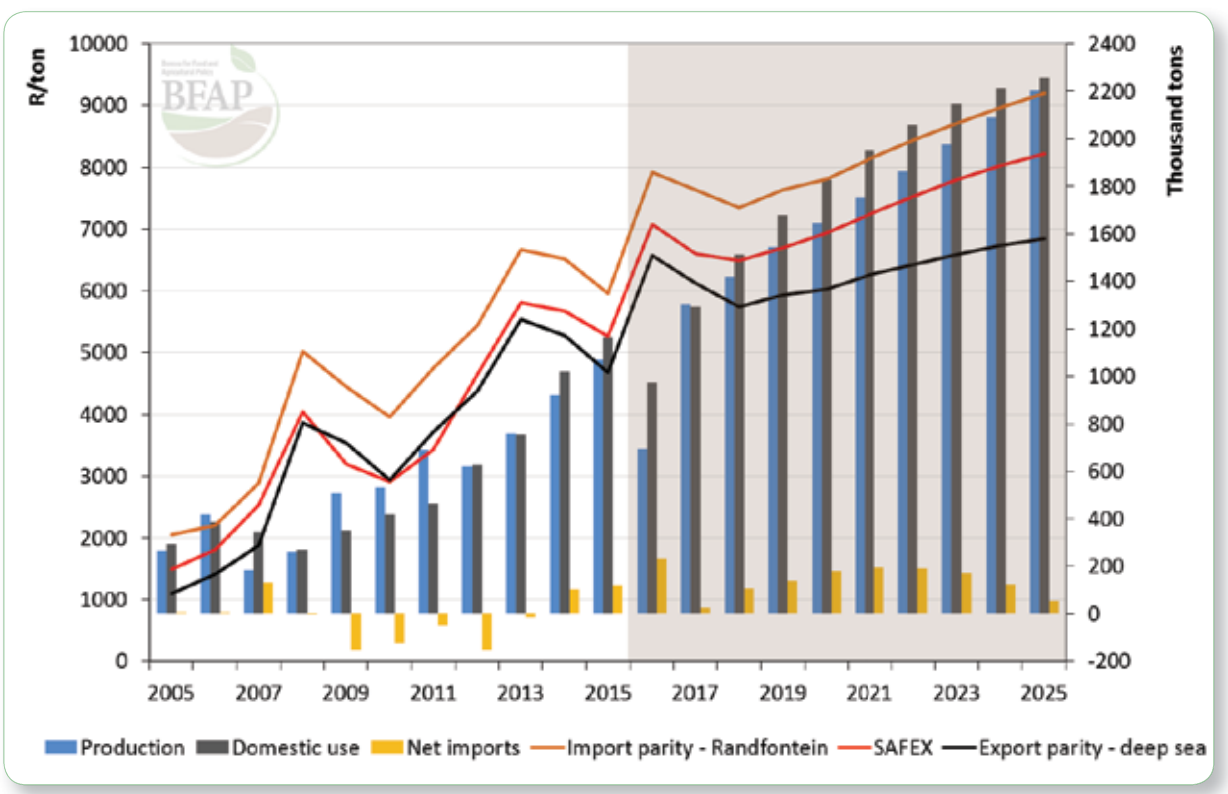


Figure 51: *Soya bean production, consumption, trade and prices: 2015-2025*

price in the soya meal price in South Africa was considerably lower relative to other global producers such as the US, Brazil and Argentina due to the lack of domestic processing capacity. However, with the rapid expansion in crushing capacity, these margins have narrowed since 2014 and by 2015, the ratio of soya bean to soya meal prices in South Africa was higher than both Brazil and Argentina (Figure 52).

While South African soya bean crushers have not benefitted from the same improvement in bean to meal ratio evident in international markets in recent years, the realities are that soya meal and soya oil continue to trade at import parity levels. This does provide some room to create profitability, if a crusher is efficient and capacity is utilized to the maximum, since domestic soya bean prices are likely to remain below import parity levels. The fact that international producers such as the US, Brazil and Argentina, are able to crush profitably when soya beans, soya meal and soya oil are all trading at export parity prices suggests that South Africa should be able to do the same with product prices at import parity. This has however not been the case, as utilisation rates in domestic crushing plants remain well below the industry benchmark of 80%. At lower utilisation rates, the fixed cost component within total production costs increases and undermines profitability. Hence, assuming increased utilisation rates coupled with improved plant efficiencies compared to global best in class standards over the course of the outlook, reduced fixed cost per ton of produce should allow crushers to remain profitable even when soya bean prices trade above export parity levels.

In order to reach the industry benchmark utilisation rate of 80% over the next few years, a fine balance will need to be maintained between positive crushing margins and the need to import soya beans to ensure consistent supply to local crushers and allow maximum capacity utilization. By 2025, more than 2.1 million tons of soya beans are projected to be crushed domestically, implying that both the dedicated soya crushing plants and the dual capacity plants will be utilised for soya beans, at the benchmark rate of 80% (Figure 53). Accounting for some full fat soya utilised in the animal feed market and stock changes implies that only 3% of the soya beans required to fulfil domestic crushing demand is projected to be imported by 2025.

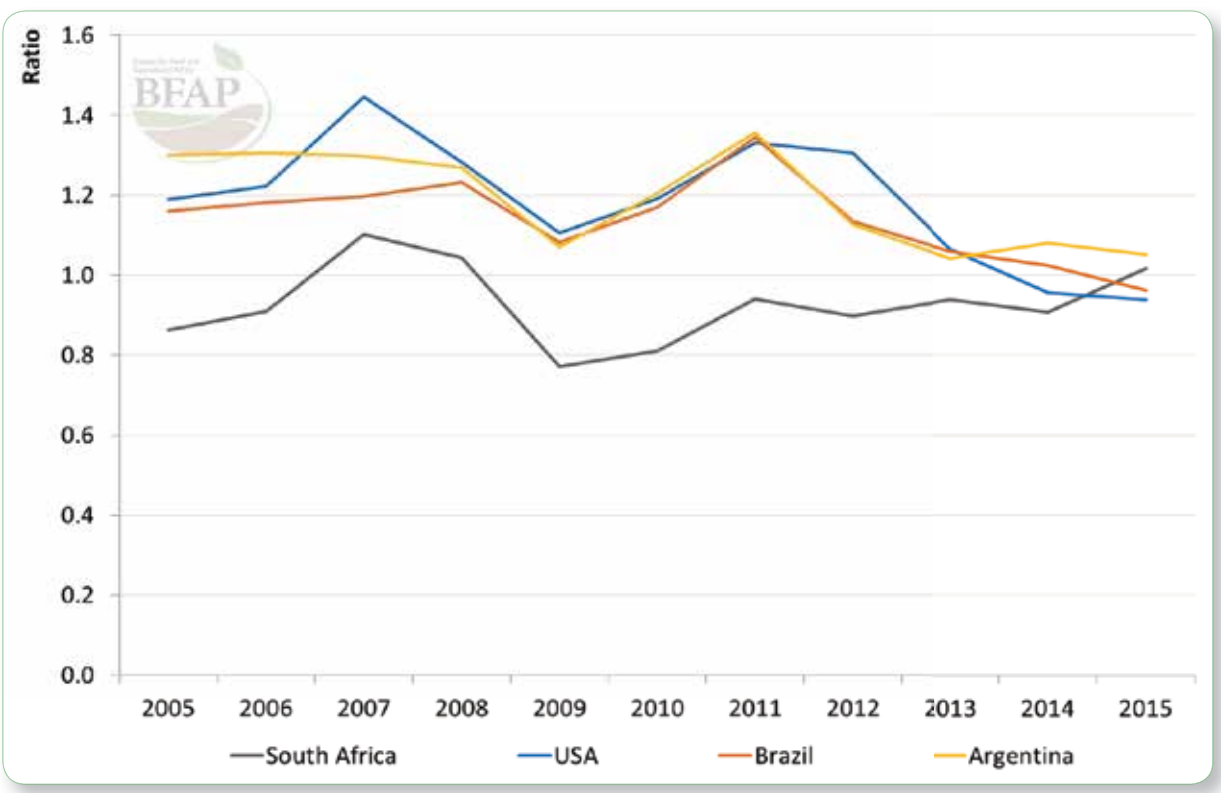


Figure 52: *Soya bean to soya meal ration in South Africa, USA, Brazil and Argentina: 2005-2015*

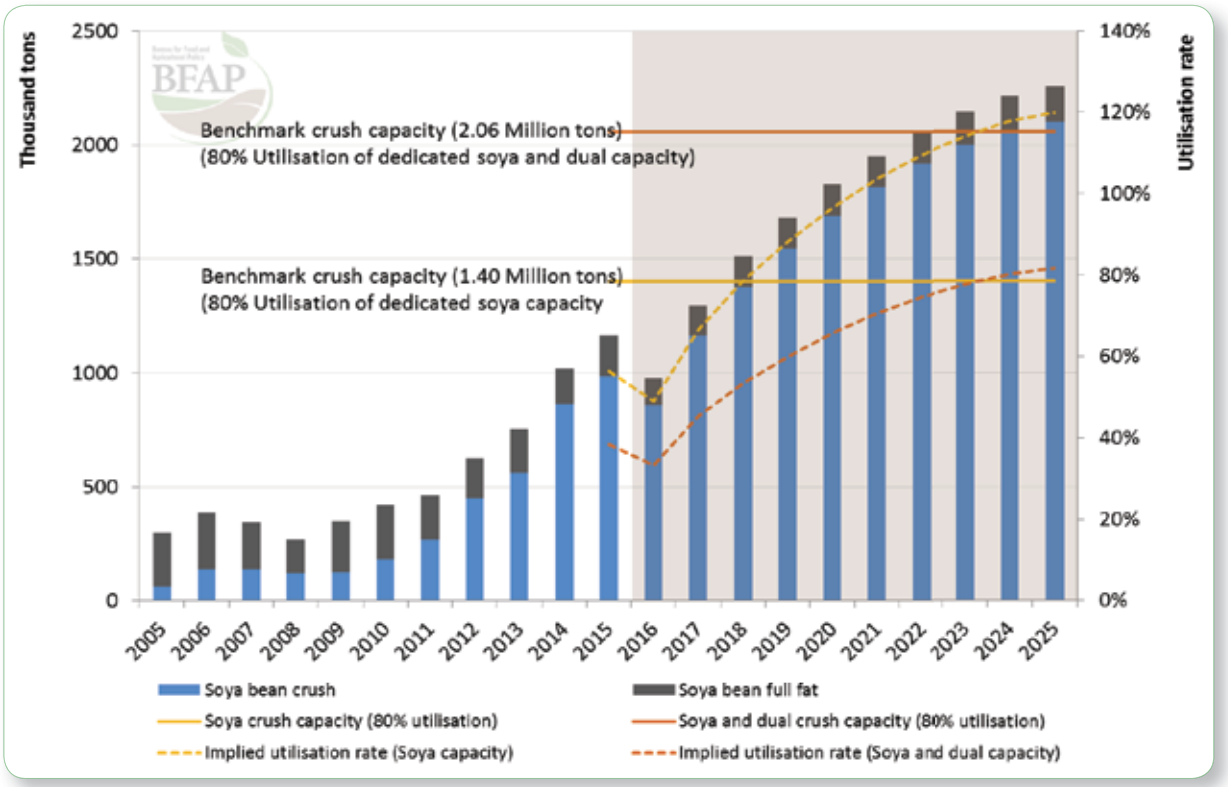


Figure 53: *Soya bean utilisation and crushing capacity in South Africa: 2005 - 2025*

The expansion in sunflower area in 2016 (24.7%) was off-set to some extent by a decrease in average yields from 1.15 tons per hectare in 2015 to an expected 1.02 tons per hectare in 2016. Therefore total sunflower seed production is expected to amount to 730 thousand tons, a 10% increase from 2015 levels. Going forward, an average increase in production of 1.4% per annum is expected over the outlook period to reach 820 thousand tons in 2025, driven by an average annual yield improvement of just under 3% towards 2025. The production and crushing demand for sunflower seed is projected to remain in a fine balance over the course of the outlook period, with small volumes (less than 5% of domestic use) being imported. Therefore prices are expected to trade between import and export parity levels, largely derived from the price of oil and meal. Similar to the price of soya beans, the sunflower price is projected to trade sideways up until 2018 after which the price projection increases in line with parity price trends.

The firm shift towards sunflower production during the current drought is also evident in the BFAP network of prototype farms, reflecting the extended planting window, as well as the ability of sunflower to perform better under drought related stress conditions. Figure 55 illustrates the relative performance of maize and sunflower gross margins for the prototype farms situated in the Northern Free State and North West province. For the North West province, the 2012, 2013, 2015 and 2016 production seasons were associated with low precipitation levels. For the Northern Free State, 2013, 2015 and 2016 were also considered dry years.

Evident from Figure 55 is that sunflower yields and hence also margins for both key producing regions reflect better than maize in dry years, particularly in the 2015 production season. In the North West province, maize gross margins were well below sunflower in 2015 when yields declined substantially. Sunflower production will therefore remain important from a crop and risk diversification perspective and will serve as a plausible alternative in years associated with pre- and post-season drought conditions.

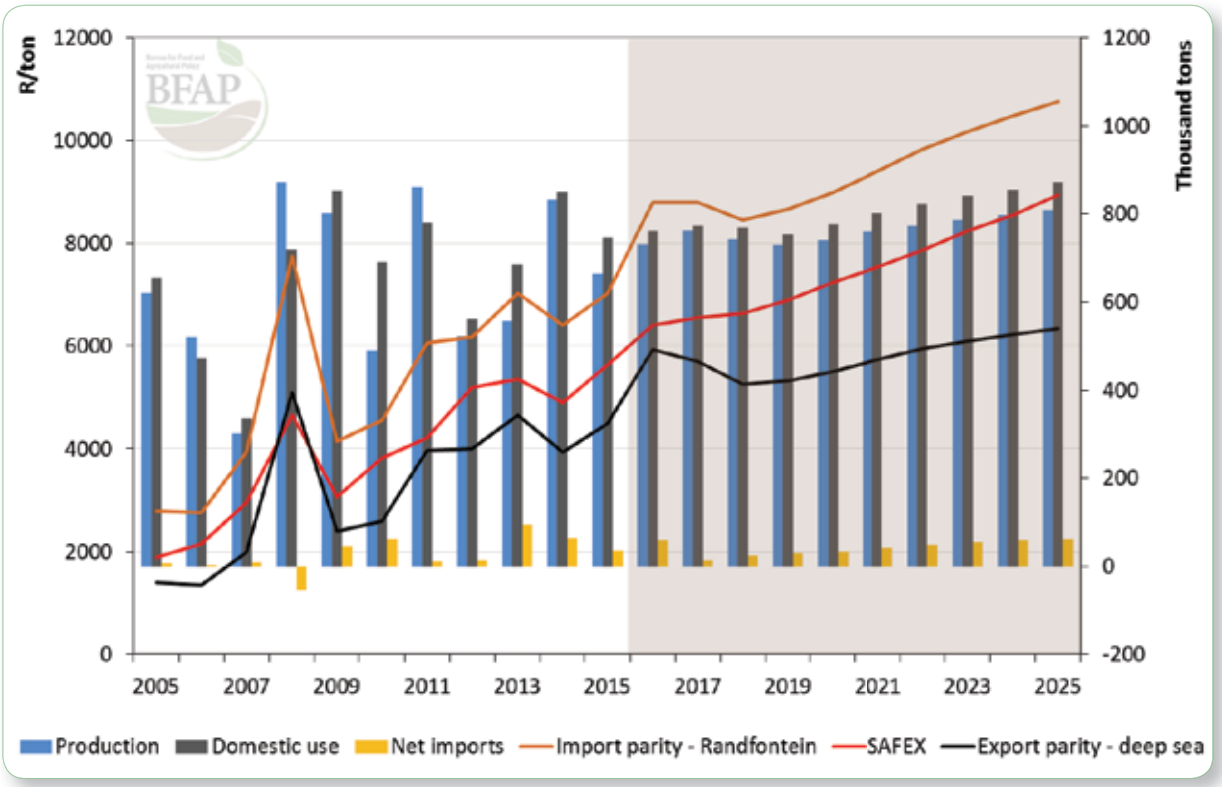


Figure 54: *Sunflower production, use, trade and prices: 2005 – 2025*

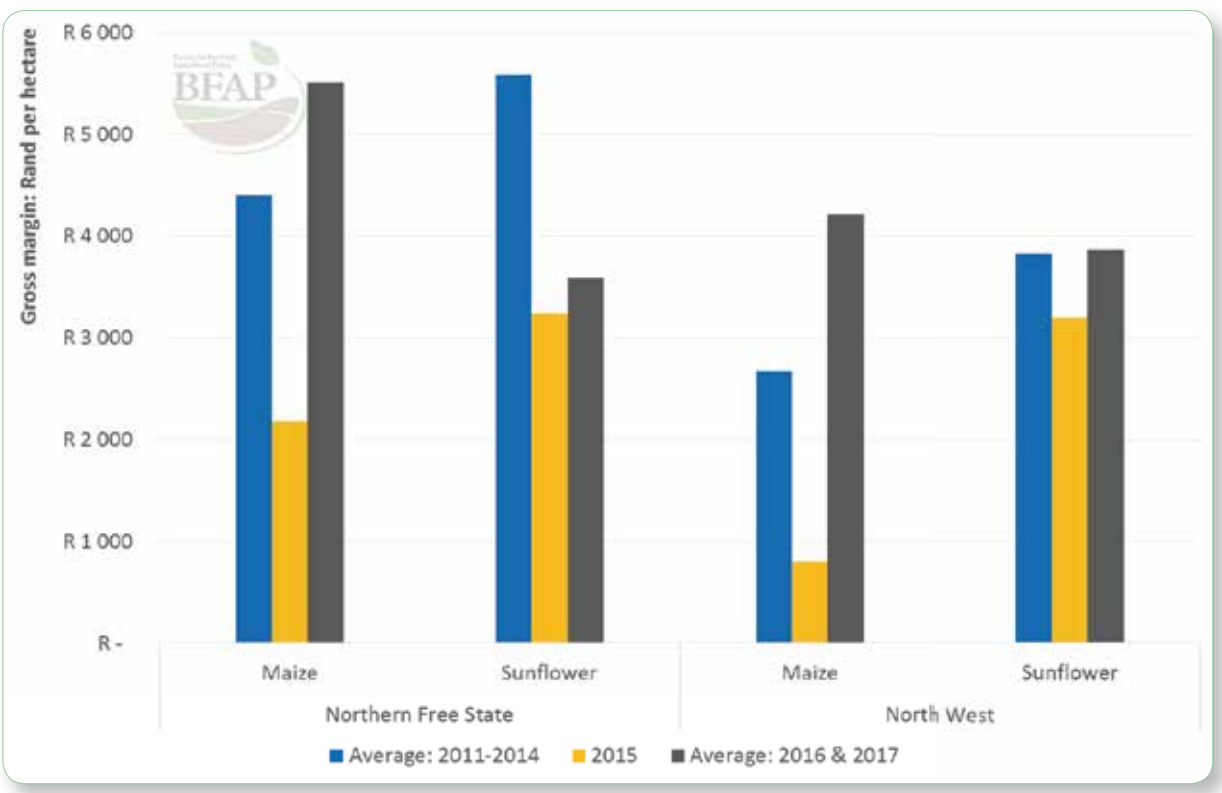


Figure 55: *Gross margins for maize & sunflower in Northern Free State and North West*
Source: NWK, Senwes & BFAP calculations, 2016

Similar to sunflowers, canola also maintains reasonable performance in drought conditions, evident particularly in the Swartland region where yields did not decrease to the same extent as alternative winter grains in 2015. The average canola yield in 2015 was 1.25 tons per hectare, only a 2% decrease from the 2014 average. Given the slight decline in hectares, canola production decreased to just under 98 thousand tons for the 2015 season. However, in 2016, a firm increase of 20% in yields resulting from a return to improved weather conditions is expected to off-set a further decrease in canola area and result in an estimated production of 102 thousand tons.

Given the competition for area from grains such as wheat and barley, the single largest off-taker of canola in South Africa, Southern Oil (Pty) Ltd (SOILL), is currently working towards announcing a daily mill door price (a SAFEX producer price equivalent), which will improve information to producers. Meanwhile, a price calculation formula is still in use, implying a back-payment option on prices, which remains popular amongst producers. The canola price is derived from soya bean and sunflower by-products and the canola import parity price of which the crushing costs, area differential and handling costs are subtracted; storage and financing costs remain unaccounted for in the calculation. SOILL is expecting to crush 128 thousand tons of canola in 2016 and BFAP projections (Figure 56) show that the canola market will maintain a fine balance going forward. Production and crushing demand are projected to increase to 230 and 210 thousand tons respectively by 2025. The canola price is expected to continue trading close to the sunflower price, resulting in an increase of 14% in 2016. Over the outlook period the canola price is projected to shift away from export parity, creating the incentive for producers to increase area at the expense of wheat.

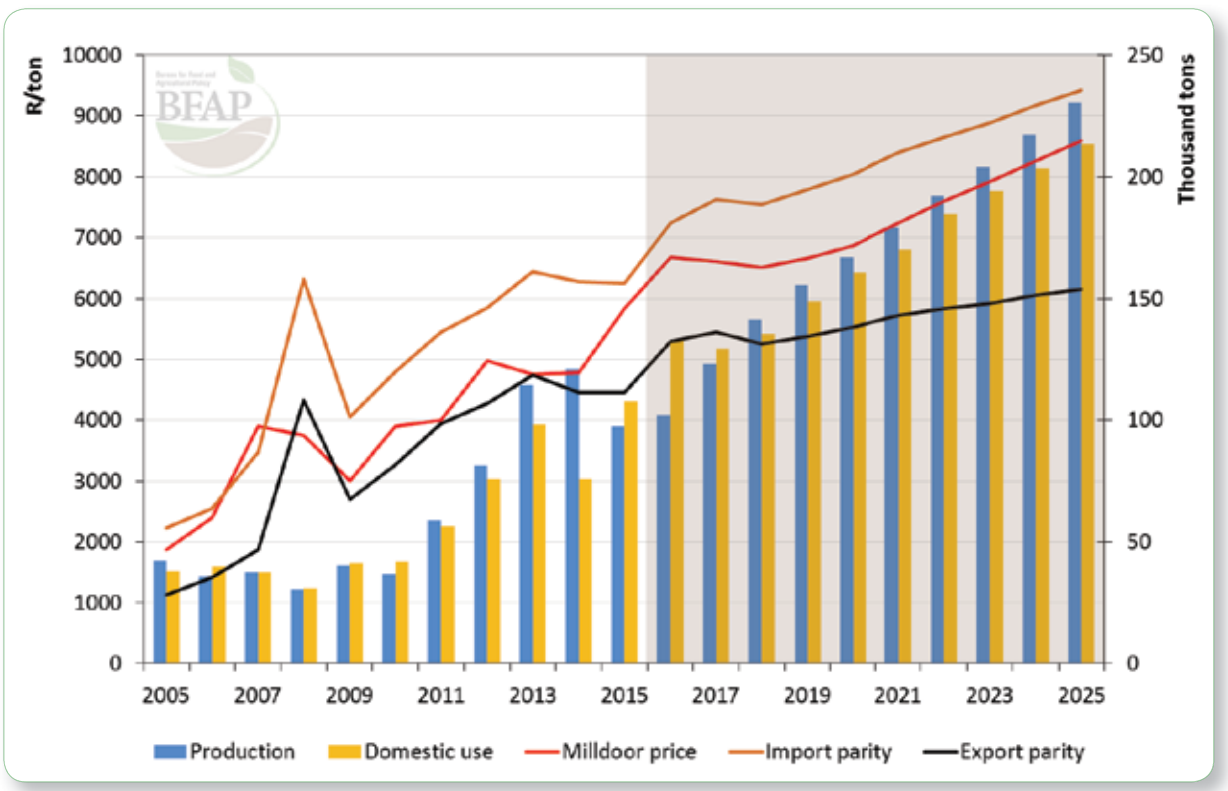


Figure 56: *Canola production, consumption and prices: 2005 - 2025*

Global oilcake situation and trends

In recent years, continued growth in demand for protein meal (oilcake) has been a key driver behind increased oilseed production. Global soya bean crushing demand is projected to increase at a slower rate in the coming decade due to slower growth in livestock production and saturated Chinese feed rations. Soya bean crushing demand is expected to increase by 4% per annum, while growth in crushing demand for other oilseeds is expected to be even slower. Canola crushing in particular is forecast to decline for the 2016 season due to reduced seed production. By 2025, it is estimated that 90% of the world's soya bean production and 84% of other oilseed production will be crushed. Over the outlook period, an increasing portion of global oilcake demand is projected to be supplied through trade as oilseed production becomes increasingly concentrated.

Sunflower, soya bean and canola oilcake prices not only reflect the reality of product substitutability, but are also influenced by the cost of other major livestock feed ingredients. In line with oilseeds, oilcake prices have declined recently, reaching levels close to the historic average over the past decade. Comparing to other important feed ingredients, the prices of oilcakes are currently trading at 1.5 to 2 times that of maize. Prices are expected to bottom out in 2016 before recovering gradually in response to rising feed demand.

Domestic oilcake situation and trends

The demand for soya bean oilcake is primarily driven by the feed industry. This is particularly true for soya bean oilcake, since it has the highest protein content. Given the reduction in domestically produced soya beans in 2016, oilcake production is expected to decline to just under 700 thousand tons (13%), before rebounding to more than 900 thousand tons in 2017. Over the outlook, domestic production of soya bean cake is projected to expand rapidly, continuously replacing imported products and by 2025, domestic production is projected to exceed 1.6 million tons. Towards the end of the outlook, soya bean oilcake imports will have decreased to less than 200 thousand tons. With domestic production insufficient to fulfil total demand, prices continue to trade in line with import parity trends over the outlook. Historically, domestically produced oilcake traded at a discount to imported oilcake due to technical challenges and resulting inconsistencies in protein content. The domestic crushing industry however made significant progress in reducing such inconsistencies over the past two years and as utilisation rates and soya bean availability improves, these inconsistencies, as well as the associated discount is continually reduced. In some cases, products are already trading at import parity owing to product quality and consistency being in line with imported products on a continuous basis.

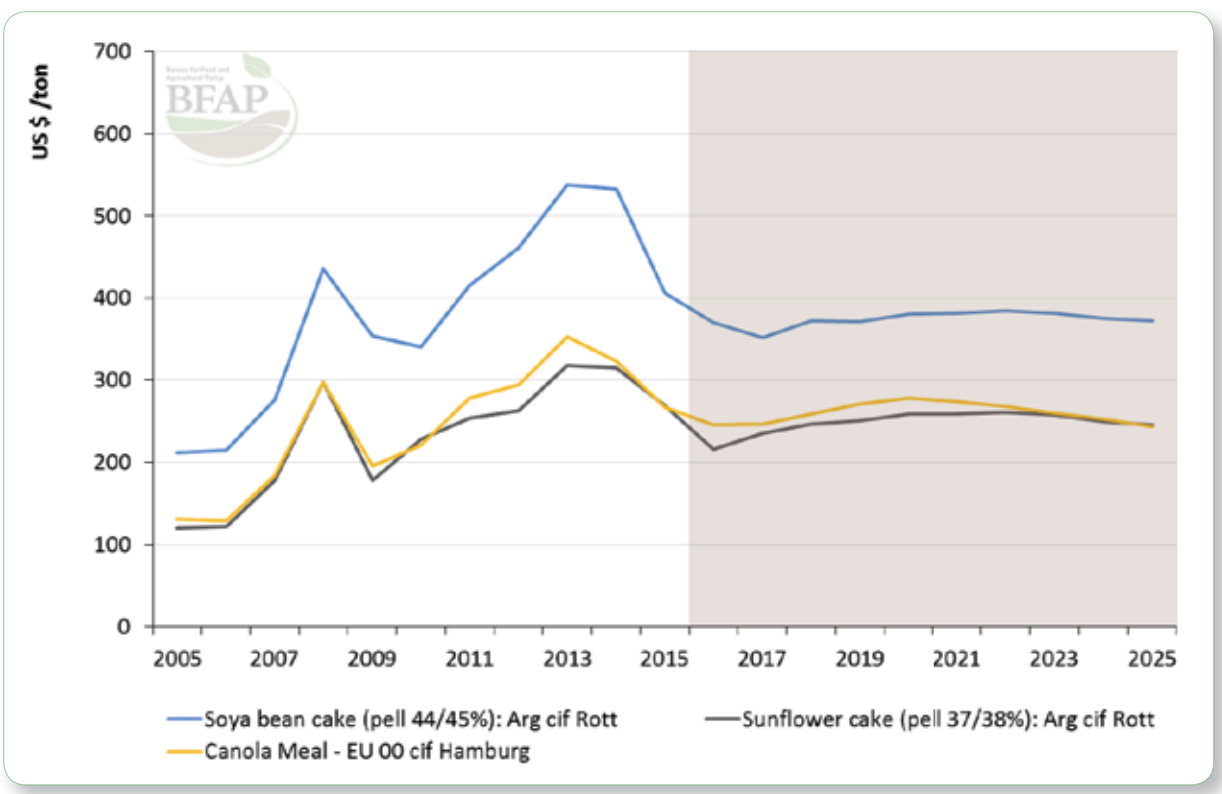


Figure 57: *International oilcake prices: 2005-2025*
Source: FAPRI & BFAP, 2016

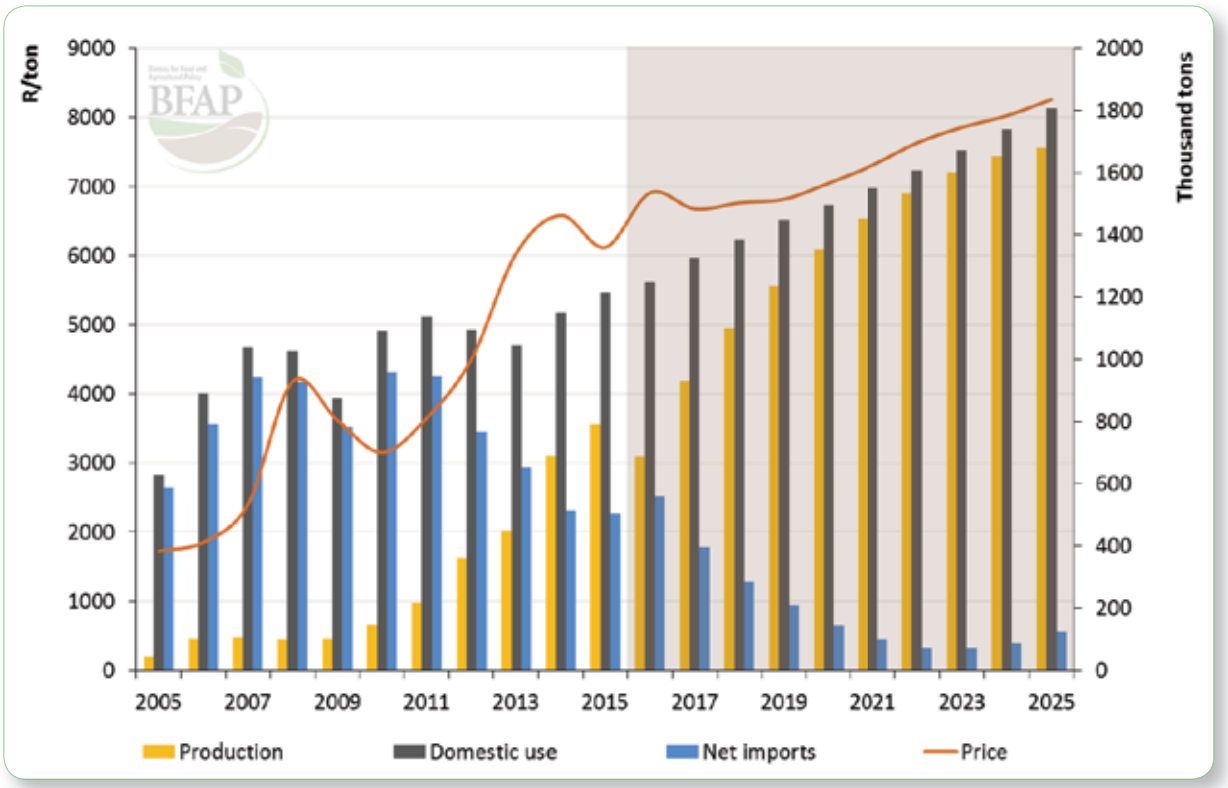


Figure 58: *Soya bean oilcake production, consumption, trade and price: 2005-2025*

The bulk of domestic sunflower seed production is crushed to produce sunflower oil and oilcake. Similar to sunflower seed, oilcake production is projected to increase marginally from 315 thousand in 2016 to just over 360 thousand tons by 2025. Additional growth in demand will need to be supplied through imports. Imports of sunflower oilcake are projected to decline over the outlook, from more than 100 thousand tons in 2016 to approximately 60 thousand tons by 2025. Similar to soya bean oilcake, the sunflower cake price increases in line with import parity over the outlook period.

The canola price also increases with import parity over the baseline period. Given that SOILL, as the single largest off taker of canola in South Africa, strives to incentivise canola production in order to optimise crushing capacity, oilcake production increases in line with canola production. On average, canola oilcake has the lowest protein content amongst the major oilcakes at 34% and hence soya bean meal (up to 48% protein) is generally preferred for intensive livestock production. It has however been used successfully in the dairy industry and with production projected to expand by almost 50 thousand tons over the next decade, dairy farms in the Western Cape will represent the bulk of the canola oilcake market.

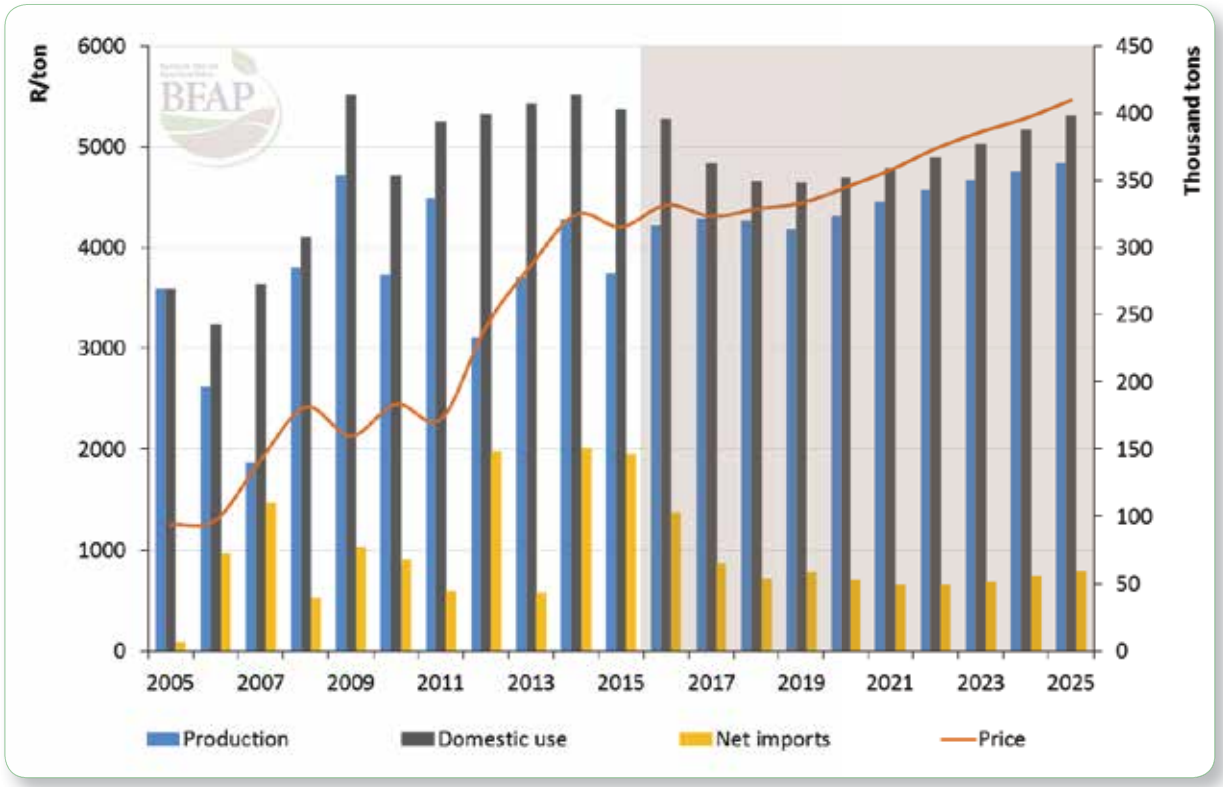


Figure 59: *Sunflower oilcake production, use, trade and price: 2015 - 2025*

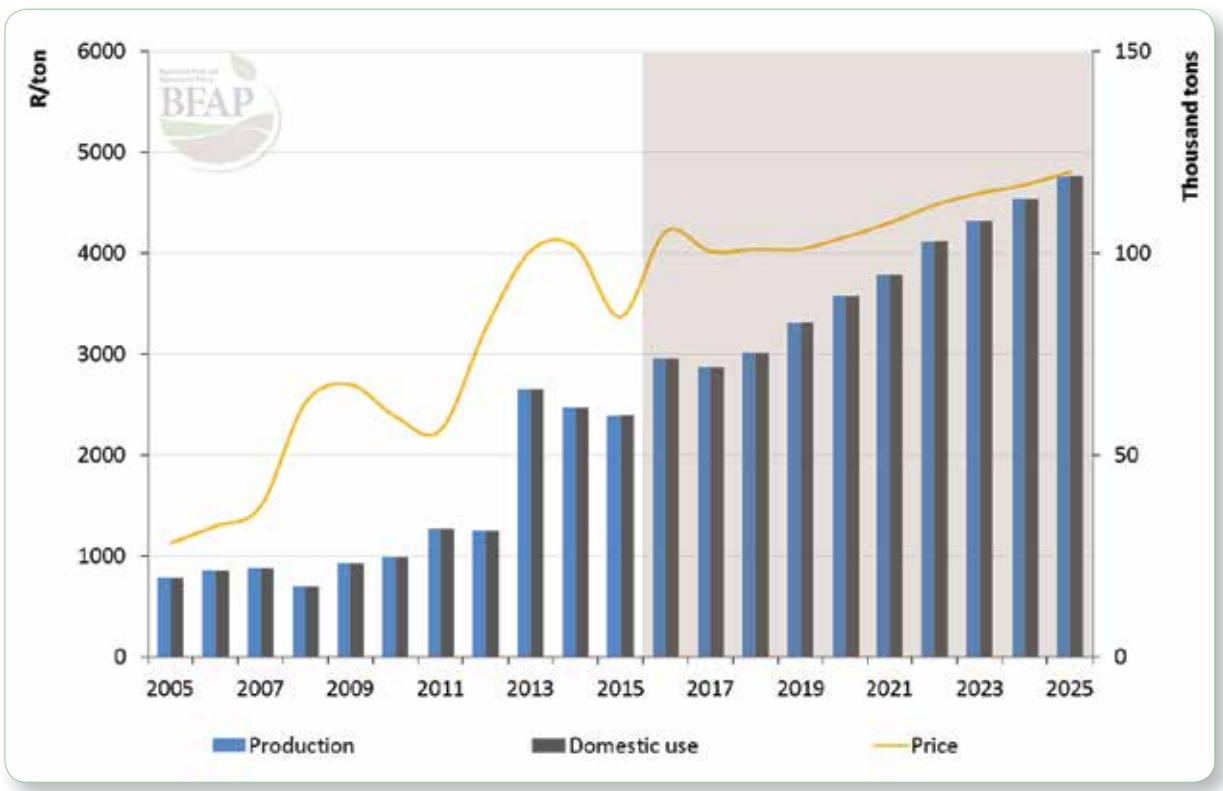


Figure 60: *Canola oilcake production, consumption and price: 2005 - 2025*

Global vegetable oil situation and trends

For several years, global vegetable oil production has increased at a slower rate than oilseed production. This is due to the increasing share of soya beans in the oilseed market, which represents a lower oil yield, as well as reduced palm oil yields in South-east Asia on account of El Nino related weather conditions. At the same time, demand for vegetable oil has slowed following a decrease in bio-diesel production in a number of developed and developing countries. Net exports of soya bean oil in particular are expected to decline due to expanding Diesel mandates in Brazil and tightening soya bean supplies in Argentina.

Within the vegetable oil complex, crude oil has tended to provide a price floor due to the flexibility in producing biofuel from vegetable oils. Thus at lower crude oil prices, nominal vegetable oil prices have fallen sharply to levels last seen in 2006. In light of the stagnation in production levels, vegetable oil prices are expected to recover first within the oilseed complex. As a result of rising high oleic soya bean production in the US, soya oil prices are projected to become more competitive relative to palm oil prices. Nonetheless palm oil remains the least expensive vegetable oil over the outlook period.

Domestic vegetable oil situation and trends

The sharp decline in international vegetable oil prices also caused domestic prices to trade softer until 2015. In light of substantial exchange rate depreciation, combined with the expected bottoming out of international prices in 2016/2017, domestic vegetable oil prices are expected to increase in 2016 to R12 942, R15 610 and R13 303 per ton of soya bean, sunflower and canola oil respectively (Figure 62). South Africa remains a net importer of vegetable oils and therefore domestic vegetable oil prices continue to trade in line with import parity levels. As such, volatility will to a large extent be driven by international price movements and exchange rate fluctuations.

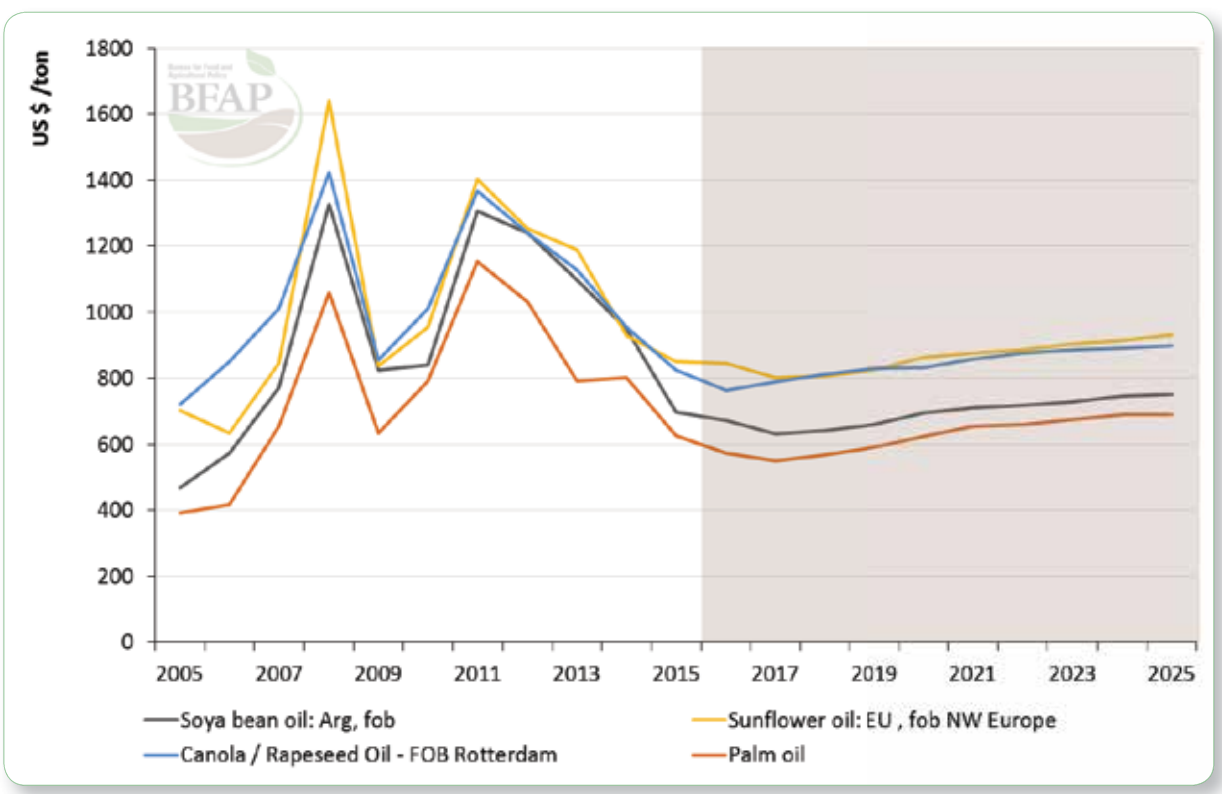


Figure 61: *International vegetable oil prices: 2005-2025*

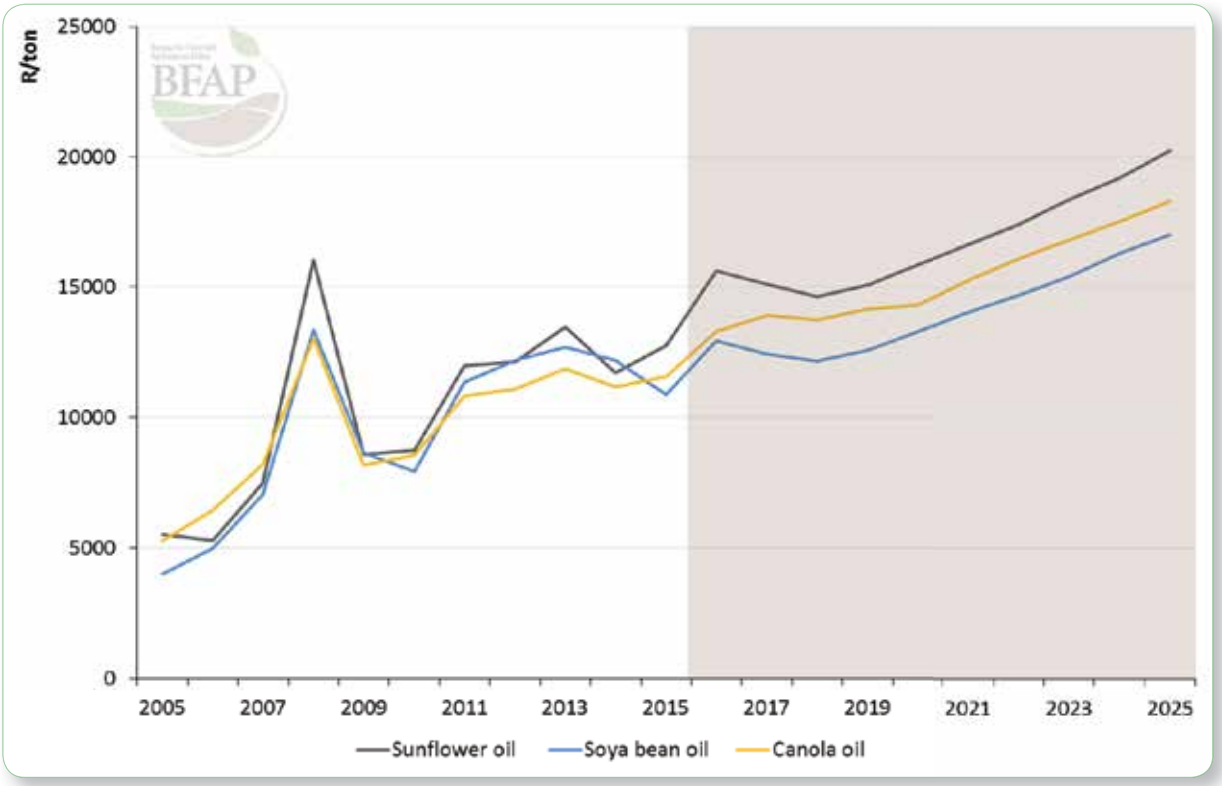


Figure 62: *Domestic vegetable oil prices: 2005-2025*

Domestic production of vegetable oils is projected to decrease marginally in 2016 relative to 2015, in line with the decrease in oilseed production and resultant crushing volumes. In years of substantial reductions in oilseed production, it is often more cost competitive to import crude oil than to crush imported oilseeds, which has led to volatile vegetable oil production in recent years. Over the outlook period vegetable oil production is projected to increase by an annual average of 2.2% (Figure 63). Furthermore, as soya bean production and crushing expands the share of soya bean oil in domestically produced vegetable oil increases at the expense of sunflower oil over the outlook period. The share of canola in domestically produced vegetable oil remains fairly constant around 10%.

Domestic consumption of palm oil has increased rapidly over the past decade, due to its favourable trans-fat characteristics and competitive price relative to alternative vegetable oils. Combined consumption of palm, sunflower, soya and canola oil is estimated at more than 1 million tons in 2015, of which palm oil comprised approximately 39%. South Africans are traditionally partial to sunflower oil as opposed to soya bean oil which is widely used in the U.S. based on consumer tastes and preferences. In the US, high oleic soya oil has the same favourable trans-fat characteristics that allow it to compete with palm oil and being a net exporter of soya oil as opposed to a net importer of palm oil, soya oil tends to be more competitive as frying oil in particular. In South Africa however, which is a net importer of all vegetable oils, palm oil represents a less costly option, making it popular as frying oil in the fast food industry in particular. In 2015, palm oil comprised half of total vegetable oil imports into South Africa.

Canola oil is currently still marketed as a niche product in South African supermarkets, mainly due to the small volume produced domestically, as well as its favourable qualities as household cooking oil, since it has the lowest saturated fat content of all vegetable oils. Apart from its consumption as oil and oil blends (such as the canola olive oil blend), canola is also processed into margarine and mayonnaise. Domestic consumption of canola oil is projected to increase from 51.7 thousand tons in 2016 to just over 85 thousand tons in 2025 (Figure 64).

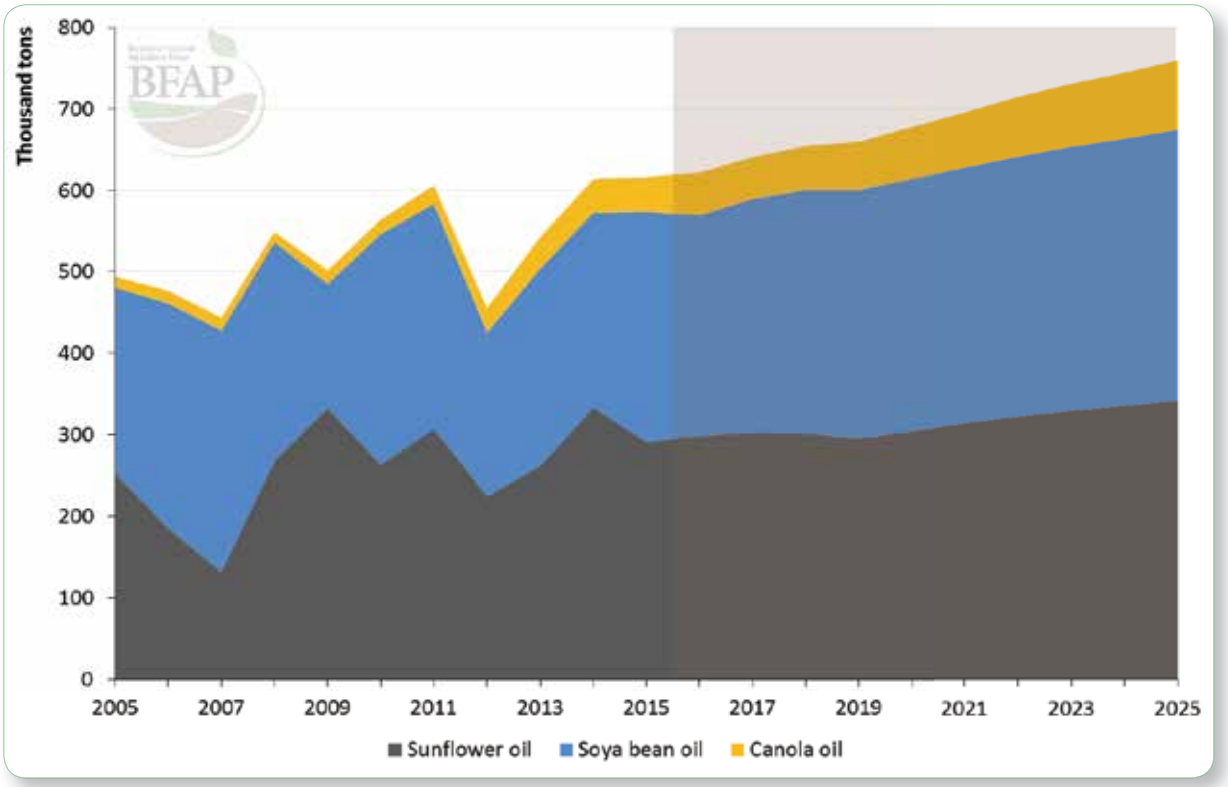


Figure 63: *Vegetable oil production in South Africa: 2005-2025*

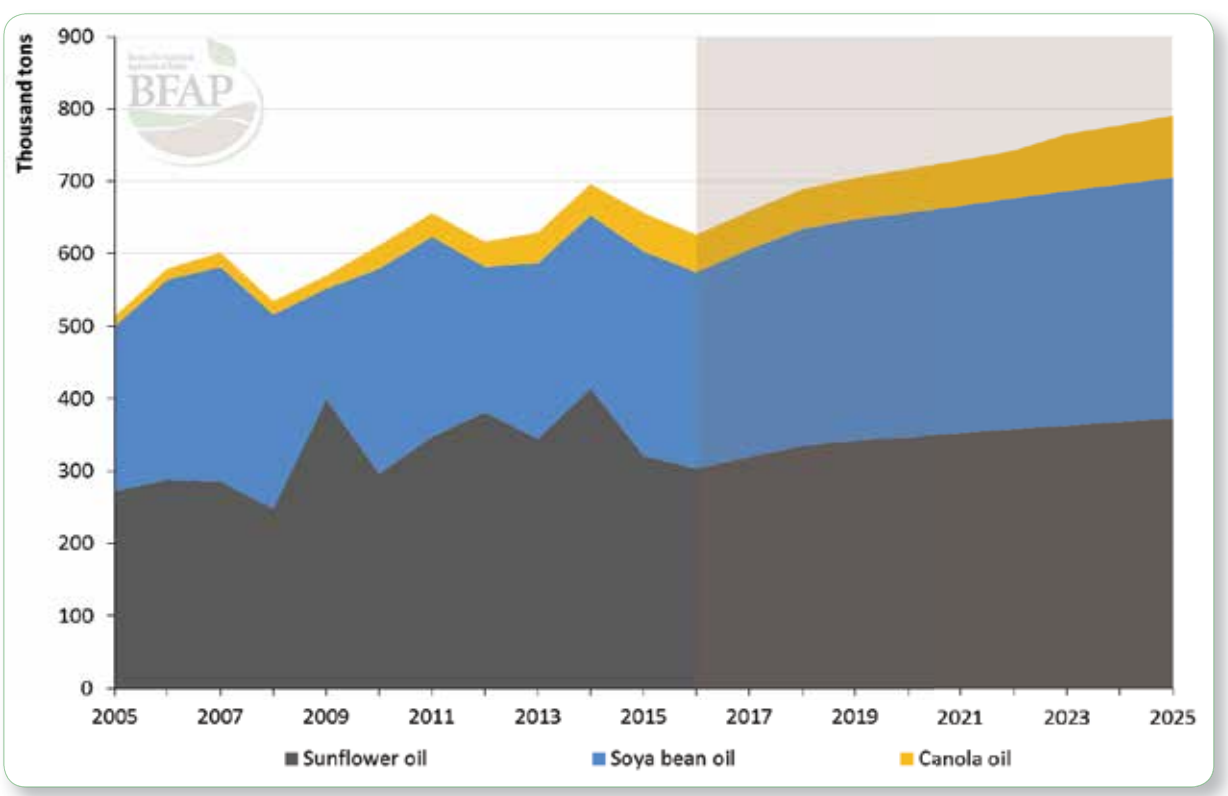


Figure 64: *Vegetable oil use in South Africa: 2005-2025*

The increase in oilseed and vegetable oil production is projected to offset a large share of the soya bean and canola oil imports over the next decade (Figure 65). Soya oil imports are projected to decrease from 187 thousand tons in 2015 to merely 36 thousand tons by 2025, whereas canola oil imports decline from 10 thousand tons in 2015 to under 1 thousand tons by 2025. By contrast, sunflower oil imports are projected to remain fairly constant around 30 thousand tons over the coming decade. Since palm oil is not produced locally, it is sourced from Malaysia and Indonesia and all consumption growth over the next decade will be imported. Being the cheapest option on the international market, palm oil use and consequently imports is expected to increase consistently over the next decade.

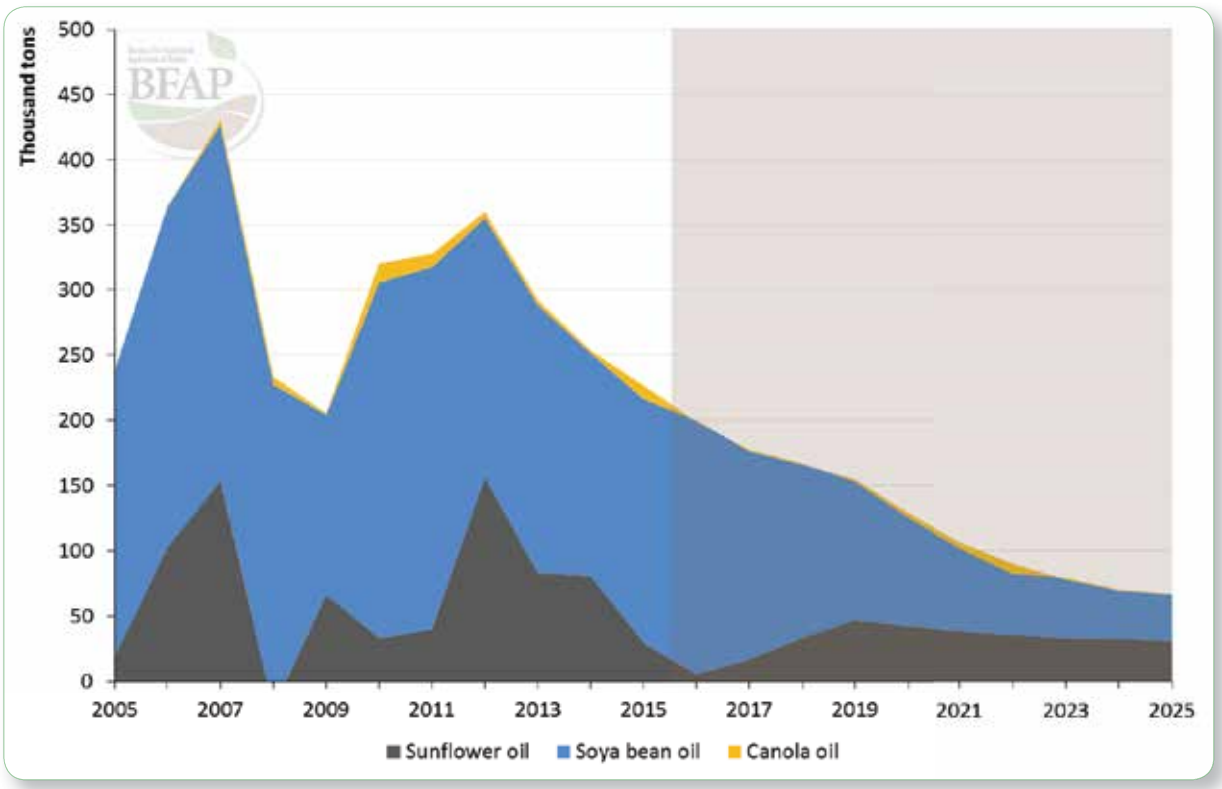


Figure 65: *Net trade of vegetable oil: 2005-2025*

SOUTH AFRICAN OUTLOOK

Outlook for field crops

SUGARCANE AND SUGAR

For the past decade the South African sugar industry has been grappling to come to terms with much tighter profit margins, mainly due to stagnant and in some areas even declining yields, combined with rising input costs. In addition the industry has been faced with consecutive seasons of below average rainfall.

FOR THE PAST DECADE the South African sugar industry has been grappling to come to terms with much tighter profit margins, mainly due to stagnant and in some areas even declining yields, combined with rising input costs. In addition the industry has been faced with consecutive seasons of below average rainfall. Recorded 2015 and 2016, rainfall has fallen well below long term average levels but even though 2016 has been drier, it seems the distribution in sugarcane producing regions has been slightly better than in 2015. Being the second consecutive season, the severity of the drought has still impacted heavily on yield levels and consequently, total cane production is projected to drop to 14.2 million tons in 2016, compared to 14.7 million tons in 2015 and 17.7 million tons in 2014.

The financial position of the industry has resulted in a large number of seasonal farm workers not being employed in the 2015/16 and 2016/17 seasons. The drought comes at a time where a number of mills have already been struggling with lower throughput and consequently lower profit margins for several years. As a result, the Umzimkulu Mill and the Amatikulu Mill have both been moth balled for the 2016/17 season, with a good chance that neither of the two will open during the season. In 2015, the Darnall and Umzimkulu mills did not open.

It is projected that the area in cane will remain relatively stable over the outlook period. Industry experts argue that most of the land with marginal production potential has already fallen out of production and although the number of growers may continue to consolidate as the average farm size continues to expand, no further drastic shifts in the area under production is projected under the baseline assumptions. The financial position of growers is however likely to impact on the number of farms for sale and some cane area could make place for alternatives if larger farmers choose to diversify. The baseline further assumes relatively normal rainfall conditions and when these return it is expected that production will recover to levels of around 18 million tons of cane and consequently more than 2 million tons of sugar over the baseline period. Since this increase in production is likely to come from the lower base of hectares, yields are anticipated to increase gradually over time, in line with a progressive recovery from the drought.

No exports are expected in the current marketing season, due to the domestic shortage arising from the drought. Over the baseline, exports of sugar are expected to return to historic norms, averaging around 500 thousand tons. Nonetheless, the industry will face continued pressure from imports as the global market remains in over supply. The pricing mechanism of sugar remains the main reason for rising competition from imports. The sugar act enables the industry to set the RV price based on the revenue earned, while competition in the market place impact on the final selling price of sugar. The internal transfer

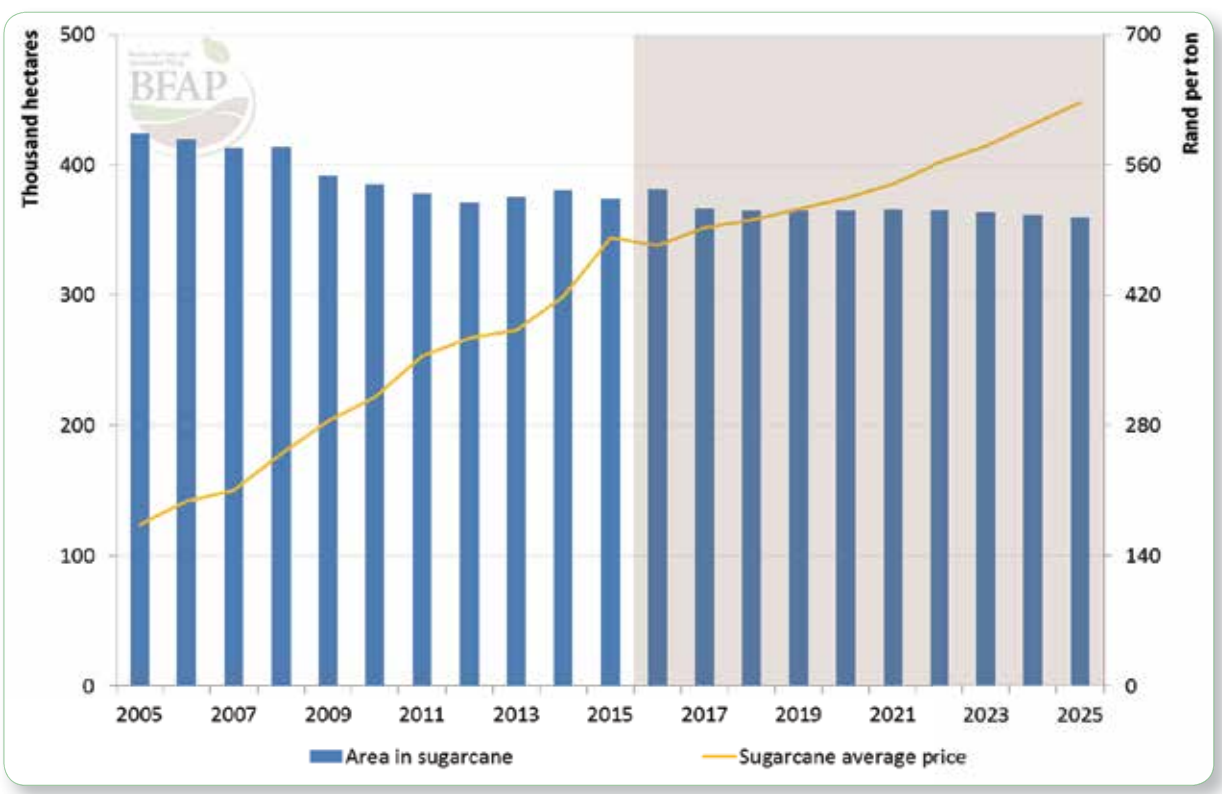


Figure 66: *Sugarcane area and price: 2005-2025*

price generally increases at an inflationary rate. This trend will likely expose the industry to the low world market prices in the future.

In 2015/16, world market prices have hit their lowest levels in 6 years as a result of high world market stock levels. While prospects of a production deficit in the current season have induced a recovery in recent months, stock levels remain high and despite the recent increase, prices remain low relative to the levels of the past 6 years. The situation in the EU is similar and the low prices there have resulted in SADC sugar producers searching for alternatives. At this stage it seems likely that the SACU market will also be exposed to the SADC sugar producers, which in turn could displace more SA sugar onto the world market. It is however expected that the current low world prices will impact on the viability of sugar production on the world market, reducing production over the coming seasons.

The industry is currently reviewing a number of its processes and planning strategic interventions to bring sustainability back into the production and processing of sugarcane and sugar. At this stage it seems that there is little interest from government to entertain a review of the sugar industry legislation and at this point, bioethanol and cogeneration of electricity seem to be on hold due to the perceived expense to the fiscus. The sugar industry is considering alternative methods of becoming sustainable and these are largely linked to more efficient production practices, effective and efficient control of the Eldana pest and alternative by-product production practices.

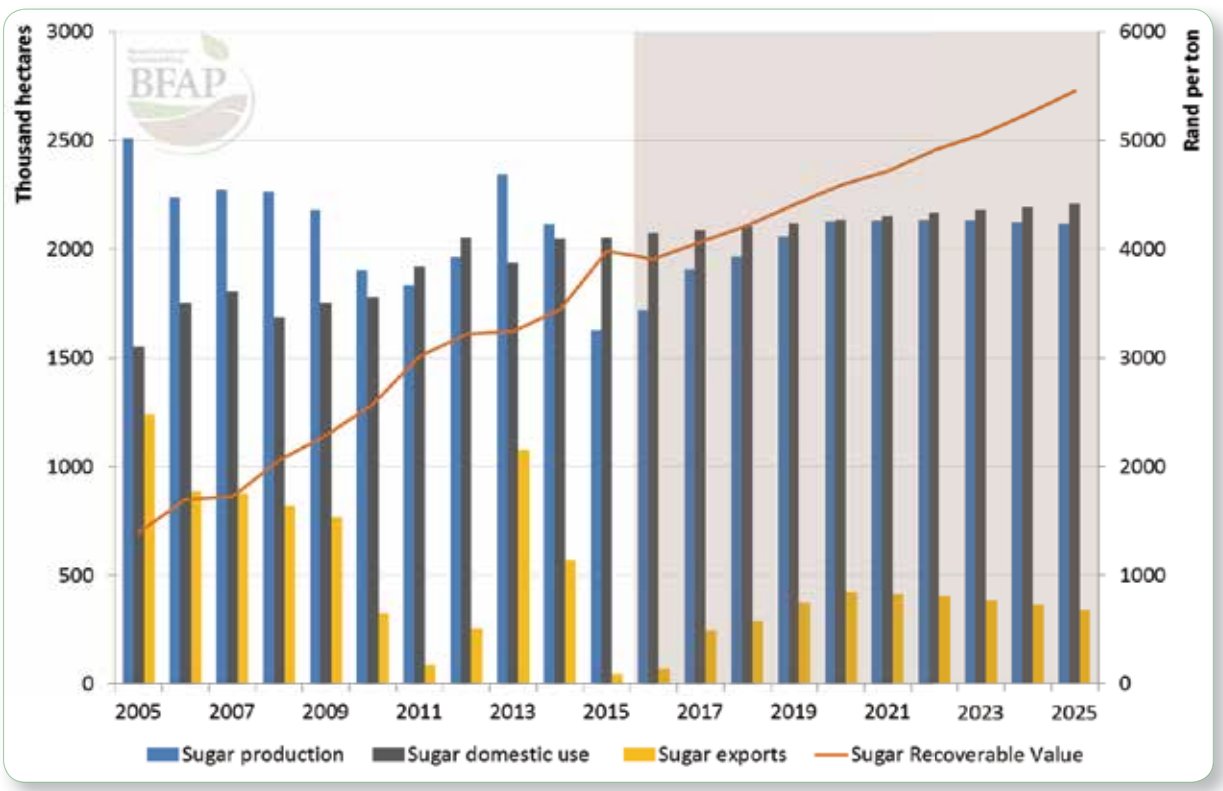


Figure 67: *Sugar production, consumption and the RV price: 2005-2025*

Box 7.1: Exploring the potential implications of a sugar tax on the South African sugar industry

Non-communicable diseases (NCDs) such as heart disease, stroke, cancer, diabetes and chronic respiratory disease are on the rise in low- and middle-income countries (including South Africa), accounting for more than two-thirds of global deaths. This is driven by risk factors such as unhealthy diets, obesity, tobacco use and inadequate physical activity. From a dietary perspective, pertinent issues relate to the shift from traditional diets to 'western' diets which tend to be more energy dense and involve more processed foods, foods of animal origin, added sugar, added salt and fat (Spires et al., 2016). The rise in NCDs raises question marks in terms of consumers' knowledge and attitudes towards healthy food choices and lifestyles; as well as their subsequent behaviour and food choices. Spires et al. (2016) concludes that in order to improve dietary patterns and reduce chronic diseases in South Africa, there is a need for sustained public health efforts aimed at reducing the intake of unhealthy foods and to improve the availability, affordability and acceptability of healthy foods.

From a policy action perspective one option could be taxation of unhealthy foods – aimed at reducing intake and simultaneously generating government income to cope with the expenses associated with NCD's within the health system. Internationally several countries, including several US states, France, Mexico, Denmark, Finland, Hungary, Ireland, Mexico and Norway have implemented a sugar tax, mainly on sugar sweetened beverages (SSBs). SSBs could include soft drinks, fruit juices, sports drinks, energy drinks, vitamin waters, sweetened ice tea, lemonade, cordials and squashes, all with added sugar. In many countries the reduction in sugar intake was found to be proportionally less than the taxation rate, which could be attributed to factors such as businesses absorbing the tax, consumers liking the taxed foods so much that they do not reduce intake and rather pay more, consumers replacing the taxed food containing sugar with other unhealthy choices such as alcohol or high calorie foods (Institute for Economic Affairs, 2016). If the reduction in intake is not significant, such a tax could be viewed as one more thing adding pressure to consumers' food budgets, which are already under severe pressure given high food inflation in South Africa. Some experts argue that comprehensive consumer education on healthy food choices and lifestyles could be significantly more effective than levying a tax.

In the 2016 budget speech the Finance Minister announced that a sugar tax will be levied with effect from 1 April 2017. The policy paper published for comments by Treasury on 8 July 2016, proposes a 2.29 cents per gram of sugar tax on sugar in SSB. This equates to more or less a 20% tax on the most popular soft drink, Coca Cola. This would also mean that a tax of R22 900 is levied on a ton of sugar in SSB, i.e. almost 250% the current price of the sugar.

It is estimated that between 12 and 15 percent of the sugar produced in South Africa is sold to beverage producing companies. The price formation mechanism in the sugar industry, which is based on the Recoverable Value and the cost of producing a unit of cane, implies that a decrease in the local demand for sugar will not impact on the sugar price. Instead it will influence the size of the devisable income pool as more sugar will have to be exported at the lower (than domestic) world price. While the fruit juice industry (100% fruit juice or no-sugar-added products are excluded from the taxed) could potentially benefit from a tax on soft drinks, a decrease in the demand for SSB will negatively impact the already beleaguered sugar industry and the farmers, labourers and rural economies who depend on it for a living.

SOUTH AFRICAN OUTLOOK

Outlook for animal products

MEAT AND EGGS

Globally the evolution of feed grain prices over the past three years has introduced stability into the livestock sector, which had been operating in an environment of particularly high and volatile feed costs over most of the past decade. However South African producers have been denied the same benefit by a combination of domestic weather conditions and currency depreciation.

Meat – global

After an extended period of upward trending, though at times volatile global meat prices, the FAO Meat price index peaked in mid-2014 and has declined by more than 25% since. In the first quarter of 2016, the index reached levels last observed in early 2010, reflecting weaker demand from emerging economies and a slowdown in trade volumes. Despite lower prices, profitability remains supported by persistently low feed grain prices and beef herd numbers are expanding in the US, India and Brazil. Low feed prices also support higher carcass weights and in the US alone, beef production is expected 5% higher in 2016. Weaker currency is expected to support a significant production and trade rebound in Brazil. Poultry production continues to expand in most major exporting countries, with pork representing the only meat product where production is expected to contract in 2016. Much of this decline is attributed to the EU and particularly China, where demand has slowed on the back of the economic slowdown and repercussions from more stringent environmental regulations challenge further expansion of pork production.

Given that feed grain prices are expected to remain lower in the medium term, the OECD-FAO projects global meat production to expand by 16% over the next decade. Following a period of herd liquidation, beef production is set to recover over the outlook, expanding by 14% by 2025, however poultry production continues to account for the greatest share of meat production growth over the outlook. As a more affordable source of protein relative to red meats, demand for poultry is expected to remain firm, particularly in developing regions where rapid population growth and continued urbanisation remains the core drivers. This is particularly true in Africa where, albeit from a small base, demand for meat products is expected to grow faster than in any other region. A growing share of this demand is also expected to be imported. Whilst the share of trade in global meat markets is projected to increase by only 1% over the next decade, the OECD-FAO advocates that trade policies remain major drivers of the dynamics in global meat markets. Thus the implementation of various trade agreements over the outlook, such as the proposed Trans-Pacific Partnership (TPP) could increase and diversify meat trade.

Over the course of the next decade, beef prices are projected to continue the current downward cycle, as the impact of rising inventories becomes ever more evident in the market. Beef prices are projected to bottom out around 2020, where the cycle turns marginally upward once more in response to rising demand (Figure 68). Given the shorter production cycle and the consequently quicker supply response, the decline in pork and poultry prices was much sharper in 2015 relative to beef and are expected to bottom out sooner, returning to a marginally upward trend from 2017 onwards (Figure 68). Evident from the PEDv outbreak in the US in 2014, diseases can introduce meaningful supply shocks with clear price impacts and therefore remains one of the important uncertainties within global meat markets.

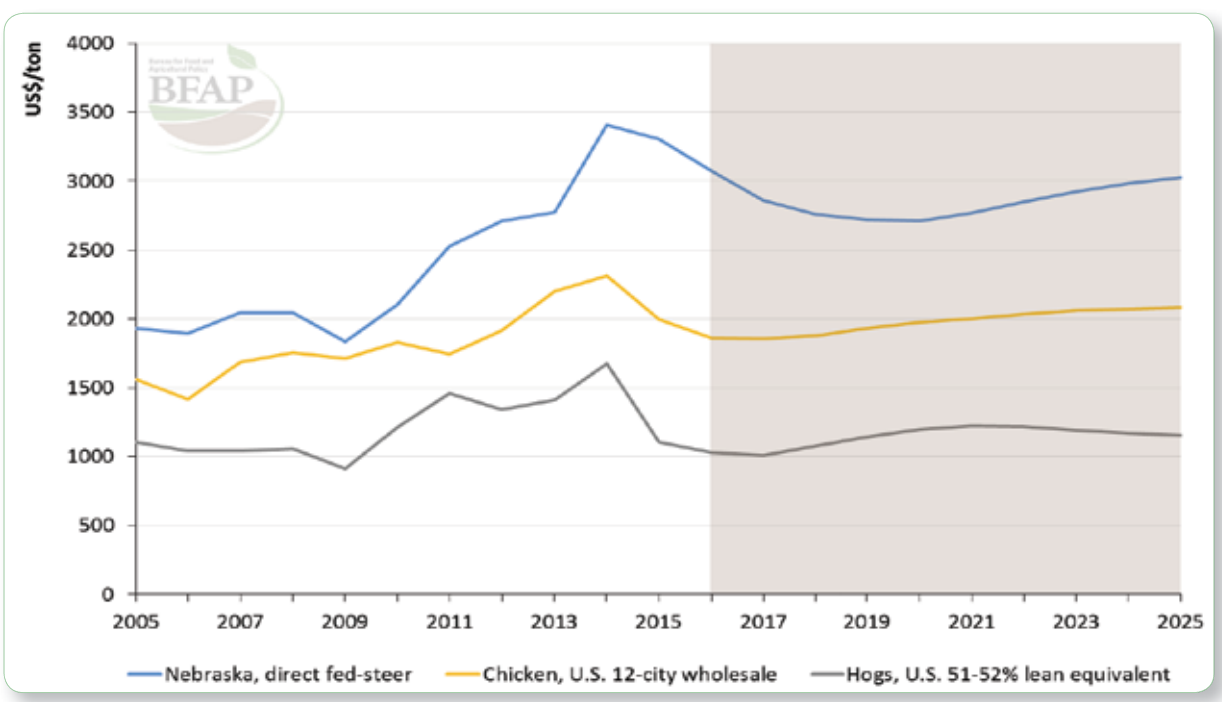


Figure 68: *World meat prices: 2005-2025*
Source: FAPRI & BFAP, 2016

Meat and eggs – South Africa

Over the past decade, meat consumption in South Africa expanded rapidly as a result of growing income levels, continued urbanisation, rising living standards and ever increasing dietary diversity. As the most affordable source of animal protein, poultry consumption in particular increased by almost 50%, compared to a 19% and 33% increase in beef and pork consumption respectively. Particularly in the short term, the outlook for income growth is much more reserved, resulting in significantly slower meat consumption growth in the coming decade relative to the past. This slowdown is already evident in the post-recession period and since 2010, consumption growth for chicken and beef has slowed considerably, with pork being the only meat type where consumption growth accelerated in the past five years relative to the 2005 to 2010 period.

Affordability being an important consideration in a slower income growth environment, chicken and pork consumption is also expected to outpace that of beef and sheep meat over the next ten years. Whilst slowing from the past decade, chicken consumption is projected to expand by 29% in the outlook period (Figure 69), equating to more than 500 thousand tons of additional chicken meat and almost 70% of additional meat consumed by 2025 relative to a 2013-2015 base period. Albeit from a small base, pork consumption growth in the coming decade accelerates from the past, expanding 37% by 2025 relative to the base period. By contrast, growth in beef consumption slows to 6% in the coming decade, from almost 19% over the past ten years (Figure 69). Much of this slowdown is attributed to the rapid decline in beef consumption over the next three years. Given the cautious outlook for income growth, consumer spending is expected to be under pressure, while at the same time supply limitations arising from herd liquidation through the current drought has pushed prices to record levels. Following this initial decline and as income growth recovers, beef consumption is projected to rise once more over the second half of the outlook period, to reach 13.5 kg per capita by 2025. This makes it the second most consumed animal protein following chicken (42kg per capita), with pork and sheep meat significantly lower at 5.2kg and 2.6kg per capita respectively. Eggs represent an important, affordable alternative protein source and domestic egg consumption is projected to expand by 17% over the coming decade, to exceed 8.5kg per capita by 2025.

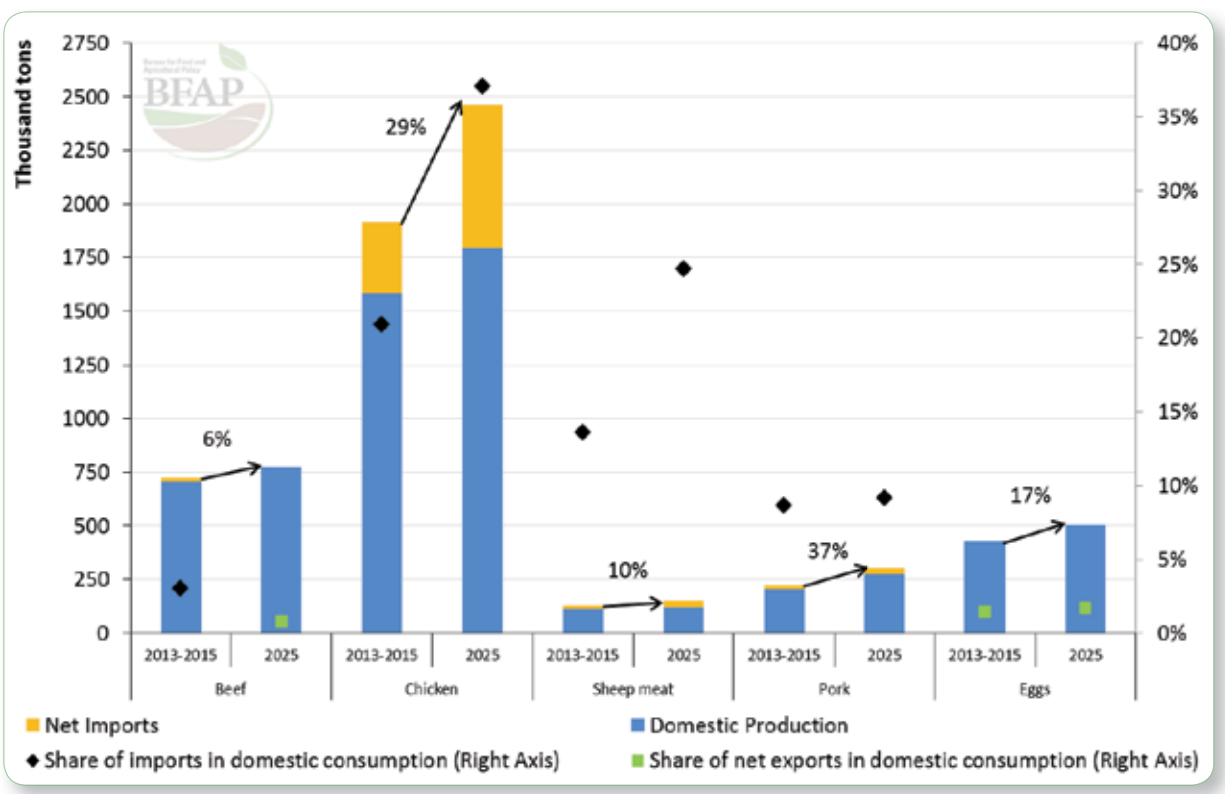


Figure 69: *SA meat consumption growth: 2025 vs. 2013-2015 base period*

The extent to which domestic production will need to be supplemented with imported products in order to meet demand growth will to a large extent be dependent on South African producers' profitability and how well they compete in the global context. Within the poultry sector, where meat to maize price ratios remain well below the global equivalent over the outlook (Figure 70), the share of imports in domestic consumption increases significantly towards 2025. By contrast, beef to maize ratios in South Africa compare well with the global equivalent for most of the outlook period and consequently by 2025, South Africa is projected to become a net exporter of beef, having been a net importer historically (Figure 69).

Globally the evolution of feed grain prices over the past three years has introduced stability into the livestock sector, which had been operating in an environment of particularly high and volatile feed costs over most of the past decade. However South African producers have been denied the same benefit by a combination of domestic weather conditions and currency depreciation. The impact of the drought differs across the various livestock subsectors, due to fundamental differences in price formation and feed use intensity. Furthermore the differences in production cycle length across industries govern the rate at which producers are able to respond to changes in profitability and therefore also the time horizon of the drought's effect.

While the impact on intensive industries such as pork and poultry has manifested through increased feed costs and consequent pressure on profitability, the impact on extensive livestock industries that depend on grazing has been more profound. Cattle slaughters in particular increased dramatically over the second half of 2015 and a survey conducted by the University of the Free State (UFS) for the Red Meat Producers Organisation (RPO) indicates that the national cow herd has declined by as much as 15% from 2013 levels. Figure 71 illustrates that the sharpest decline occurred in the North West and the Free State, where cow numbers in early 2016 had dropped by approximately 17% from 2015 levels. The four provinces presented alongside the national average in Figure 71 (Eastern Cape, Free State, KwaZulu-Natal and North West) account for more than 70% of the national cattle herd between them.

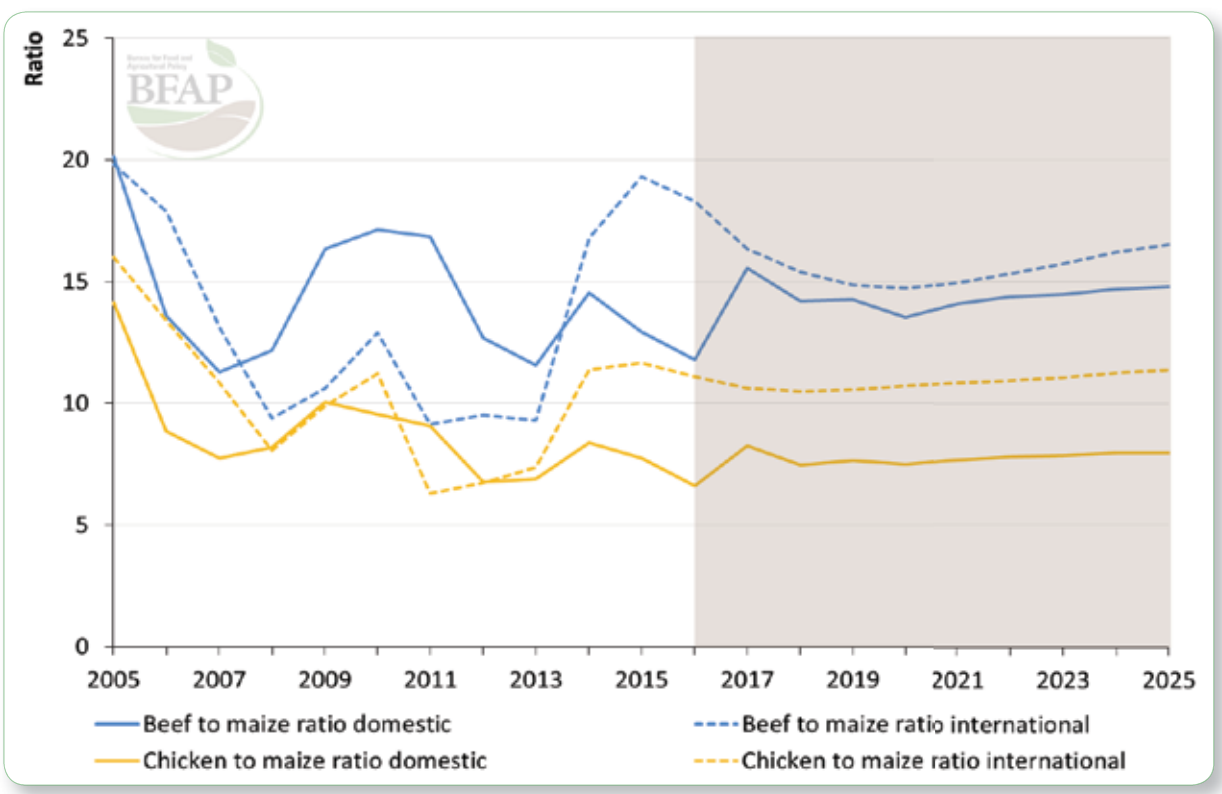


Figure 70: *Meat to maize price ratios: South Africa vs. United States: 2005-2025*
Source: FAPRI & BFAP, 2016

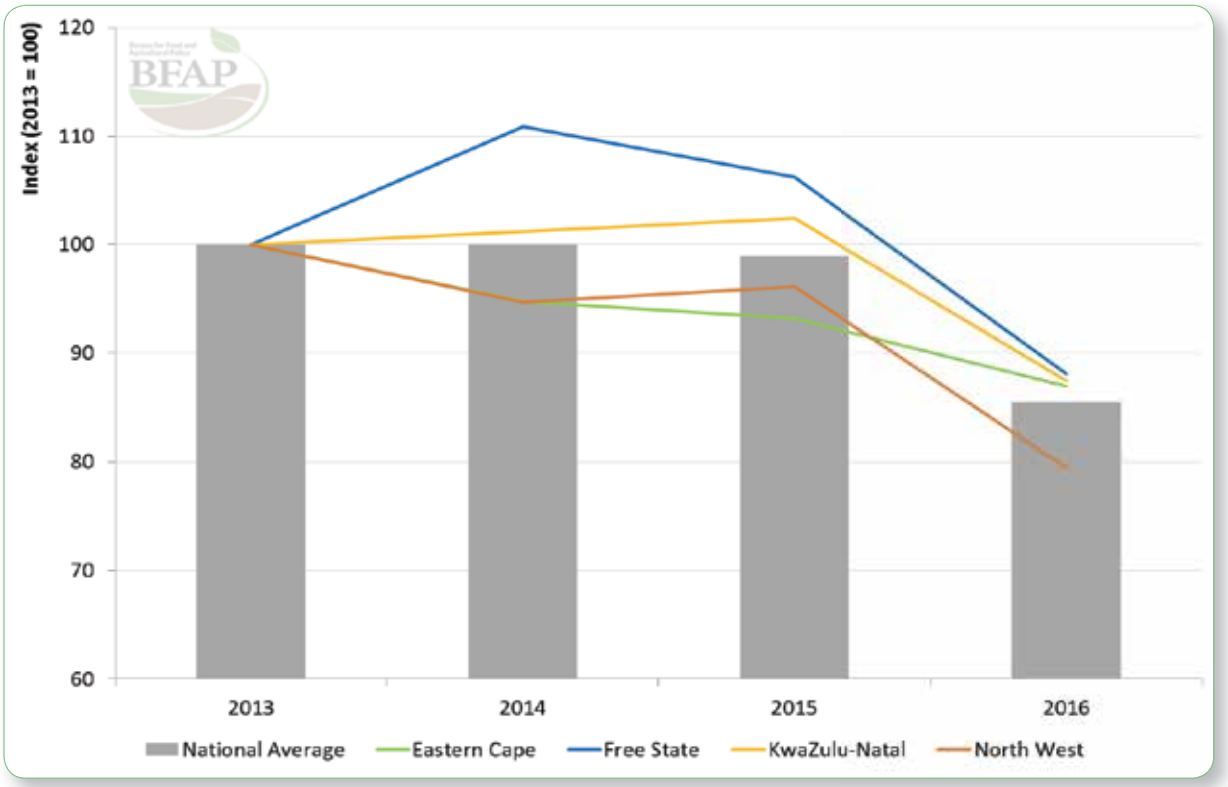


Figure 71: *Index of cow herd numbers: 2013-2016*
Source: University of the Free State and Red Meat Producers Organisation, 2016

At a national level, the survey further indicates that producers reduced the cow herd rather than the replacement heifer numbers (Figure 72), likely tending to slaughter older cows in order to preserve future productivity. Beef prices are largely determined through domestic supply and demand balances and traditionally, a situation such as the present where herd liquidation results in lower prices in the short term, before increasing at a later stage when herds are rebuilt. In light of rapidly rising export demand however, particularly high value cuts to the Middle East which allows producers to optimise carcass value (Box 8.1), prices have sustained well through the current drought. Export competitiveness has been further supported by high world prices combined with the depreciation in the exchange rate. The result was an increase of just over 4% in the average price for an A2/A3 carcass, despite an increase in commercial slaughter volumes of almost 9% year on year in 2015. In light of this structural break, a phase of herd rebuilding in response to improved weather conditions would induce a prolonged and sharp increase in domestic beef prices in the coming years.

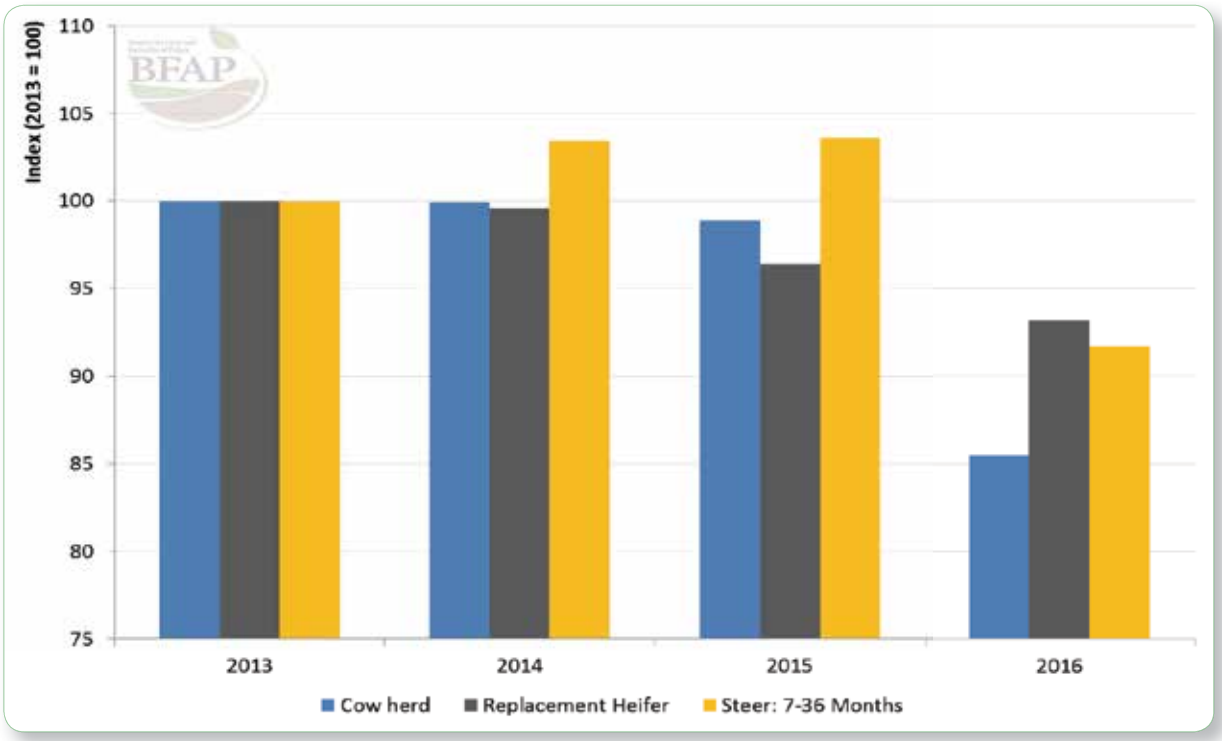


Figure 72: *Index of cow herd, replacement heifer and steer numbers nationally: 2013-2016*

Box 8.1: Beef export expansion: optimisation of carcass value in the global market

Over the past 3 years, South African beef exports have increased rapidly, representing a success story within the South African livestock subsector. Some of this increase evident from 2013 onwards is a result of the first time inclusion of data on exports to Botswana, Lesotho, Namibia and Swaziland, but the greatest shift occurred in 2014 when the International Animal Health Organisation declared South Africa free of foot and mouth disease. This declaration carried with it access to a number of export markets and sharp increases in exports to Vietnam, the United Arab Emirates and Jordan followed from the second quarter of 2014 onwards (Figure 73).

Exports comprise mainly high value cuts, which have allowed South African producers to optimise total carcass value in markets where a premium is attainable. Thus in a time when domestic beef prices were stagnant around R34/kg, access to export markets allowed exporters to benefit from attractive prices in other regions. In light of exchange rate depreciation, average export prices increased from R36.46/kg during the 4th quarter of 2014 to R46.16/kg a year later, an increase of 26% (Figure 74). Over the same period, export prices expressed in USD remained the same at $3.25/kg. Over the past 12 months, improved access to the global market supported the profitability of beef producers through the current drought by expanding demand in a period of increased supply and weak domestic demand. Consequently, prices have been sustained, in contrast to previous drought periods which typically resulted in lower prices in the short term due to oversupply in the market.

The evolution of exports over the past three years represents a prime example of possible growth opportunities when access to export markets is improved for an industry that is fundamentally competitive in the global market. Thus export growth has introduced a structural shift in the beef market, supporting profitability and underlying a positive growth outlook. It also underscores the importance of maintaining disease free status going forward. Loss of the current foot and mouth free status implies that this access, as well as the market share obtained in the Middle East will be lost to South African producers.

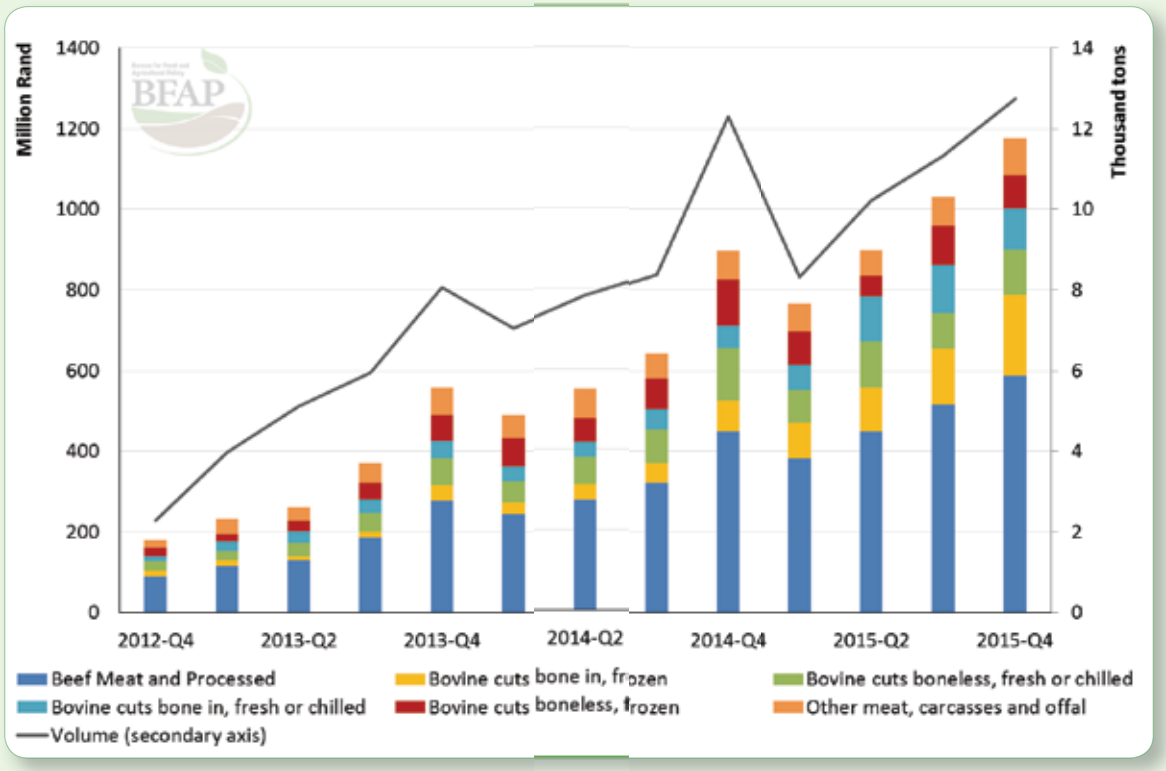


Figure 73: *Beef Exports per Product*
Source: Compiled from ITC's Trade Map

Figure 74: *Domestic- and Export Beef Prices*
Source: ITC Trade Map, 2016

Slaughter volumes are expected to level off through the rest of 2016, declining by 4% year on year and combined with lower carcass weights, a result of excessively high feed costs, beef production is expected to decline by approximately 6%. Despite weak domestic demand, exports continue to rise and are projected to exceed 50 thousand tons in 2016, supporting a year on year increase of 13% in A2/A3 carcass prices. The impact of cow herd reduction becomes evident in 2017 and 2018 however, when slaughter volumes decline by 14% and 15% respectively relative to 2016. The impact on production is marginally less given that the decline in feed prices supports higher carcass weights, but still sufficient to induce a further 14% increase in carcass prices. Thus beef carcass prices are projected to reach an all-time peak of more than R45 per kg in 2018. Assuming a return to more favourable weather conditions, producers are expected to enter a herd rebuilding cycle, allowing a recovery in production volumes from 2019 onwards. By 2025, beef production is projected to approach 775 thousand tons. Given the cautious outlook for income growth, domestic consumption also declines in the short term, before recovering over the second half of the outlook. Assuming that South Africa remains free of Foot and Mouth disease, exports are also projected to remain firm and from 2020 onwards, South Africa is expected to remain a net exporter of beef. Consequently nominal prices are projected to increase by an annual average of 5.8% per year over the next decade, which is in line with inflationary expectations and implies a fairly constant real price in 2025 relative to 2015.

The impact of the drought on beef markets is not limited to pasture quality, as maize prices remain an important consideration for intensive livestock production. Apart from representing the core source of energy in the feed ration, maize prices tend to influence both the supply and demand of calves. During a drought period, calve prices are often under pressure due to the combination of high supply and weak demand arising from higher maize costs, yet the adverse is true when weather conditions improve. Lower feed costs increase the demand for calves, while supply is often constrained by herd rebuilding efforts. Furthermore, maize producers that also manage livestock enterprises typically aim to realise a higher value for their maize by feeding it to calves which are not marketed immediately. Thus supply and demand dynamics can result in rapid increases in calf prices.

Contrary to past droughts, calf prices have also sustained fairly well through the current season, though the projected increase in calf prices of 7% in 2016 is merely half of the 13% projected for beef prices. The return to lower feed grain prices in 2017, combined with supply limitations arising from current herd liquidation is expected to support an increase of more than 20% in weaner calf prices in 2017 to more than R25 per kg (Figure 76). Thus the calf to maize price ratio also increases, but not to the levels of 2010/11 due to the shift in beef prices. In the medium term, calf prices increase marginally faster than beef, resulting in a slightly increasing trend in the calf to beef price ratio towards 2025.

The chicken industry stands in stark contrast to the beef sector in recent years. In light of its high capital requirements and limited flexibility in the feeding system, the impact of the drought is fundamentally different and despite pressure on profitability, the effect on production volumes has been far less severe. Whereas beef exports have been expanding, chicken imports have increased rapidly since 2010 and by 2015, imports represented almost 23% of domestic consumption. Consequently, domestic prices remain sensitive to that of imported products and while the current drought has exacerbated the situation, producers have found their profitability under pressure for a number of years.

Intensive use of feed grains in the production system renders poultry production particularly vulnerable to rising feed costs. While such costs arguably represent an important factor affecting domestic price negotiation, the availability of competitively priced imports often constrains the extent to which meat prices follow feed costs. Over the past 5 years, the price of Individually Quick Frozen (IQF) pieces, which comprise the bulk of the domestic market, has not increased to the same extent as feed products. As a basic indicator of profitability in the industry, the chicken to maize price ratio has trended downwards for most of the past decade and as a result of drought induced high maize prices, reached an all-time low in 2016. Given a return to normal weather conditions and the associated decline in maize prices, a significant recovery is projected in 2017, before stabilising at levels similar to 2015 over the course of the next decade. This recovery places broiler production on a positive growth path over the outlook, but given that the meat to maize ratio remains well below the levels observed prior to 2011, the associated production growth also slows. It is expected that production will only expand by 14% up to 2025 relative to the average level attained from 2013 to 2015. This contrasts with a 29% increase in domestic demand, as consumption approaches 2.5 million tons by 2025. In line with the trend observed over the past 5 years, imports will therefore account for a greater share of consumption growth than domestic production.

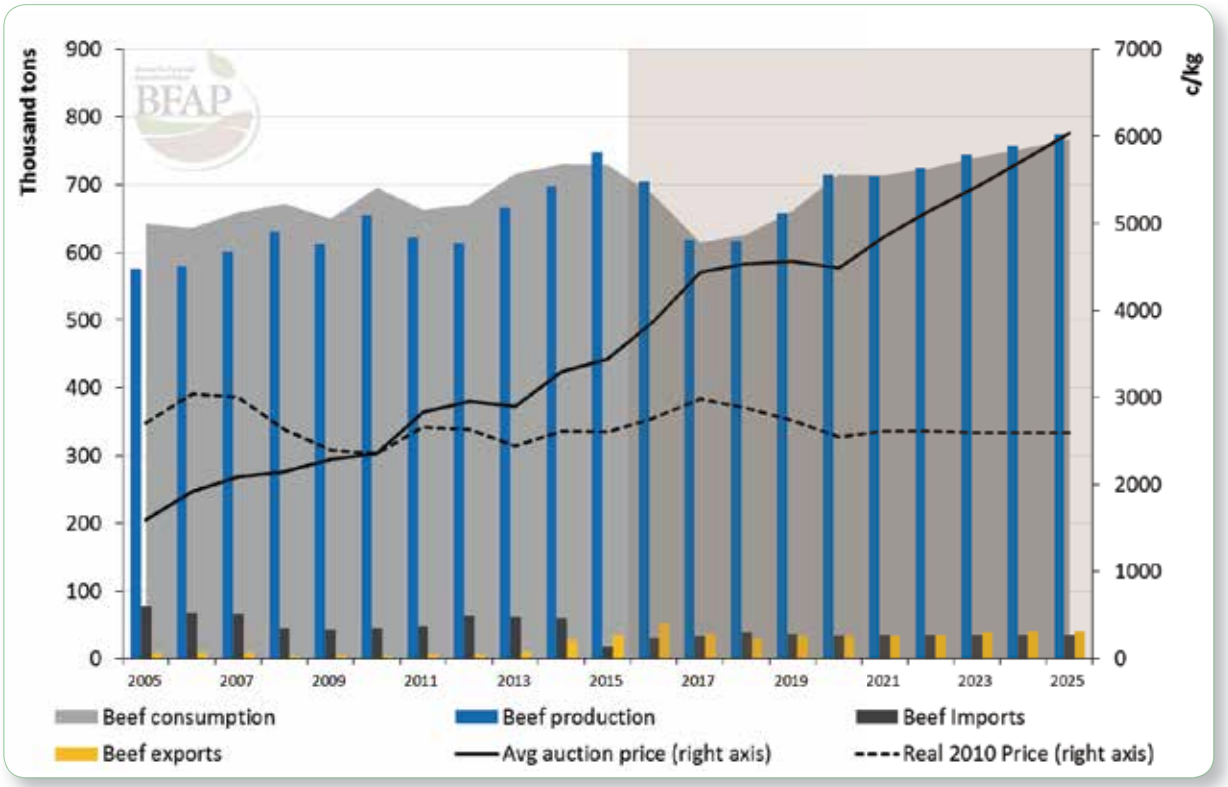


Figure 75: *SA beef production, consumption and price: 2005-2025*

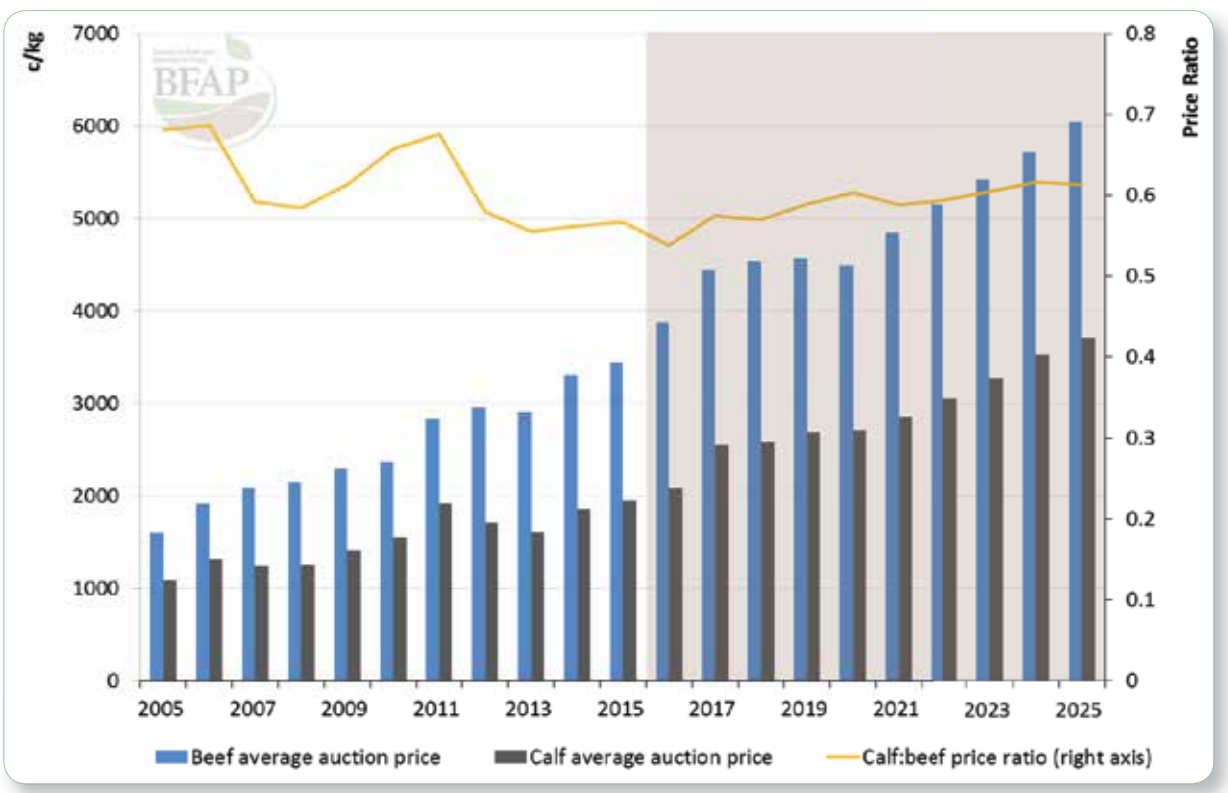


Figure 76: *SA beef price versus calf price: 2005-2025*

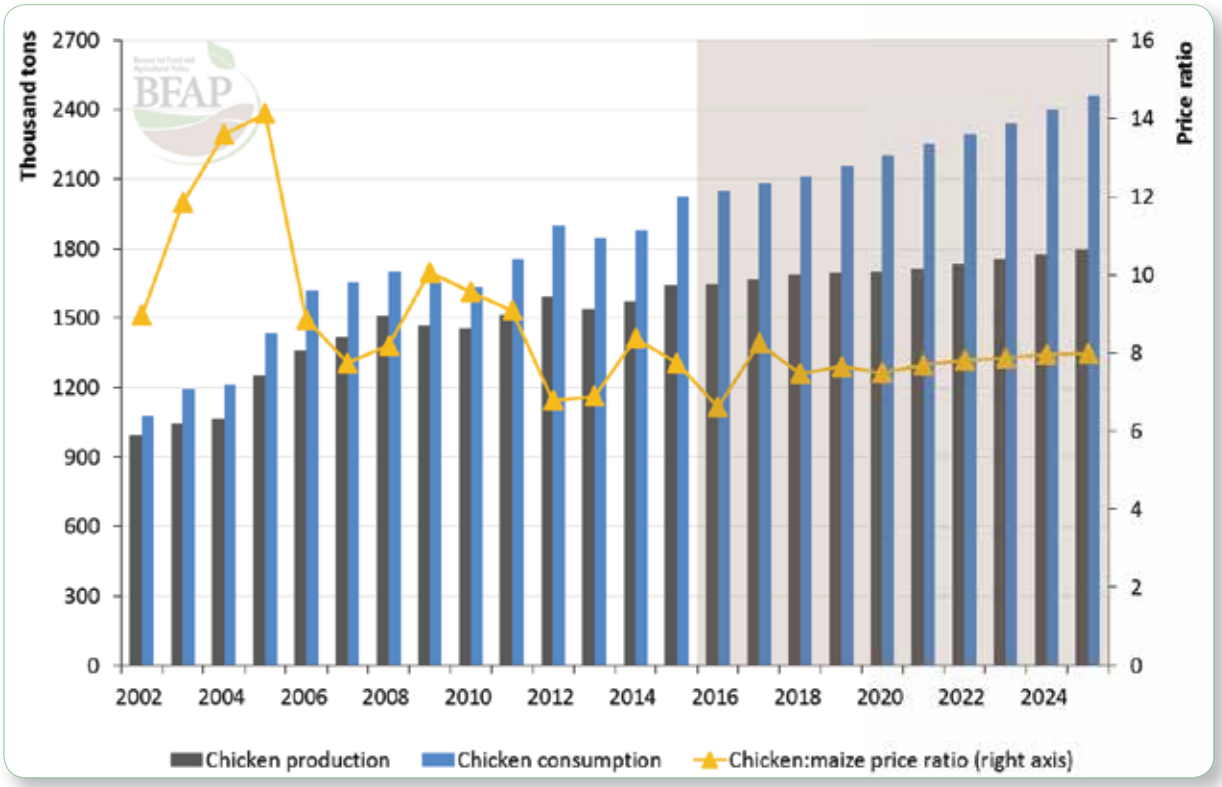


Figure 77: *SA chicken production, consumption and chicken-maize price ratio: 2002-2025*

Given that production has failed to keep up with demand growth, the inherent competitiveness of the poultry industry has been called into question. A review of South Africa's technical and economic efficiency in the global context, conducted in collaboration with the LEI, a research institute within Wageningen University in the Netherlands, suggests that the technical efficiency of South African producers compares well with their international counterparts. Feed conversion ratios obtained in South Africa are well below the sample average and Figure 78 indicates that the cost of producing chicken in South Africa is also below the sample average. While well below countries in the European Union, the cost of production in South Africa remains higher than key exporters such as the USA, Brazil and Argentina. The bulk of this difference is attributed to the cost of feed and day old chicks, as the combined share of feed and day old chicks in total cost is higher in South Africa than any other country included in the sample. South Africa relies on imported genetic material, given that imports occur at grandparent or great grandparent level, the relatively higher cost of feed also manifests in the price of day old chicks through increased production costs. It is clearly evident from Figure 78 that net exporters of key feed materials such as maize and protein meal have a significant advantage in the cost of feed as well as day old chicks. South Africa is typically a net exporter of maize, but remains a net importer of protein meal, which underlies much of the difference in feed costs. As the utilisation of increased oilseed crushing capacity continues to improve, domestic poultry producers stand to benefit, improving competitiveness.

As a measure of total production costs, Figure 79 presents the cost of both primary production and slaughter in selected countries. The quantity of chicken imported into South Africa from these selected countries is depicted on the right axis, in order to relate the relative production costs to the origin of South African imports. Production costs in South Africa remain above countries such as the USA, Brazil and Argentina, but also well below the average cost of production in the European Union (EU). Nonetheless, South Africa continues to import substantial volumes from the Netherlands, Germany and the United Kingdom.

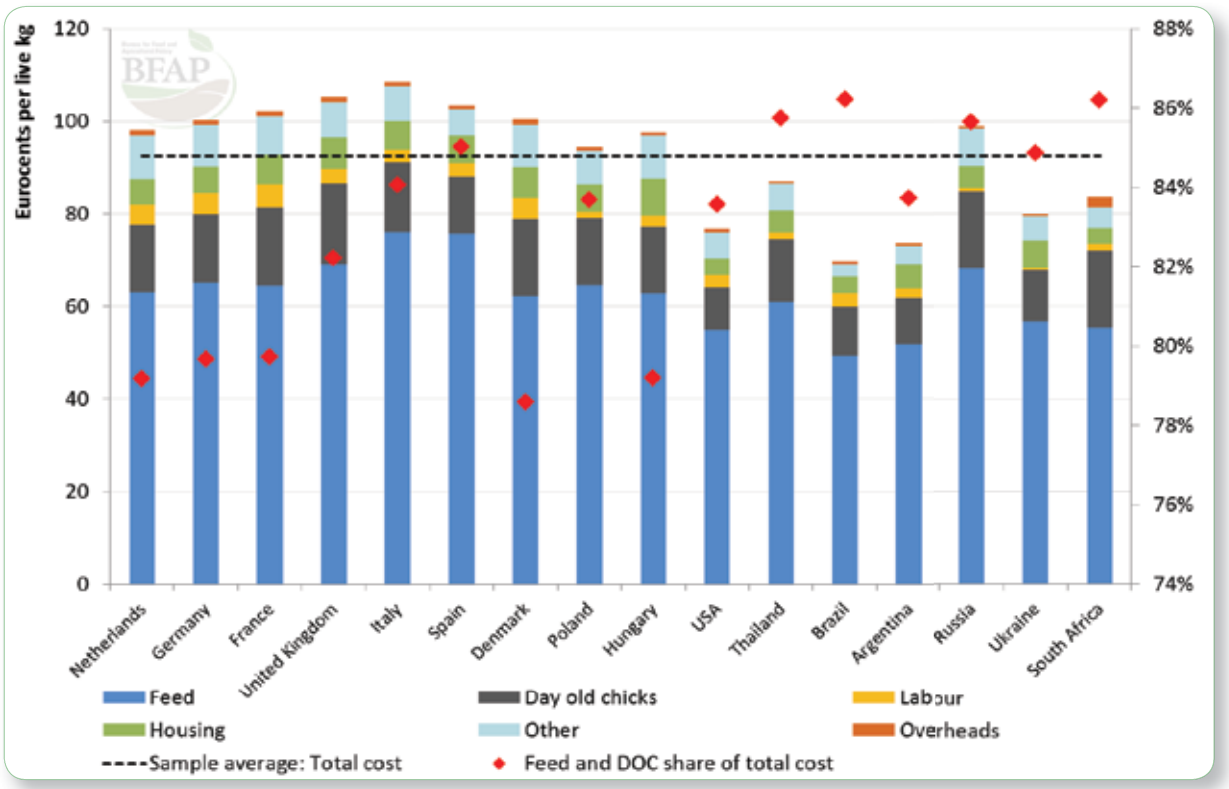


Figure 78: *Aggregate primary production costs in selected countries in 2013*
Source: Van Horne & BFAP, 2014

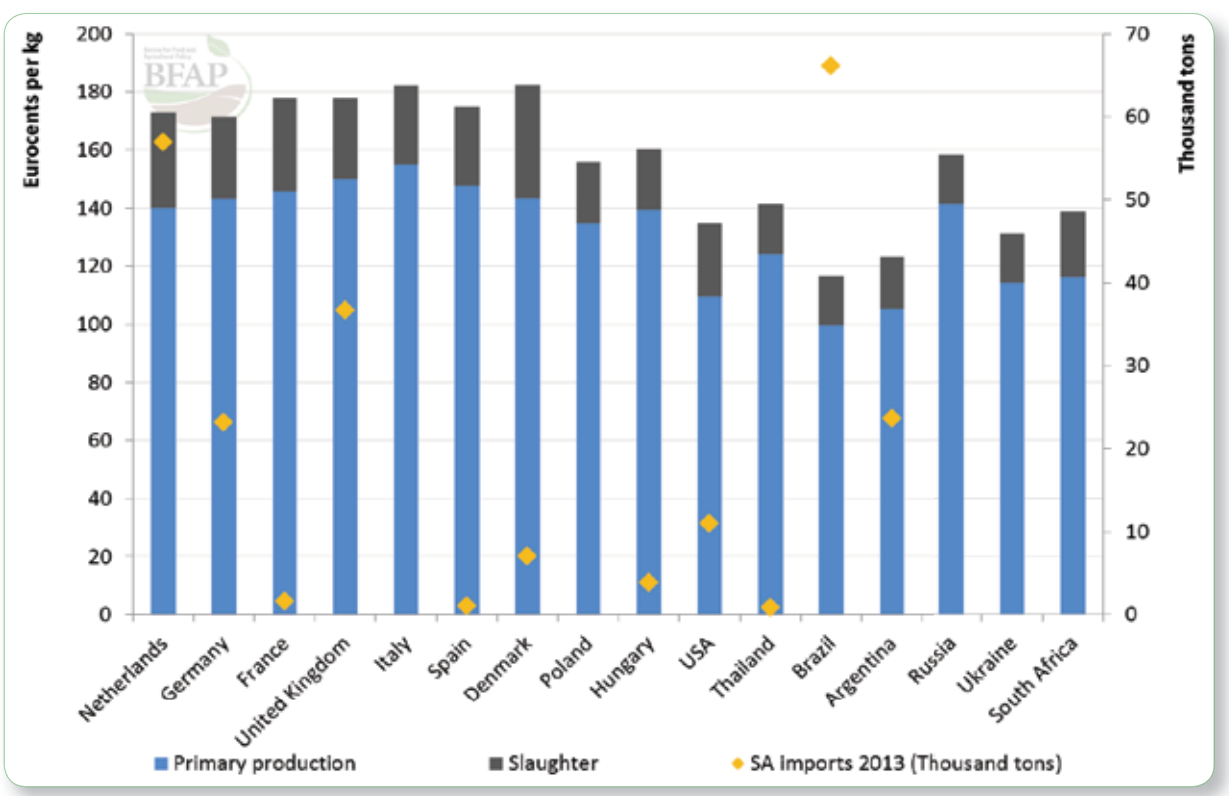


Figure 79: *Broiler production costs in selected countries and South African imports from these countries in 2013*
Source: ITC Trademap, Van Horne & BFAP, 2014

The figures presented are for a single production year only (2013) and consequently provide only a snapshot of South Africa's competitive position in the global context. Nevertheless, the results provide an indication of the drivers that influence South Africa's competitive position in the global broiler market. Considered in conjunction with the origin of imported chicken, it also suggests that rising import volumes are not simply a result of a failure to compete in the basic cost structure. Thus Figure 80 presents a more detailed view of import growth since 2010, suggesting that the bulk of import growth is attributed to a single tariff line representing bone-in portions – particularly those imported duty free from the EU. Contrary to the EU, where producers obtain a significant premium for chicken breasts, the demand structure in South Africa favours bone-in portions. Thus producers in the EU and the US optimise carcass value by marketing breast meat at a premium domestically, whilst exporting bone-in portions at very competitive prices. In the South African market, these imports essentially balance the demand, providing only the most popular cuts, yet domestic producers are forced to compete on prices, without obtaining the same premium for other parts of the carcass. Going forward, the abolition of traditional anti-dumping tariffs on a quota of 65 thousand tons of bone-in portions originating from the US to aid the renewal of the African Growth and Opportunities Act (AGOA) will expose South African producers to further competition in the production of these cuts.

In order to level the playing field for domestic producers, the South African Poultry Association have applied for a safeguard that will subject imports originating from the EU to the same general duty of 37% faced by other countries. Given that no decisions have been made, the baseline projection is based on the current tariff structure being maintained. Should it be introduced, the safeguard will support domestic prices by increasing the price of imported products, resulting in reduced import volumes. Domestic production will be stimulated despite a relatively weaker demand outlook. A greater share of consumption growth over the outlook will therefore be supplied by domestically produced products. The success achieved in growing beef exports into Middle Eastern markets also suggests that improved access to export markets for poultry producers should be pursued in support of domestic production. Beef producers have been particularly successful in optimising the value of the carcass through the export of high value cuts in recent years and if the same can be achieved in the poultry sector, producers and consumers alike will benefit.

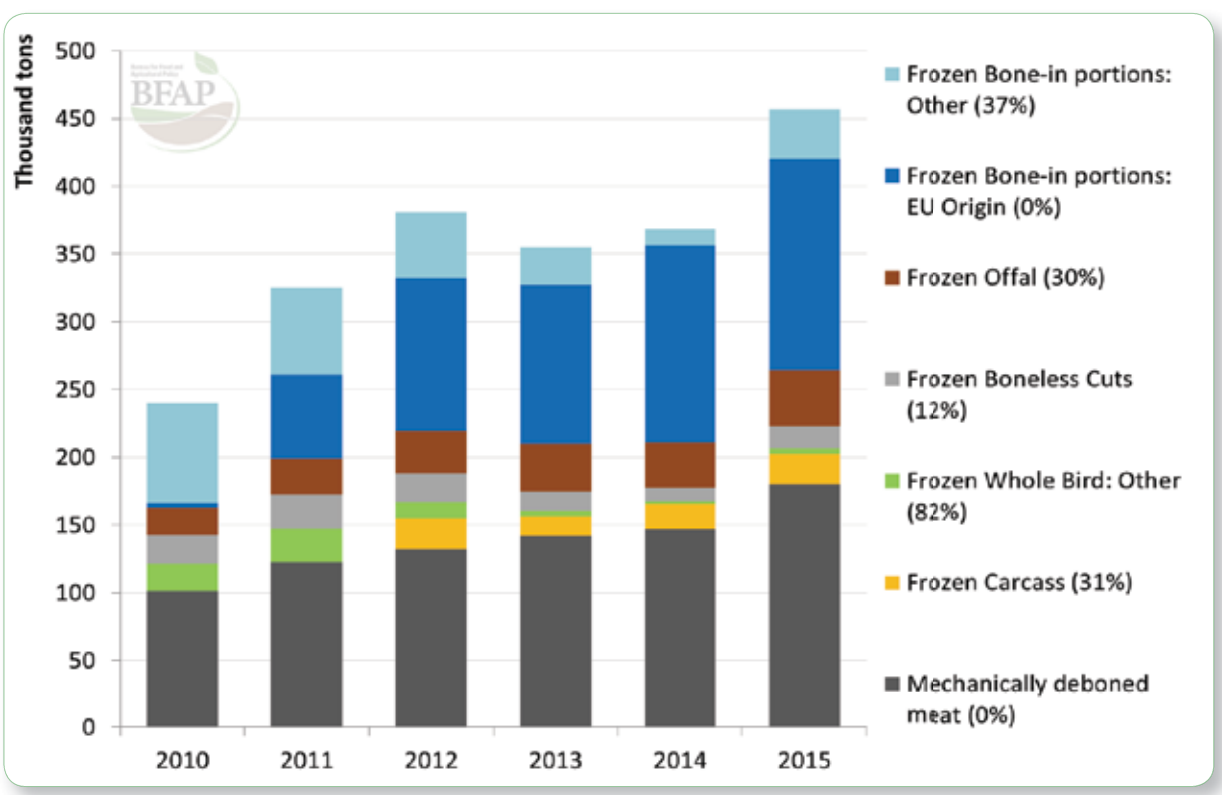


Figure 80: *Current tariffs and composition of chicken imports into South Africa: 2010 – 2015*
Source: Compiled from ITC Trademap

Box 8.2: Small-scale poultry production– how small is big enough?

The South African Poultry Association (SAPA) estimates that small scale commercial production accounts for 5% and subsistence production for 4% of total domestic chicken production in South Africa. SAPA classifies small scale commercial broiler farmers as producers producing less than 120 000 broilers per cycle (less than 24 000 broilers produced per week). Whilst small in the context of this industry, producers of 120 000 broilers per cycle would still need at least 3 broiler houses, requiring substantial capital investment. Based on Developing Poultry Farmers Organisation (DPFO) membership indications, as collected by Silverpath Consulting (2014), the vast majority of small-scale poultry producers are considerably smaller, with 75% of farmers in the 308 small-scale broiler farmer sample placing less than a thousand chicks per month. More than 50% of small-scale broiler farmers place less than 500 chicks a month and when the last quarter survey of 2014 was done close to 60% of the survey sample held 500 or less chicks (32% held 200 or less).

This state of affairs prompts the question – how small is big enough? How many broilers should an individual produce to earn a decent or reasonable income if broiler production is his / her only income generating activity?

In order to answer these questions BFAP purposively selected a variety of small-scale broiler and egg producers. Broilers producers ranged from farmers producing few, larger (2.2kg) birds on a longer growth cycle to a larger and staggered placement production system selling smaller live and slaughtered chickens. While no single producer can be considered representative of small scale production at large, disaggregation of poultry specific labour expenditure is problematic and government support to some developing farmers complicates comparisons, it was found that the average gross margin per bird for small scale broilers producers was R11.26. This is substantially higher than the gross margin of commercial contract or independent broiler producers and the main reason for this is that smaller producers market directly to consumers, charging a near retail price for larger birds. It can be expected that increased production by small scale farmers will result in a lower price and gross margin.

Considering the average gross margin obtained by the different emerging producers, Table 9 presents the required operational size that would result in income from broiler production breaking even with income levels from various other sources, as well as the South African poverty line. In this calculation the broiler number requirements were adjusted for mortality rates, which are quite high for smaller producers.

Table 9: *Size required for break-even income levels from alternative sources*

	* Income Per Month (Rand)	Income Per Year (Rand)	Birds per year	Birds per cycle (6.5 Cycles p.a.)	Birds per cycle (4.5 Cycles p.a.)
South African Poverty Line (2008 value)	515	6180	549	84	122
Farm Worker (Minimum Wage)	2 420	29 045	2 581	397	573
Hospitality Sector (Minimum Wage)	2 751	33 012	2 933	451	652
Taxi Drivers (Minimum Wage)	2 847	34 164	3 035	467	675
Entry Level Mine Worker	6 000	72 000	6 397	984	1 422

** Source: Department of Labour (2014)*

In order to break even with a minimum wage of a farm worker, a poultry producer would require approximately 400 birds per cycle. This is based on the assumption that there are 6.5 production cycles in a year. In some instances, small scale producers with less sophisticated heating systems would not produce during the winter (especially on the Highveld) since mortality rates, in the harsh climate is simply too high. If it is assumed that no production takes place during May, June, July and August, there are only 4.5 production cycles within a year. This would require around 75 birds more per cycle to break even with the minimum wage of a farm worker. Breaking even with the salary of an entry level mine worker would require 984 birds per cycle for a full year's production, a figure which rises to around 1400 if no winter production takes place. Based on these comparisons and the number of birds held by DPFO members, less than 40% of the broiler farmers surveyed by Silverpath earn more than a farm worker – assuming that poultry farming is their only income source.

An interesting and relevant size to consider is 1500 birds per cycle. Interviewed respondents indicated that corrugated iron broiler houses are commonly received by small-scale broiler producers as a grant in the Comprehensive Agricultural Support Programme (CASP). The capacity of this type of housing is approximately 1500 birds per cycle and as a result, the income that can be earned from such a structure would range between R6 331 and R9 145 per month, for 4.5 and 6.5 cycles per year respectively. A producer receiving this type of grant would be able to generate a monthly income that is comparable to that of an entry level mine worker. However, the CASP grant generally only provides the structure with no heating, lighting or feeding fixtures. Due to the lack of these fixtures there is usually a high mortality rate associated with these structures. With the right training and access to heating, lighting and feeding fixtures, a small-scale CASP broiler housing beneficiary could earn a comparatively good living.

Trade accounts for a limited share of the South African egg market and hence the impact of international price movements is limited relative to meat markets. Its reliance on intensive feed grain use however also makes the sector vulnerable to high feed costs, which have impacted on profitability in the recent past. Following a recovery in the egg to maize price ratio in 2014, egg production increased in 2015 for the first time since 2012, yet the impact of the current drought results in fairly stagnant production in 2016 and 2017. Following a return to stable weather conditions over the outlook, egg prices are expected to expand faster than maize prices, inducing an expansion of 1.6% per annum over the course of the next decade. This represents a slowdown from the levels achieved over the past decade, as egg to maize ratios are not projected to return to pre-2011 levels. Production growth is however sufficient to match an expansion of 1.7% per annum in domestic demand and South Africa is expected to remain a small net exporter of eggs by 2025.

Despite being a much smaller industry, the pork sector in South Africa exhibits a number of similarities to poultry. Production systems are equally intensive, with feed contributing a substantial share of production costs. It represents a much smaller share of total meat consumption however and between 2013 and 2015, represented less than 8% of the total meat complex in South Africa. Consumed fresh, pork represents an affordable alternative to beef and lamb, but a substantial share is also consumed in processed form, implying significant value addition. Thus while fresh pork represents an alternative to rising beef prices, processed pork is also often consumed by higher income consumers, where the impact of the economic slowdown is less evident. Thus firm consumption growth is projected over the next decade, with domestic use exceeding 300 thousand tons by 2025.

Production has also expanded over the past decade and while

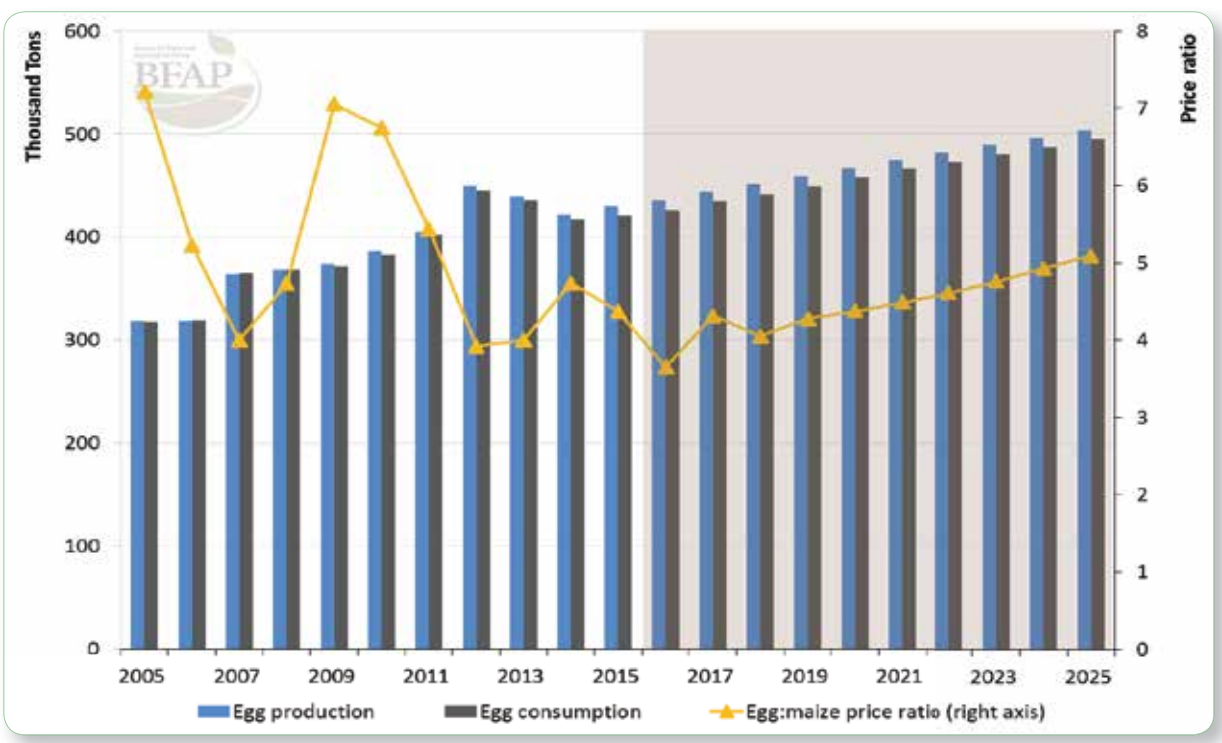


Figure 81: *SA egg production, consumption and egg-maize price ratio: 2005-2025*

South Africa has remained a net importer of pork products historically, the share of imports in domestic consumption has remained fairly consistent. Import composition, which consists predominantly of ribs, suggests that it has a role in balancing the domestic market by supplying only the cuts in highest demand. Thus the share of imports in domestic consumption is projected to remain fairly constant over the next decade.

Despite the projected increase of more than 8% in pork prices in 2016, profitability is under pressure as a result of high feed costs and similar to other livestock sectors, the pork to maize price ratio is projected to fall to its lowest level to date in 2016. Recovery is evident in 2017 however and over the course of the next decade, pork prices find support from beef, inducing production growth in response to rising demand. By 2025, pork production expands by an annual average of almost 3%, only marginally slower than the past 10 years. Over the past decade, rising carcass weights and improved efficiency have been the main constituents of production growth, as opposed to increased sow numbers. While improving efficiency is no doubt positive, significant increases in production in the future will be dependent on continued improvements in efficiency as well as greater investment and expansion of the sow herd.

Typically produced in an extensive, pasture based system, lamb and mutton production in South Africa is also sensitive to weather conditions. Given the reliance on imported products to supplement domestic production, this sensitivity to weather conditions stretches beyond South Africa's borders, as weather impacts in exporting regions such as Australia and New Zealand influence the South African market through world price movements. Globally, lamb prices have been on a declining trend since mid-2014 and while the depreciation in the exchange rate has mitigated the impact in domestic markets, lamb prices are not expected to increase to the same extent as beef prices in 2016. This comes despite a significant decline in flock numbers reflected in the survey conducted by the UFS for the RPO (Figure 83). Similar to the beef sector, the survey indicates that producers with limited pasture have reduced the ewe flock, preferring to retain younger replacement ewes. As these ewes may typically have been included in the group of lambs finished for the market, the survey shows a significant reduction in finishing lamb numbers in early 2016 relative to 2015.

The reduction in flock numbers through the current drought is evident in projected sheep production in 2017, which declines by almost 11% year on year. Despite the decline, lamb prices are projected to increase only marginally in 2017 following a further decline in world prices combined with further exchange rate depreciation. In the medium term, nominal lamb prices are projected to increase by an annual average of just under 5%, led by import parity levels. Accounting for general inflation implies a marginal decline in real terms, resulting in production growth of just under 0.5% per annum over the course of the next decade.

Given the shorter production cycle, the recovery from drought

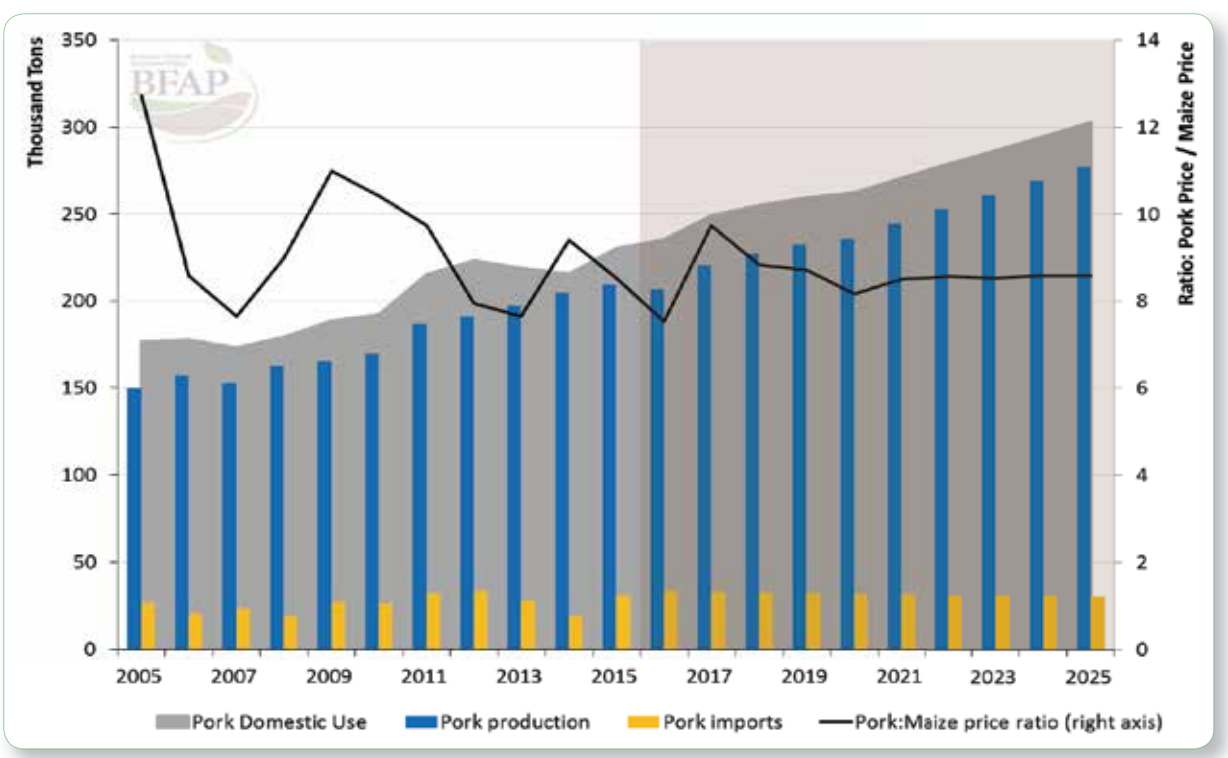


Figure 82: *SA pork production, consumption, imports and pork to maize price ratio: 2005 - 2025*

induced flock liquidation is faster than in the beef sector and following the sharp reduction in 2017, the first increase in production volumes is already evident in 2018. Production increases consistently over the outlook to exceed 120 thousand tons by 2022. Beef prices set to increase substantially more than lamb prices and hence substitution is expected amongst higher income consumers, supporting the demand for lamb. Consequently import volumes rise once more in the outlook period and having declined to below 10% in 2015, the share of imports in domestic consumption stabilises at just over 20% by the end of the projection period.

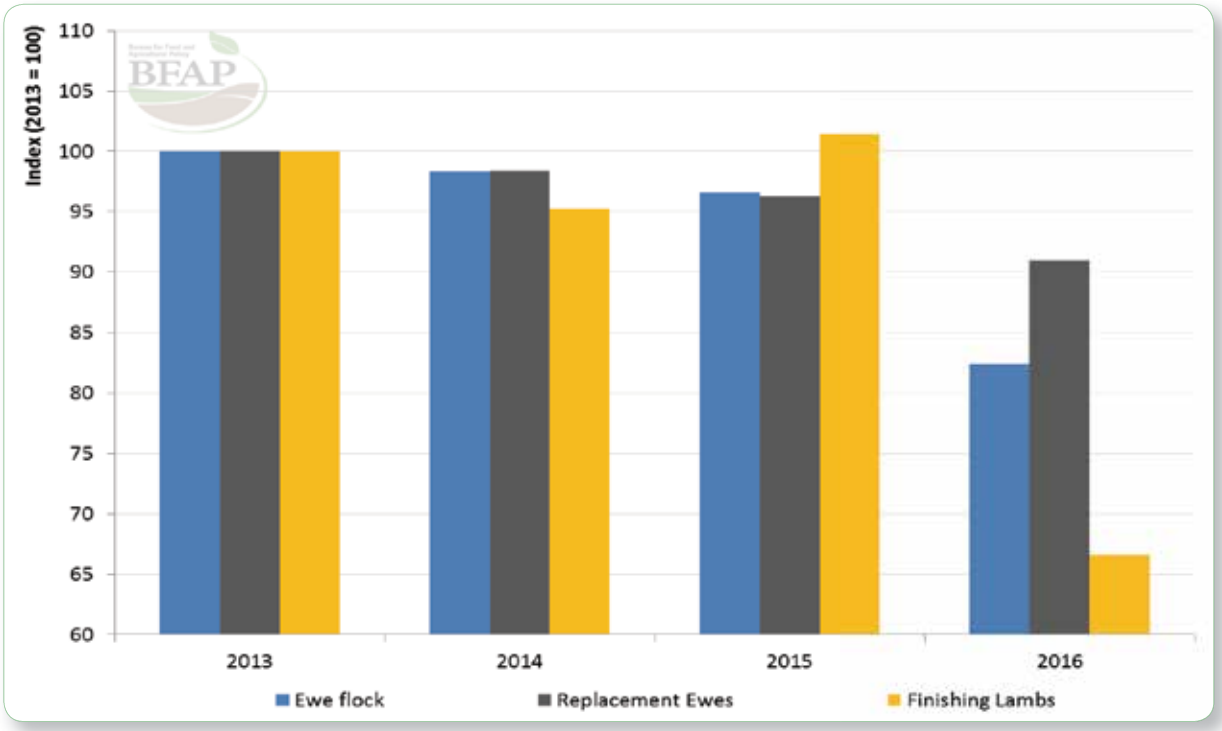


Figure 83: *Index of national sheep flock: 2013-2016*

Source: University of the Free State and Red Meat Producers Organisation, 2016

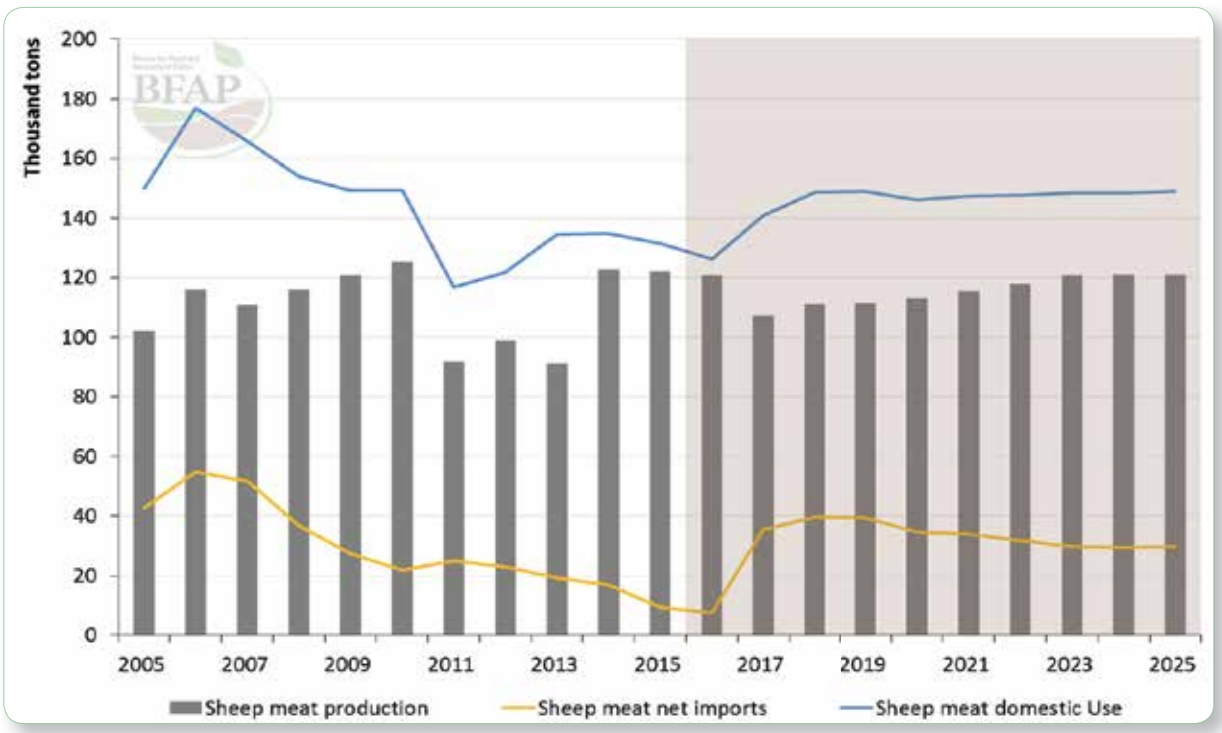


Figure 84: *Sheep meat consumption and imports: 2005-2025*

SOUTH AFRICAN OUTLOOK

Outlook for animal products

MILK AND DAIRY PRODUCTS

In April 2016 the FAO dairy price index, a measure of global prices of dairy products, reached its lowest level in 7 years. This follows an exceptionally volatile period in global dairy markets, which are particularly sensitive to fluctuating weather conditions, as well as macroeconomic instability.

Milk and dairy – Global

In April 2016 the FAO dairy price index, a measure of global prices of dairy products, reached its lowest level in 7 years. This follows an exceptionally volatile period in global dairy markets, which are particularly sensitive to fluctuating weather conditions, as well as macroeconomic instability. On the supply side, this sensitivity arises from feed price volatility, flexibility in feed use intensity and the impact of weather conditions on the productivity of the global dairy herd. At the same time, demand is sensitive to macroeconomic changes, as is evident from the extent to which prices for skimmed milk powder (SMP) and whole milk powder (WMP) declined in 2015 on the back of weaker import demand from China. Whilst dairy markets are typically cyclical, the steepness of the cycles over the past decade bear testament to the dramatic changes in weather conditions, combined with an unstable macroeconomic environment. In 2015, when weak demand arising from slowing income growth prospects combined with strong supply due to favourable weather conditions and falling feed grain prices, dairy product prices declined by between 25% (cheese) and 44% (SMP).

Previously good margins and the removal of the EU milk quota in April 2015 has promoted strong production growth in Europe. With limited growth in domestic consumption, exports are projected to rise, more than offsetting the expected decline from extensive production in New Zealand. Demand from China, one of the largest global importers is expected to remain weak in the short term and combined with the continuation of the ban on EU imports in Russia, global dairy prices are projected to decline further in 2016. The OECD-FAO outlook expects prices to bottom out in 2016, as production responds to current lower prices. Import demand is also projected to recover at these lower prices, based on firm growth in the Middle East and Asia, as well as the assumed lifting of the Russian import ban from 2017 onwards. Following the recovery through 2017 and 2018, prices are expected to stabilise at levels similar to 2012 over the rest of the next decade.

Price projections reflect the assumption of stable weather conditions and given the sensitivity of supply levels to unpredictable climatic conditions, projections could be radically different in the event of inevitable climatic fluctuations. Furthermore, the market will remain sensitive to policy changes and the extent to which import demand from China recovers. The OECD-FAO outlook foresees that China will not resume importing WMP and butter at 2014 levels, instead servicing much of its demand internally, but SMP and cheese imports are expected to rise over the next decade.

The OECD-FAO outlook projects firm demand growth for dairy products over the next 10 years, dominated by developing countries. Fresh dairy products are consumed in greater volumes than processed products in these regions and consequently the share of fresh dairy products in the global consumption basket is projected to increase over the next decade. Within these developing regions, consumption of fresh dairy products is projected to expand by an annual average of 2.9%. Per capita consumption of dairy products expands much slower, increasing

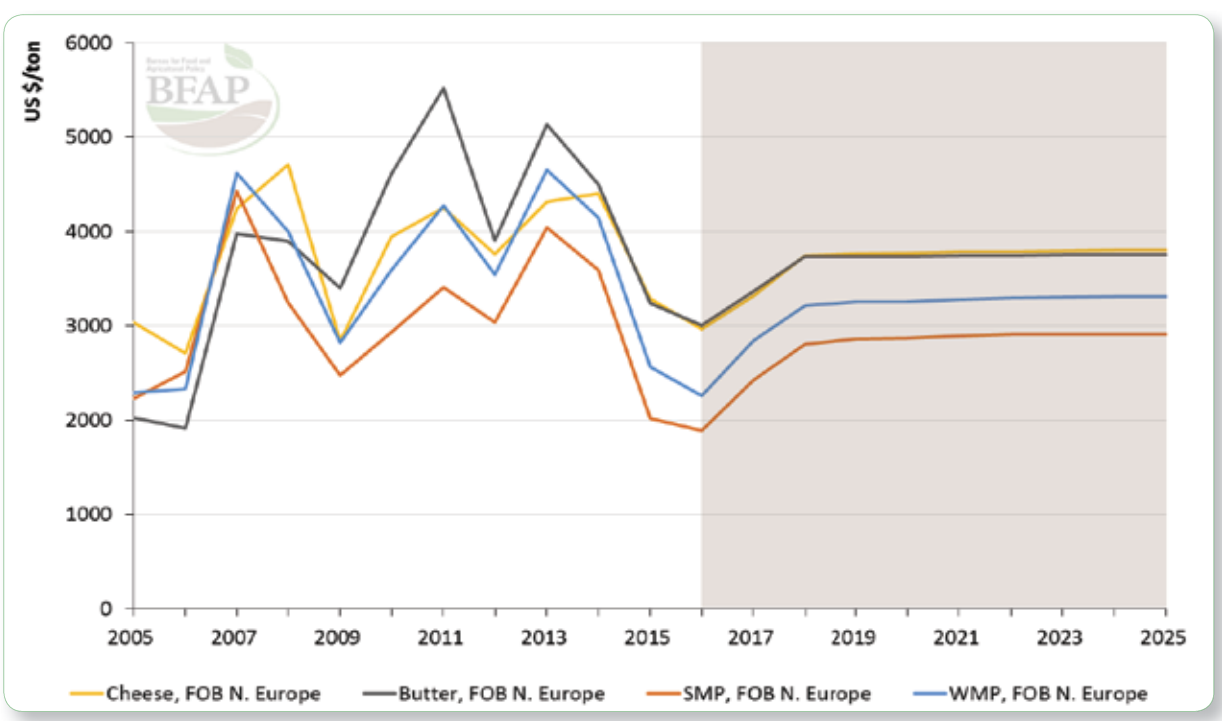


Figure 85: *Global dairy prices: 2005-2025*
Source: FAPRI and OECD-FAO (2016)

on average by 1.9% p.a. for butter, 1.6% p.a. for skimmed milk powder (SMP) and 1.4% p.a. for cheese and whole milk powder (WMP). Responding to the increasing demand for dairy products, global milk production is projected to increase by almost 170 million tons by 2025 relative to average levels for 2013 to 2015, an average expansion of 1.75% per annum. While the EU system of milk quotas is scheduled to end in 2015, the OECD-FAO Outlook projects a smooth transition, as historic output levels have remained well below EU quota levels for most member states. Trade in dairy products is also projected to expand through the coming decade, led by SMP (2.7% per annum) and WMP (2.3% per annum).

Milk and dairy – South Africa

While South Africa is a very small producer in the global context, it is equally sensitive to macroeconomic turbulence and changing weather conditions, which influence feed use levels, profitability indicators such as the milk to maize ratio and productivity. The result is a volatile market and in light of the perishable nature of the product concerned, trade represents a very small share of fresh dairy consumption. This limits the extent to which international trade can alleviate domestic supply and demand shortages and exacerbates the volatility in the market.

The dairy industry has not been spared from the 2015/16 drought, owing to its impact on feed prices and also grazing conditions. Having exceeded 3 billion litres (3.1 million tons) for the first time in 2015, production is expected to decline by approximately 3% in 2016. Milk production in South Africa is utilised in 2 different market segments liquid milk products (including pasteurised milk, UHT milk, yoghurt and buttermilk) account for just under 60% of total dairy consumption, while concentrated products (including cheese, butter, milk powders and condensed milk) make up the balance. Given the low prices of concentrated products, particularly milk powders in the global market, the share of liquid milk products is projected to increase marginally in 2016.

As a result of reduced production, milk prices are projected to reach an all-time high of almost R4.81 per litre on average in 2016. Nonetheless the drought induces increase in feed grain prices pushes the milk to maize price ratio to its lowest level since 2007. Dairy product prices are also expected to increase in 2016, with lower world prices being offset by the sharp depreciation in the exchange rate. In light of a further, albeit smaller increase in milk prices projected in 2017 combined with the expected decline in feed grain prices arising from a larger domestic harvest under improved weather conditions, the milk to maize price ratio recovers is 2017. Consequently milk production is projected to increase to a level similar to 2015. Over the course of the next decade, milk prices are projected to increase at an annual rate of just under 5% per annum, marginally slower than inflation. The increase is however sufficient to keep up with the projected annual increase in maize prices and is therefore sufficient to induce production growth of 25% by 2025 relative to the 2013 – 2015 base period.

Over the course of the past decade, the demand for dairy products has expanded rapidly, increasing by more than 35% over the 10 year period. Rising per capita income levels, combined with continued urbanisation and dietary diversification have been fundamental drivers behind this demand. In light of more cautious growth projections in the coming decade, demand growth is projected to slow relative to the past, particularly in the short term. In line with historic trends, consumption of liquid milk products is projected to grow relatively faster than concentrated products and by 2025, fluid milk consumption is projected to expand by more than 26%. Consumption of concentrated dairy products is projected to rise by just over 24% over the same period.

Despite total growth in concentrated dairy product consumption being slower than that of fluid milk products over the past decade, cheese consumption grew faster than any other product, doubling over the past ten years. In absolute terms, this remains the case over the projection period and by 2025, relative to a 2013 – 2015 base period, more than 35 thousand additional tons of cheese will be consumed in South Africa. Part of this expansion can be ascribed to rising population numbers, yet even on a per capita basis, cheese consumption will expand by an annual average of approximately 2%, to exceed 2.2kg per capita by 2025. Butter represents a much smaller market and while total consumption growth of 36% over the next decade almost matches cheese in percentage terms, it equates to approximately 7 thousand tons of additional consumption.

The nature of the production process means that the market for milk powders is strongly influenced by the price and production levels of other dairy products that are produced simultaneously. Consequently, consumption of milk powders has been characterised by exceptional volatility over the past decade. Nonetheless, the trend has remained upwards and over the 10 year period, domestic use of WMP and SMP rose by an annual average of 10% and 0.5% respectively. Despite this growth, powders remain a small share of the concentrated dairy market, with consumption of SMP reaching 0.11 kg/capita by 2016, compared to 0.30 kg of WMP consumed per capita in the same year. Thus while the expansion by 2025 relative to the 2013 – 2015 base period of 74% for SMP and 23% for the more expensive WMP is strong, per capita consumption levels will expand to only 0.16 and 0.33 kg per annum for SMP and WMP respectively.

Within the concentrated dairy product market, trade represents a much greater share of domestic consumption relative to fresh dairy products. With trade able to alleviate domestic shortages or surpluses in the market, prices tend to be less volatile. This

is evident in an average coefficient of variation over the past 34 years of just over 80 for concentrated dairy products such as cheese, butter, SMP and WMP, compared to a coefficient of variation of 105 for fresh milk over the same period. Trade being a bigger component, concentrated dairy products are also more exposed to competition from international markets, yet the recent decline in world prices has been offset by exchange rate depreciation, allowing domestic dairy prices to rise in 2015 and 2016. In the medium term, dairy product prices are projected to continue trending upwards in nominal terms, but not enough to outpace general inflation, resulting in marginally declining real prices over the course of the next decade.

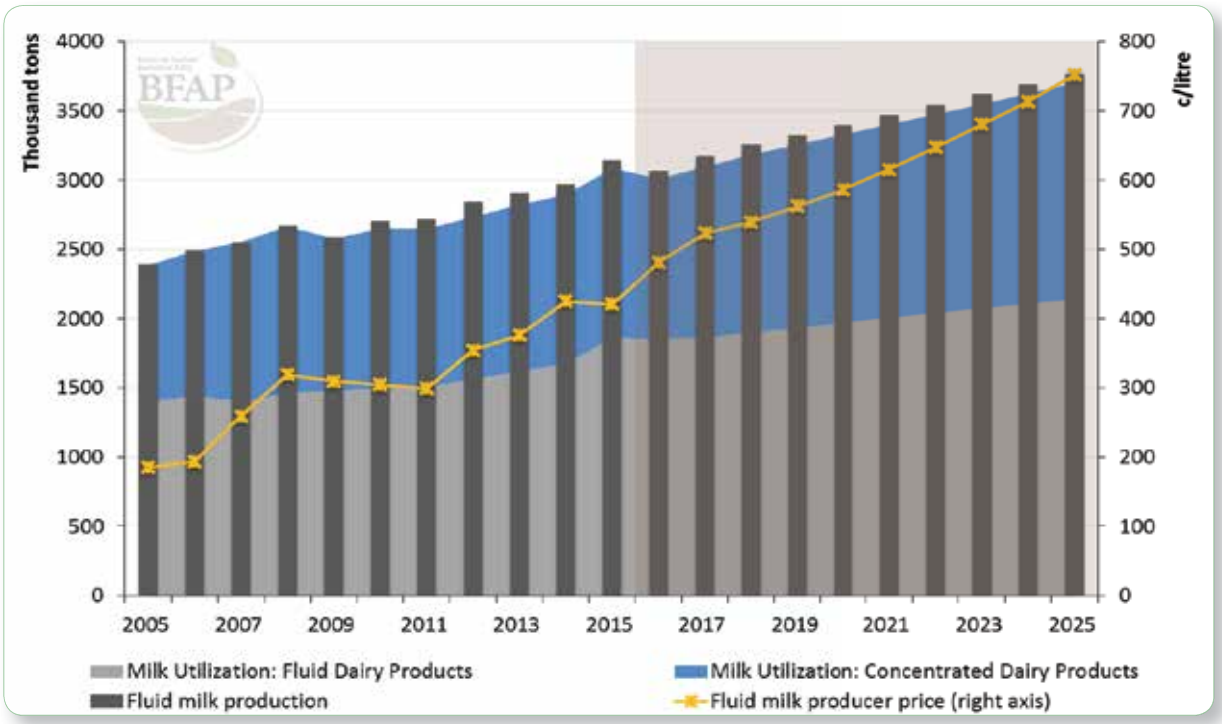


Figure 86: *SA milk production, utilisation and price: 2005-2025*

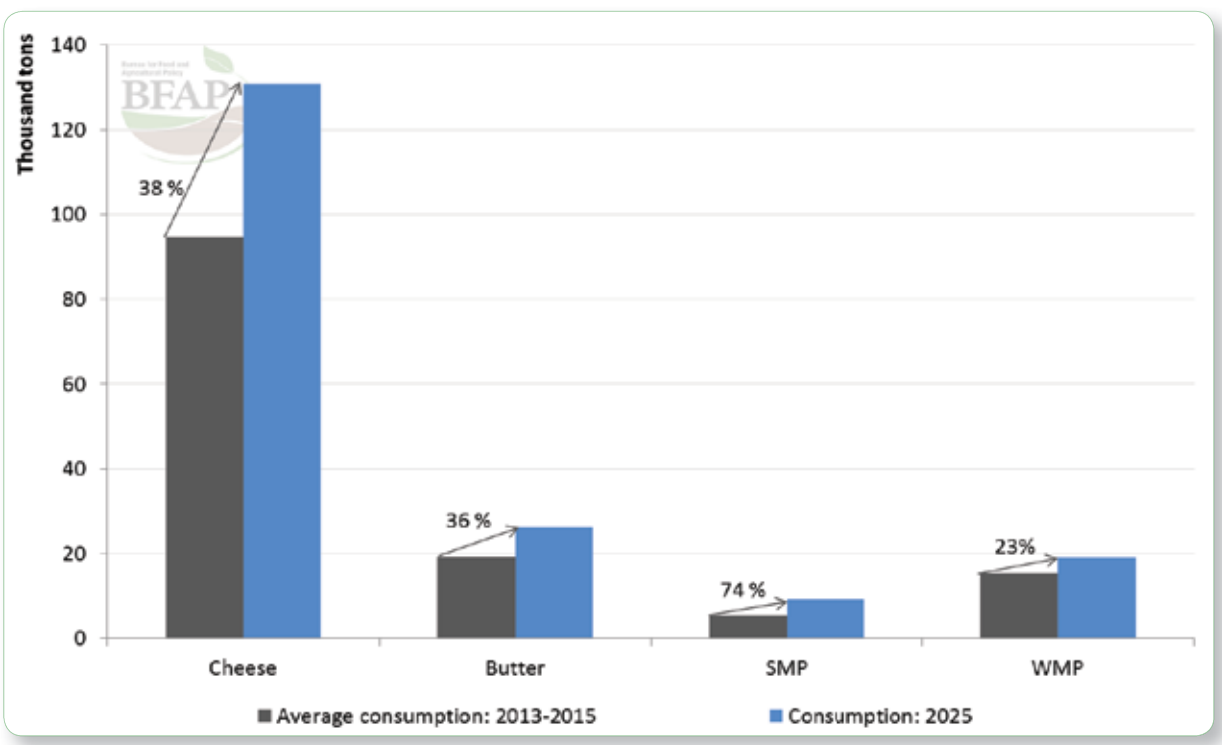
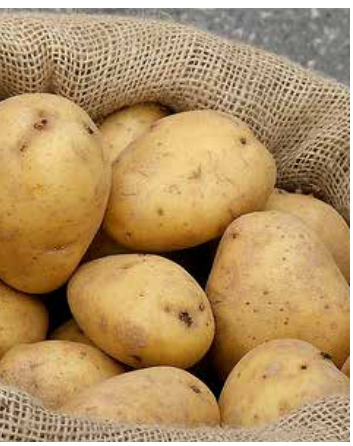


Figure 87: *SA consumption of dairy products: 2025 vs 2013-2015 average*



SOUTH AFRICAN OUTLOOK

Outlook for horticultural products

POTATOES

Potato consumption projections continue to trend upwards over the next decade, even though the 2016 consumption estimates are projected to decrease to 2.05 million tons following sharp drought and heat induced supply reductions which resulted in substantial price increases.

Potatoes

Potato consumption projections continue to trend upwards, even though the 2016 consumption estimates are projected to decrease to 2.05 million tons following sharp drought and heat induced supply reductions which resulted in substantial price increases. During the last decade potato consumption increased from 1.63 million tons in 2005 to 2.27 million tons in 2015 (39%), arising from both increased consumption per capita and a growing population. Potato demand is projected to expand by a further 12% to 2.55 million tons by 2025 (Figure 88); growth in per capita demand is expected to slow due to subdued economic growth projections, whilst population growth is expected to slow relative to the past decade. Over the outlook the informal market for potatoes continues to grow at a faster pace than formal consumption with the distribution between formal, informal and processed markets for potatoes projected at 36%, 33% and 24% respectively by 2025, with the balance being used for seed. This represents an increase from 31% and 22% for the informal and processing markets in 2015, when the formal market accounted for 38%.

Figure 88 illustrates the supply-demand balance in the potato market, as well as the area planted to potatoes. Remarkably, the area planted has remained fairly stable throughout the period shown. The 50.3 thousand hectares in 2005 expanded to 53.9 thousand hectares in 2015, which provided a record harvest of 2.48 million tons of potatoes. The increase in production over the past decade was largely fuelled by the 35% increase in average yields (irrigation and dryland), arising from better pest and disease control as well as improved cultivation practises. Yields grew from 34.13 tons per hectare in 2005 to 46.46 tons per hectare in 2015.

Following the price decrease in 2015 arising from the record harvest, a decrease in the area under potato production was expected for 2016; however the area increased marginally to 54.2 thousand hectares, suggesting that farmers consider additional factors in the decision to plant potatoes. Due to the drought and heat conditions, the average yield in 2016 is expected to decrease to 41 tons per hectare, causing a 260 thousand ton (10%) decrease in production to 2.22 million tons. Over the outlook, the area under potato production is expected to remain fairly stable with an expected 55.09 thousand hectares in 2025 while the average yield is expected to continue to increase at 2.3% per annum to 49 tons per hectare in 2025. The potato market remains finely balanced and the decrease in production in 2016 caused a staggering 61% increase in nominal market price, implying an annual average price of R47.20 per 10kg bag. Under the assumption of stable weather conditions from 2017 onwards, the average nominal market price for a 10kg bag of potatoes is projected to decrease back to R31.00 (34%) in 2017. After the initial decrease in 2017, the average real market price of a 10kg bag of potatoes is projected to decrease by an annual average of 1% over the outlook period.

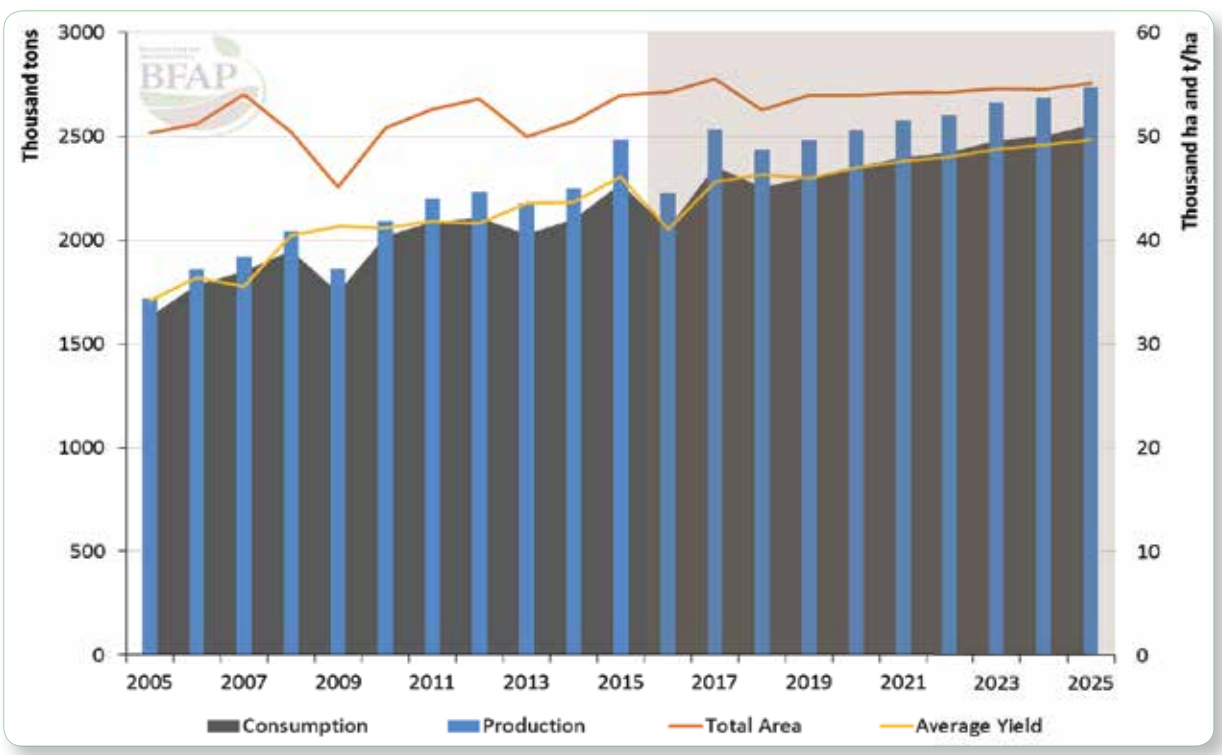


Figure 88: *Potato supply and demand balance: 2005-2025*

SOUTH AFRICAN OUTLOOK

Outlook for horticultural products

FRUIT

Modern day agriculture is exposed to an increasingly globalised society and for producers, competitiveness in the global market has become paramount. This rings particularly true in export-orientated industries in the South African fruit sector.

Fruit

Modern day agriculture is exposed to an increasingly globalised society and for producers, competitiveness in the global market has become paramount. This rings particularly true in export-orientated industries in the South African fruit sector. Competitiveness is a widely used concept that essentially relates to the ability to deliver goods and services in an alternative market at prices as good as, or better than, other potential suppliers, thus optimising resources. Freebairn (1987) stated that a competitive agricultural export industry is about marketing as well as production costs; it is about all on-farm and off-farm costs of delivering products to international markets; it is about beating alternative suppliers; and it is couched in a dynamic world of changing buyer preferences, advancing technology, and changing relative input costs. Competitiveness therefore essentially encapsulates all factors related to the ability to keep on trading profitably, growing businesses and securing investments.

Given that South African fruit industries operate in an export-orientated milieu, the Relative Trade Advantage (RTA) presented in Figure 89 provides a proxy for competitive performance, with a higher RTA pointing to a more competitive industry. It highlights 5 distinct phases since 1961, as South Africa moved from a highly regulated single channel export marketing system (Phase 1), through a period of political sanctions that impacted negatively on trade performance (Phase 2) and ultimately a period of deregulation and economic freedom (Phase 3). This period included the lifting of sanctions and presented unrestricted access to lucrative export markets. During phase 4, South African fruit and wine exporters gained experience and continued to improve their competitiveness, yet this period culminated in the 2007/08 'economic meltdown' globally and as the Rand strengthened, the trade environment also normalised. Exporters were also faced with the need to comply with a growing number of stringent technical and environmental standards and ultimately gained an improved understanding of business strategies required to compete on a global playing field. Over the next decade, phase 5 will continue to be shaped by export strategies currently being developed. Given the dampened macroeconomic environment, clear strategies that engage all stakeholders, boost innovation and ultimately improve productivity are critical to maintain and enhance competitive performance.

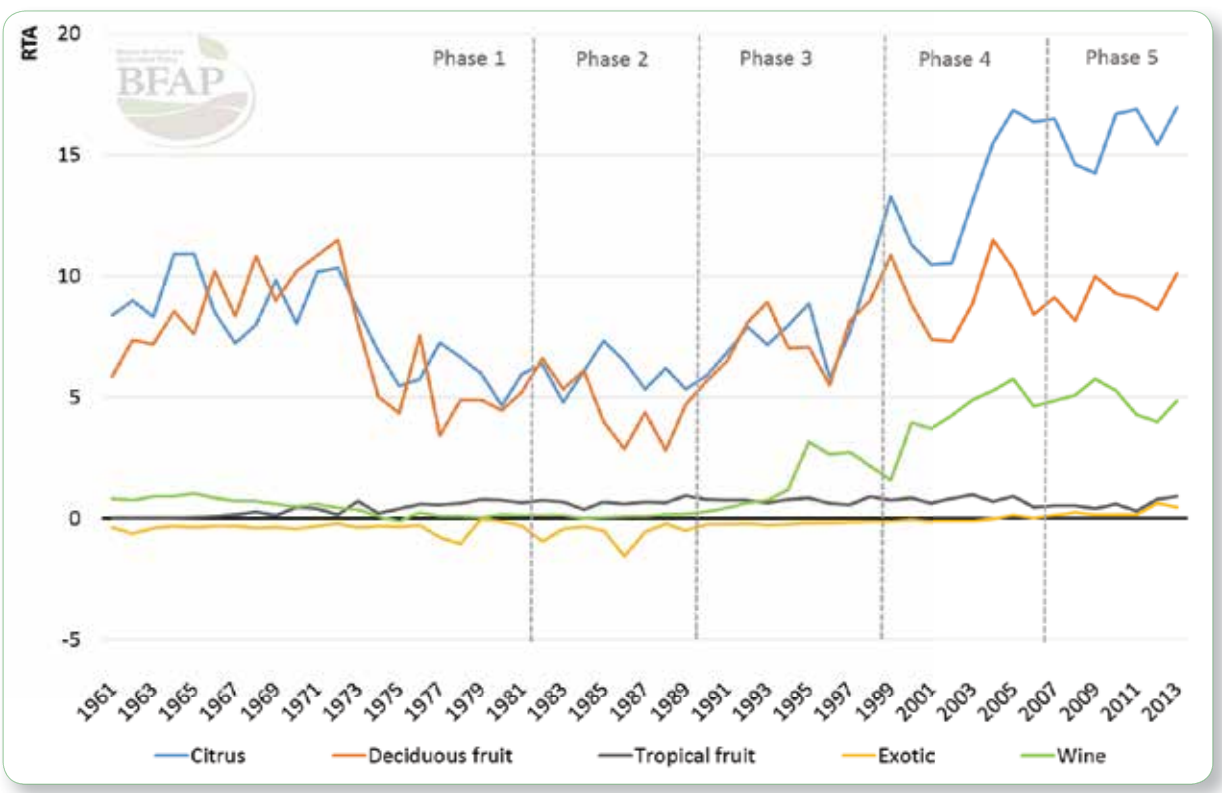


Figure 89: *Competitive performance of South African fruits and wine*

BOX 11.1: Export strategy developed through the Fruit Industry Round Table

Within the context of competitiveness and the pivotal role of international trade in the export orientated fruit and wine industries, the Fruit Industry Value Chain Round Table (FIVCRT) is leading the process of completing the accord emanating from the Fruit Industry Social Compact (FISC). The FIVCRT is a partnership (principle commitment) between government, the fruit industry and labour with the objective of fostering collaborative industry-government actions to secure an enduring competitive advantage of the South African fruit sector. The FIVCRT aims to involve all critical role-players within the entire fruit value chain by providing cooperation and partnerships to achieve socio-economic growth within the industry according to the National Development Plan.

Each of the five Fruit South Africa (FSA) members convenes a Working Group and the synergies between the various working groups across industries explicitly focus on a holistic approach to enhance competitiveness. Missions on trade strategy proposals to foster partnerships, export product diversification, open market access, competitive repositioning onshore, incubation of a higher skills base, along with local and regional infrastructure development.

In collaboration with the Directorate of International Trade within DAFF, the FIVCRT has identified a number of key markets to be addressed within export strategy proposals, including China, Indonesia, South Korea, India, Thailand, Japan, EU, USA and Russia. Within these markets, challenges were highlighted, such as sanitary and phytosanitary issues, tariffs, market awareness, political constraints and credit assurance.

Crucial to strategic planning is the identification of priorities. In total, 18 priorities were flagged – two for each of the nine markets. Phytosanitary constraints scored top priority in six markets, namely China, South Korea, Japan, Thailand, EU and USA. Tariff constraints scored top priority only in India and second in South Korea, Thailand and the USA. South African product (brand) awareness scored top priority in the Indonesian and second in Japanese and Chinese markets, whilst sanitary constraints also scored top priority in the Russian market and second in two markets, India and EU. Political constraints in Indonesia and credit assurance in Russia each scored second priority.

South African is well organised to formulate plans, but less organised to implement them. Strategic direction is therefore critical, not only in planning, but also execution, implementation and control. Role identification and responsibility allocation amongst government and industry stakeholders are critical steps towards addressing the challenges listed, in order to promote agricultural trade and enhance competitive performance of the sector as a whole.

Market Attractiveness Analysis for South African fruit exports

Strong growth in fruit exports in recent years has allowed the sector to make a positive contribution to economic growth and job creation. Aggregating total exports of apples, pears, peaches, plums and apricots from South Africa into the global arena, Figure 90 shows a clearly expanding trend evident in most regions of the world. The export value of these selected fruit products has grown from approximately R33.3 billion in 2001 to R164.8 billion in 2015, which translates into an annual growth rate of 12.1% over this period (ITC, 2016). Traditionally Europe and America are the biggest markets for South African fruit, though exports to Asia, the Middle East and Africa have seen strong growth in recent years. This highlights the importance of developing robust export strategies as attractive market opportunities shift over time as various market conditions and requirements change.

In order to gauge the world fruit market for potential attractive markets destinations, the Market Attractiveness Index (MAI) from the International Trade Centre's (ITC) is applied. A composite index such as the MAI is formed by compiling individual indicators into a single indicator, in this case measuring various aspects that indicate increased opportunities for exports of fruit products from South Africa. However, in this year's Baseline an augmented version of the MAI is developed which is tailored specifically to include aspects more intrinsically associated with agricultural products. The different indicators applied in the new approach includes those associated with the Country Demand Index such as seasonality of imports, market growth in physical tons and the relative price realisation in the prospective importing country (Figure 91). The Market Access Index remained unchanged and includes tariffs, distance advantages and total fruit trade. The MAI was calculated for apples (HS[1] 080810), pears (HS 080830), peaches & nectarines (HS 080930), plums (HS 080940) and apricots (HS 080910).

[1] The international Harmonised System (HS) codes were applied

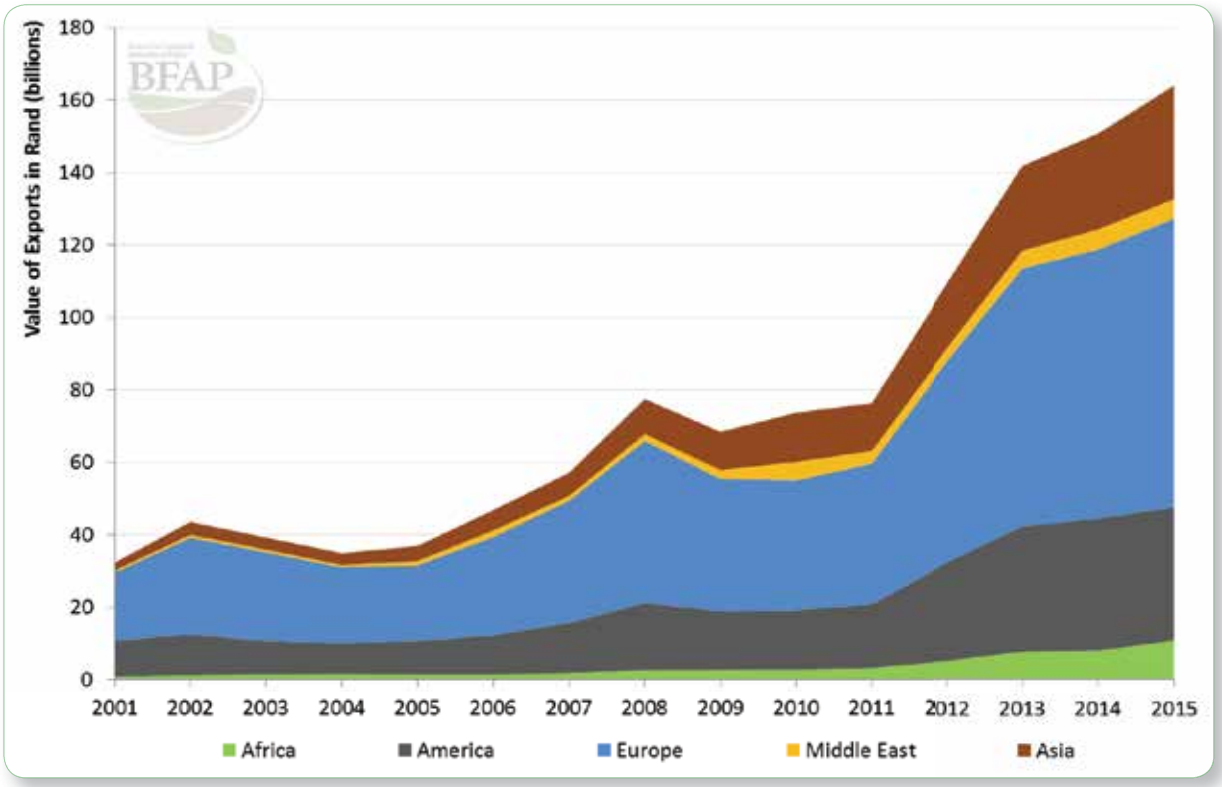


Figure 90: *South African exports of selected fruit products, disaggregated by market (2001 - 2015)*
Source: ITC Trademap, 2016

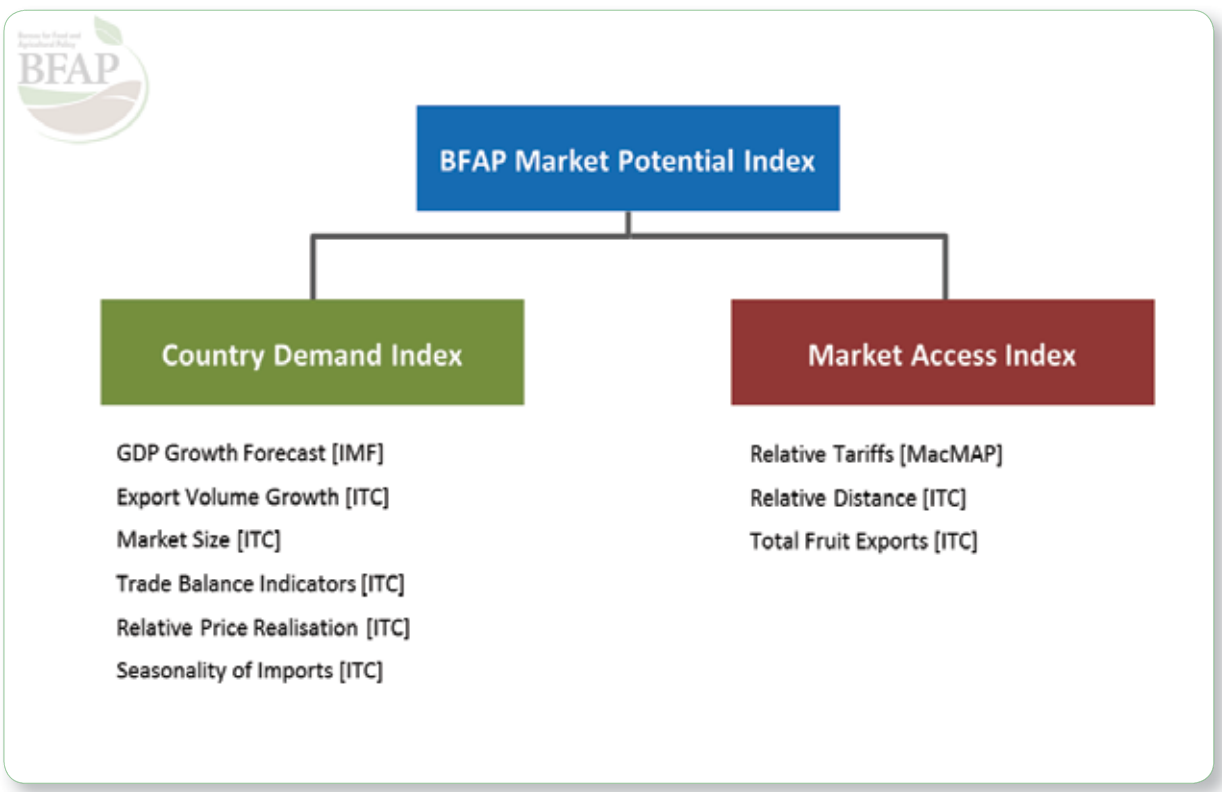


Figure 91: *The MAI framework*
Source: ITC, 2016

Apples

South Africa has seen strong growth in apple exports and has grown its share in the world market for apples from 2.6% in 2001 to more than 5% in 2015 (ITC, 2016). The MAI results in Figure 92 show the attractive market destinations for South African apple exports and indicate markets which could provide further growth prospects in the future. The top 5 most attractive markets are the United Arab Emirates (UAE), Saudi Arabia, Malaysia, the United Kingdom (UK) and India. It is clear from the list of the highest ranking attractive markets that South Africa is already participating in the majority of these growing markets. Other notable attractive markets include Singapore, Qatar and the Netherlands, while the African markets of both Djibouti and Nigeria were amongst the top ten. Strong growth in certain Asian, African and Middle Eastern markets in the past 5 years suggest ample opportunities going forward.

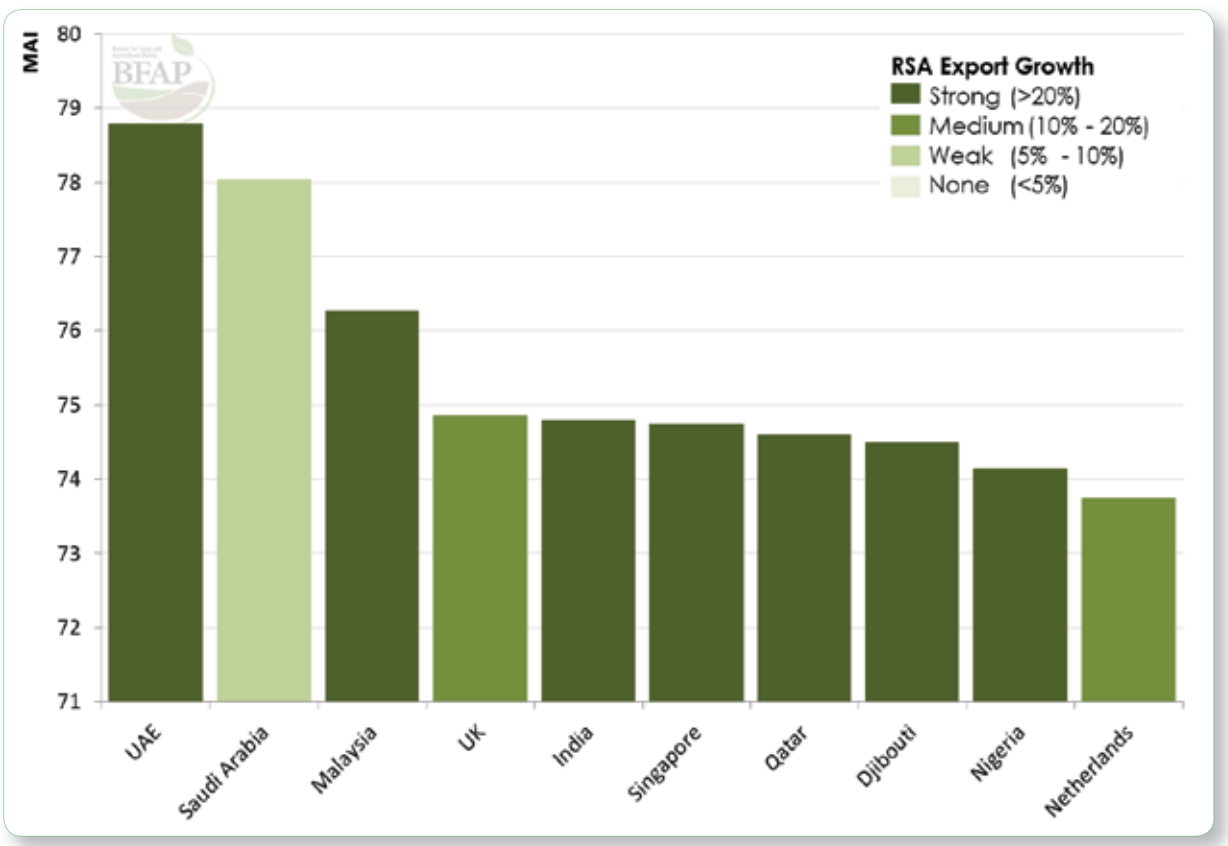


Figure 92: *Top10 attractive markets for apple (HS 080810) exports from South Africa*

Pears

South Africa has expanded its share of the world pear market from 2.7% in 2001 to 6.9% in 2015 (ITC, 2015). This good export performance comes off the back of strong growth in both Asian and Middle Eastern markets in the past five years, each growing at 9.6% and 8.8% per annum respectively (ITC, 2016). The MAI results show that the main attractive markets for South African pear exports are the UAE, Saudi Arabia, Tanzania, the Netherlands and Russia. South Africa has seen strong growth in nine of the top ten markets listed in Figure 93 as indicated in the darkened green bars. The Netherlands remains the biggest buyer of South African pears entering European markets

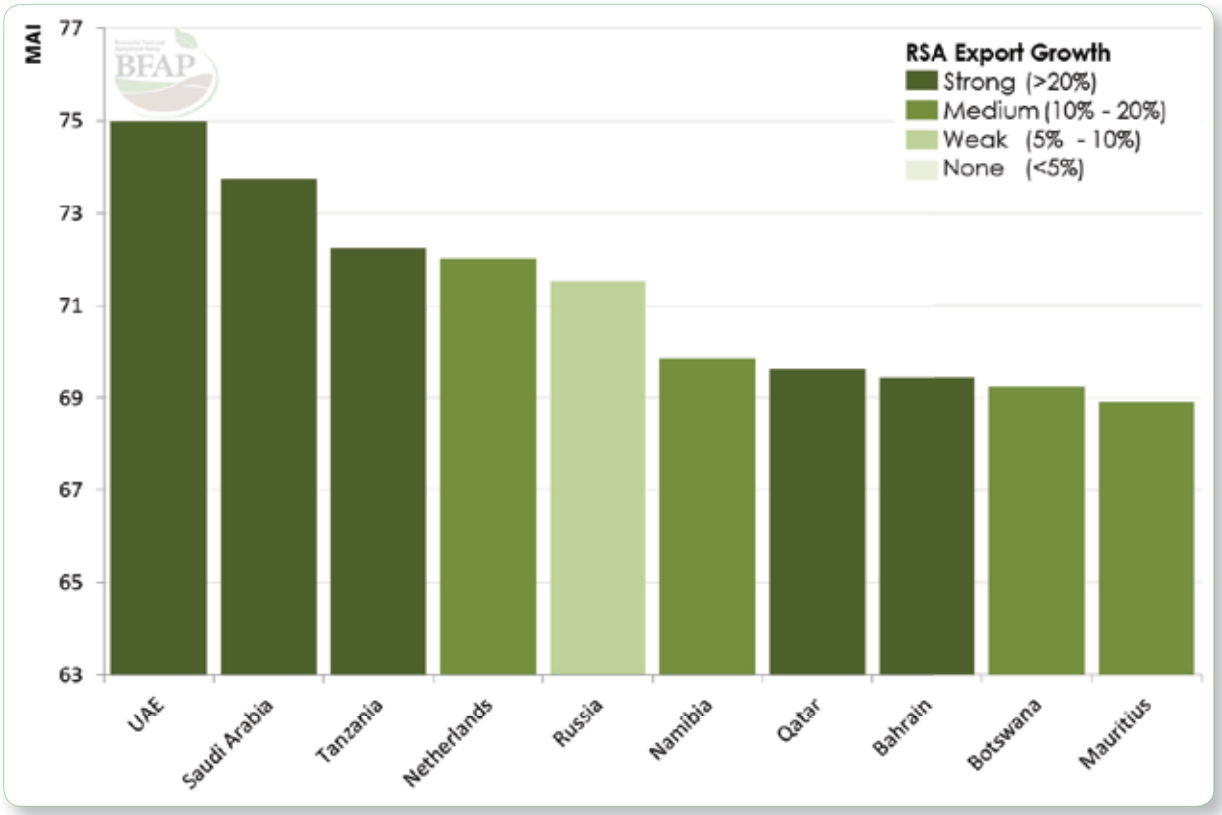


Figure 93: *Top 10 attractive markets for pears (HS 080830) exports from South Africa*

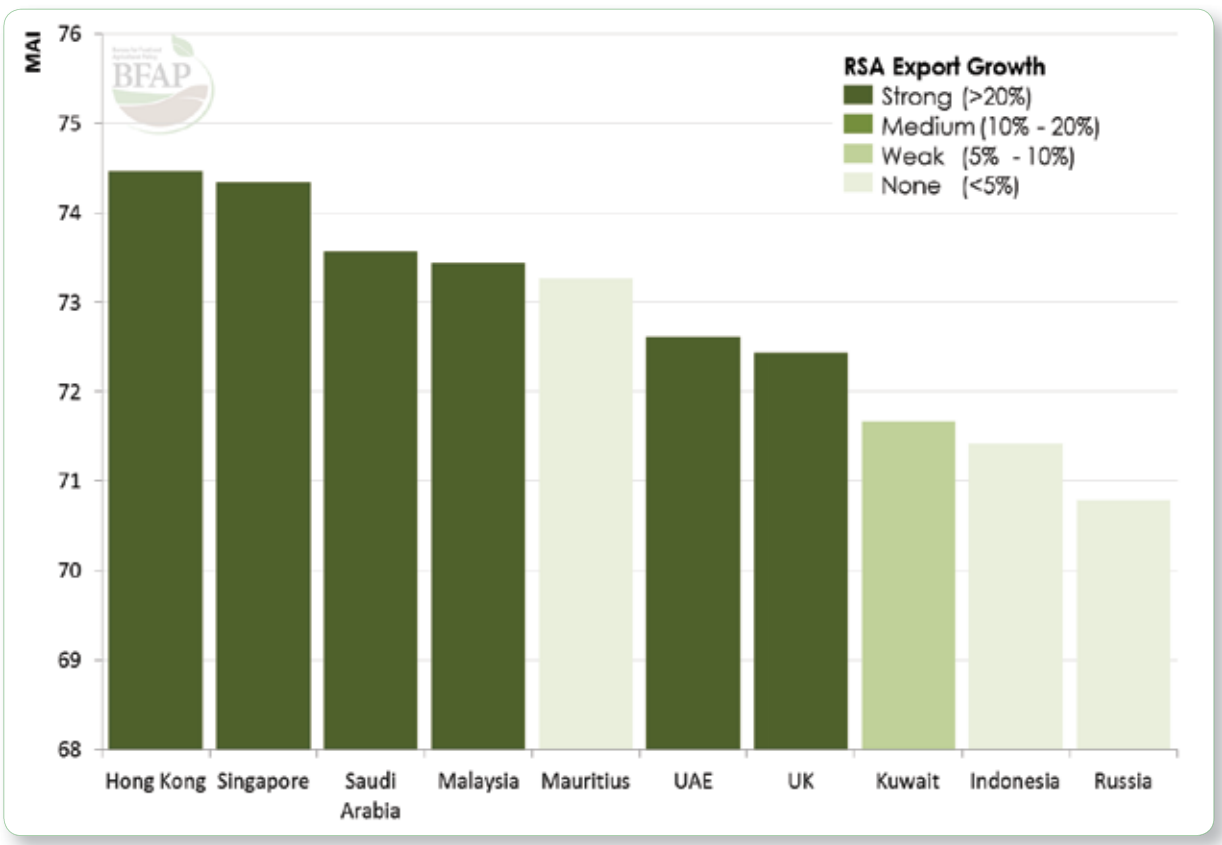


Figure 94: *Top 10 attractive markets for peach & nectarine exports from South Africa*

Peaches and nectarines

World peach & nectarines imports have grown considerably in the past decade as have South African peach exports. Even though South Africa only supplies a small fraction (1.4%) of the world market for peaches and nectarines in 2015, it remains well placed to expand its exports going forward. Europe remains the main destination for peaches and nectarines, while Asia and the Middle East have shown strong growth in the past 5 years. The top attractive markets were Hong Kong, Singapore, Saudi Arabia and Malaysia (Figure 94) and it is clear that these are fast growing markets for South Africa with growth rates exceeding 20% per annum. The UAE and the UK are also listed in the top 10 attractive markets, while it should be noted that a market such as Indonesia will offer new opportunities for peach and nectarines exports with the latest bilateral agreement to export peaches from South Africa directly into the Indonesian market through Jakarta.

Plums

South Africa is currently the 3rd largest exporter of plums and has a world market share of 10.4%, behind Chile and Spain (ITC, 2016). The majority (46%) of world plum imports are destined for European markets such as the UK, the Netherlands and Germany. Asia is the fastest growing region of plum imports with the value of imports increasing from R590 million in 2001 to R4 billion in 2015. The MAI results presented in Figure 95 indicates that Hong Kong, the UAE, Singapore, Malaysia and the Netherlands make up the top five, while both Saudi Arabia and the UK follow in 6th and 8th position respectively, mainly due to higher price realisation and strong demand growth. Markets such Mauritius and Zimbabwe were growing African markets accessible to South Africa exporters.

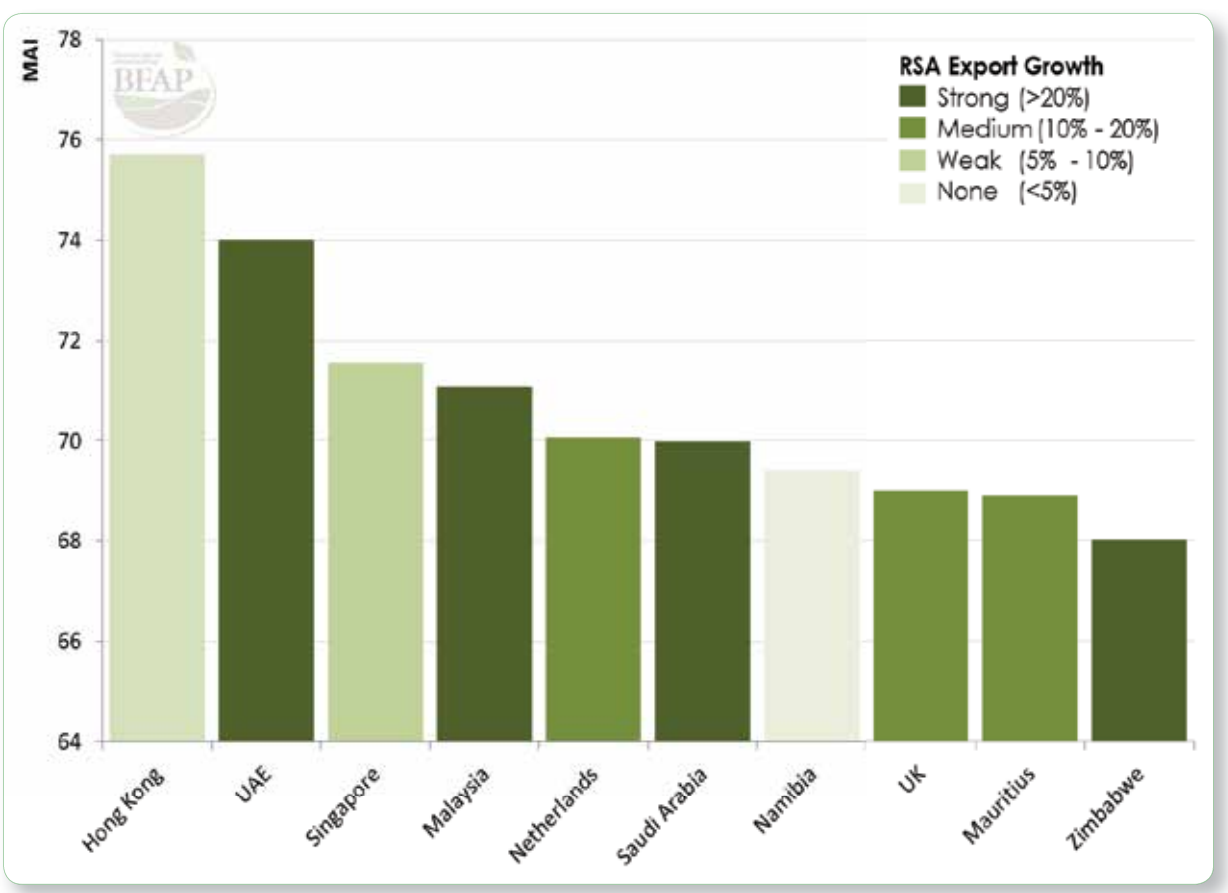


Figure 95: *Top 10 attractive markets for plum (HS 080930) exports from South Africa*

Apricots

Global apricot imports increased from R1.5 billion in 2001 to R5.6 billion in 2015, at an annual growth rate of 9.8% (ITC, 2016). South African exports of apricots do not show a similar trend, which is today lower than the highest peak realised in 2008 and reveal high volatility from year to year. Furthermore, the export values for apricots are significantly lower than that of the other fruit products with the biggest importer being the UK with an export value of R22 million, which is the equivalent of 33% of all apricot exports (ITC, 2016). The MAI results in Figure 96 shed some light on opportunities for market expansion with only Hong Kong, Namibia, the UK and Kuwait holding growth potential for South African exports. These markets are characterised by strong import growth and relatively favourable market access conditions. Kuwait, together with Singapore, seem like attractive market destinations although comparatively small volumes of South African apricots have entered these markets in the past 5 years.

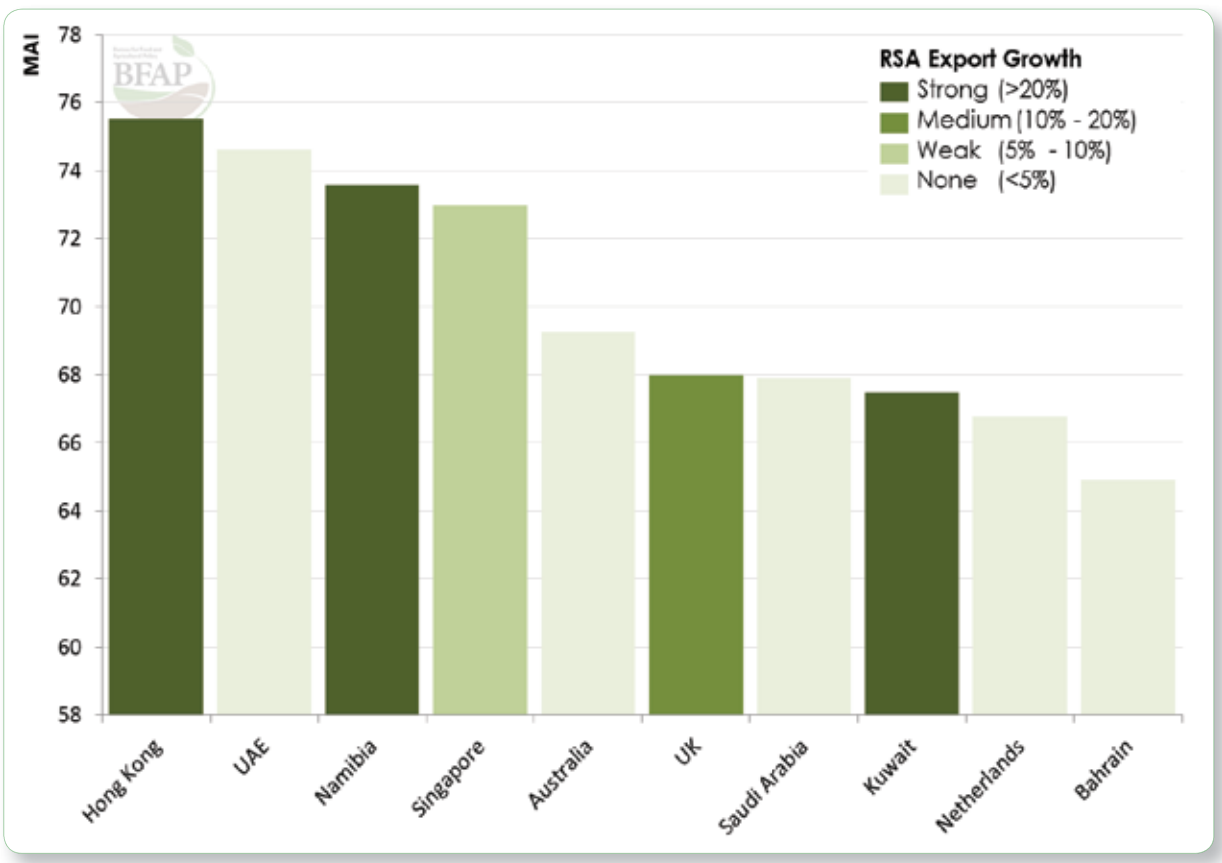


Figure 96: *Top 10 attractive markets for apricots (HS 080910) exports from South Africa*

South African fruit industry tariff analyses

While the evaluation of market attractiveness suggests there is ample room for expansion, South Africa's competitiveness in many possible destinations remains constrained by unfavourable tariff rates. In a recent study, the Directorate of International Trade (DAFF) evaluated the potential competitive disadvantage for South African fruit and tree nut exports to key Asian markets. South Africa was shown to experience a competitive disadvantage and does not have any preferential market access to these key Asian markets, except for the Generalised Scheme of Preferences (GSP) to some markets, which is similar to Southern hemisphere competitors. Various fruit export competitor countries, such as Chile, Peru, New Zealand and Australia, have already negotiated preferential tariffs in key Asian markets.

The approach started with the identification of a grid of competitors to South African fruit exports, including key Asian markets important for each main fruit type. A list was compiled based on competitor analysis, where competitors had a preferential tariff advantage over South Africa. Substantial trade flows from competitors further highlighted areas where South Africa faces serious competition due to tariff disadvantages resulting in possible price handicaps in the markets (Table 10).

South Africa's disadvantage pertaining to preferential tariffs of competitors for apples mostly relates to New Zealand and Chile. New Zealand has preferential access for apples to China and Taiwan. Chile enjoys preferential access for apples to China. For grapes competition is mostly from Chile and Peru, where again, Chile enjoys duty free access for grapes to China, Japan and Korea. Peru has duty free access for grapes to China and Thailand. For both plums and avocadoes, Chile has a tariff advantage in the Chinese market. The outlook presented in this chapter is based on the assumption that these tariffs remain unchanged and therefore it could be improved by a more favourable tariff structure in growing Asian markets. Importantly, it also assumes that South Africa retains its current access to the UK market, which will need to be renegotiated urgently following the BREXIT referendum.

Pome fruit industry outlook: apples and pears

The apple industry has experienced significant volatility in recent years. The remarkable 2013 crop was associated with record production volumes, high product prices and good quality attributes and represents a season to remember. This was however followed by unfavourable weather conditions in the form of hailstorms, which affected large parts of major production regions in November 2013 and again in 2014, affecting not only the yield and quality but also the 2015 harvest as bearing spores where affected.

Climatic challenges remained a factor as the drought conditions and extremely high temperatures in December 2015 and January 2016 altered and provoked irrigation management strategies and innovations. These included experiments with kaolin applications, which reduce the plant's water demand by increasing its photosynthetic rate, to combat the impact of the water shortage as some areas received less than half of what can be considered typical rainfall.

***Table 10**: Comparison of South African export tariffs and values*

Market	Product	Market Imports ('000 US$)	Exporters: Tariff & Export Value					
			South Africa Tariff	South Africa Exports ('000 US $)	Peru Tariff	Peru Exports ('000 US $)	Chile Tariff	Chile Exports ('000 US $)
China	Grapes	603 197	135	5342	0%	85 035	0%	171 362 (28%)
Thailand		114948	43%	0	0%	29 720		
Japan		51 715	17%	0			8.5%	25 017 (48%)
South Korea		189 512	45%	0			0%	126 654 (67%)
Market	**Product**	**Market Imports ('000 US$)**	**South Africa Tariff**	**South Africa Exports ('000 US $)**	**New Zealand Tariff**	**New Zealand Exports ('000 US $)**	**Chile Tariff**	**Chile Exports ('000 US $)**
Taiwan	Apples	244 576	20%	4 380	0%	32 956 (13%)		
China		46 312	10%	25	0%	4 213 (9%)	0%	20 739 (45%)
China	Plums	51 902	10%	45			0%	22 650 (44%)
China	Avocado	11 956	25 %	0			0%	74

Source: Directorate International Trade (DAFF), 2016

The pome fruit industry's export orientation implies that quality, consistency and continuity in fruit products play a pivotal role. In light of the drought's impact, declining production volumes, along with some quality issues related to phytosanitary and internal browning raised concern for export propositions. At the same time, prevailing stock levels in export markets and the effect of the considerable depreciation in the value of the South African Rand will support relatively higher returns in the short run. As farm-inputs are also US Dollar derived, the price-cost squeeze remains evident going forward.

Production

Pome fruit production in South Africa exhibited a constantly upward trend from 2006 to 2015 on the back of increasing bearing hectares. Apple production grew by 46.7% over this period, whilst pear production increased by 24.8% (Figure 97). By 2015, the South African pome industry produced 16% and 25% of the total Southern Hemisphere crop for apples and pears respectively. Southern Hemisphere pome fruit production is expected to decline by 1.5% to a level of 5300 metric tons for apples and by 8.2% to a level of 1400 metric tons for pears (WAPA, 2016).

Further expansion of South African pome fruit area remains constrained by climatic conditions, chilling requirements and water availability. Consequently it is expected that the apple bearing area will increase only marginally (4.1%) over the next decade. Nevertheless, production is projected to sustain an upward trend, as continuous technological innovations such as improved rootstocks and scions/clones which are proven to be more tolerant to apple viruses and diseases drive increasing output per hectare. By 2025, apple production is projected to surpass 1 million tons, an increase of approximately 11% over the 10 year period. The bearing area for pears is expected to increase slightly (7.1%) over the outlook period, with production projected to increase by 13% to touch levels of 460 thousand tons by 2025.

Market distribution

Exports represent the highest value market and have consequently been the focus of apple producers over the past decade. Quality, consistency and continuity is paramount however and the impact of adverse climatic conditions is clearly evident in the production distribution of both apples and pears illustrated in Figure 98 and Figure 99 through

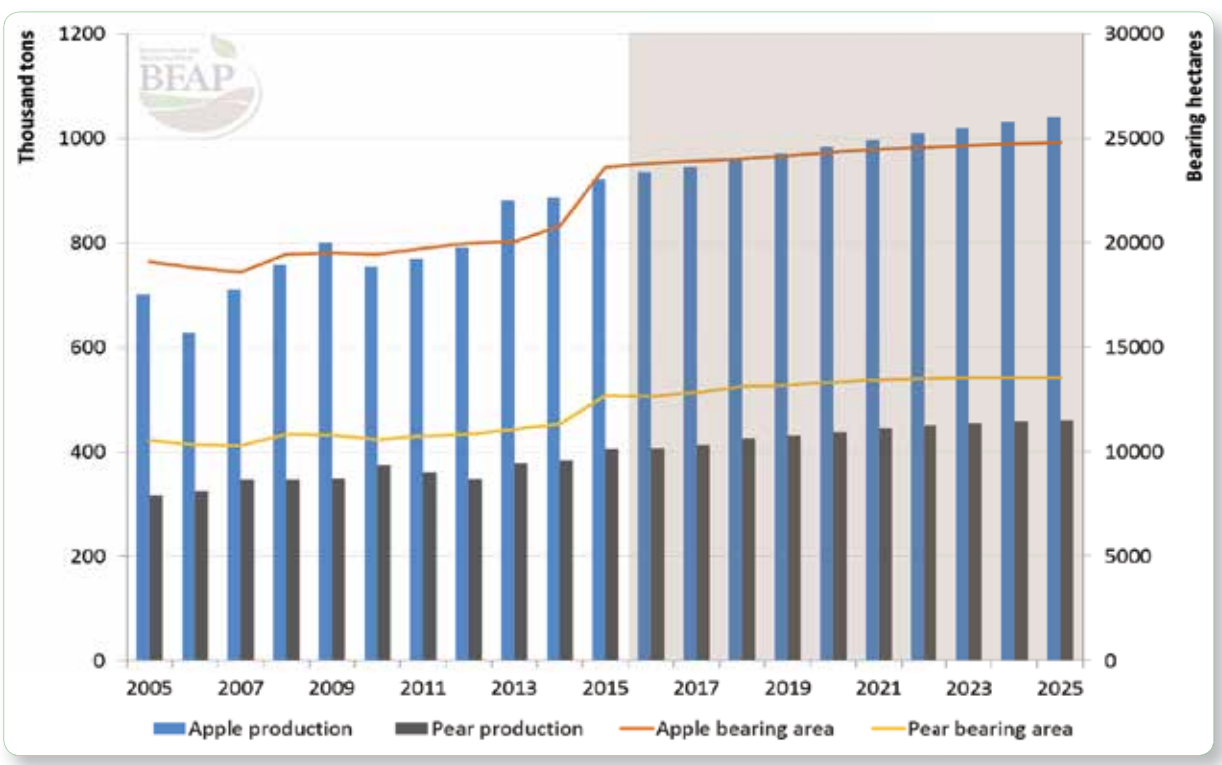


Figure 97: *Bearing hectares & Total production of South African Pome fruit: 2005-2025*

the 2013, 2014 and 2015 seasons. In 2014, the share of total production entering the export market dropped 10% to account for only 37% of the total market. This decrease is mostly attributed to the impact of climatic conditions and can be viewed as an outlier as this share increased to 45% for the 2015 season. It is anticipated to stabilise at approximately 44.5% over the medium term, reflecting the assumption of constant weather conditions, yet the domestic market has been proven a sound demand base able to absorb apples in the event of barriers to exports.

Pear production also remains mostly export orientated, arguably even more so than in the apple industry. Historically, the share of domestic pear production entering the export market has been more stable; the share of exports in the final marketing mix has remained relatively constant at around 49% of domestic production since 2010 (Figure 99). This trend is set to continue over the next decade and while the total volume of exports is projected to increase, the share of domestic production entering the export market will be maintained at approximately 50%. The expected decrease in the domestic market share is transferred to the processed and dried segment as international competitors such as Greece are superseded by homebound processors within a growing international demand.

Exports

Exports flourished in 2013, which was a remarkable season both in terms of volumes and prices. Unfortunately it was followed in 2014 and 2015 by severe climatic constraints, firstly in the form of hail and then more recently the lack of sufficient water for irrigation purposes. Substantial depreciation in the value of the Rand at the end of 2015 boosted the competitiveness of high quality South African fruit in the export market, which exhibited relatively firm demand.

Over the course of the next decade, exports are projected to increase by almost 11% from the 2015 levels of 413 thousand tons (Figure 100). The efforts of the FIVCRT will be crucial to incubate market access and trade negotiations aligned with the Fruit Industry Social Compact. Pear exports are projected to increase even more, expanding by 22% to surpass 230 thousand tons by 2025.

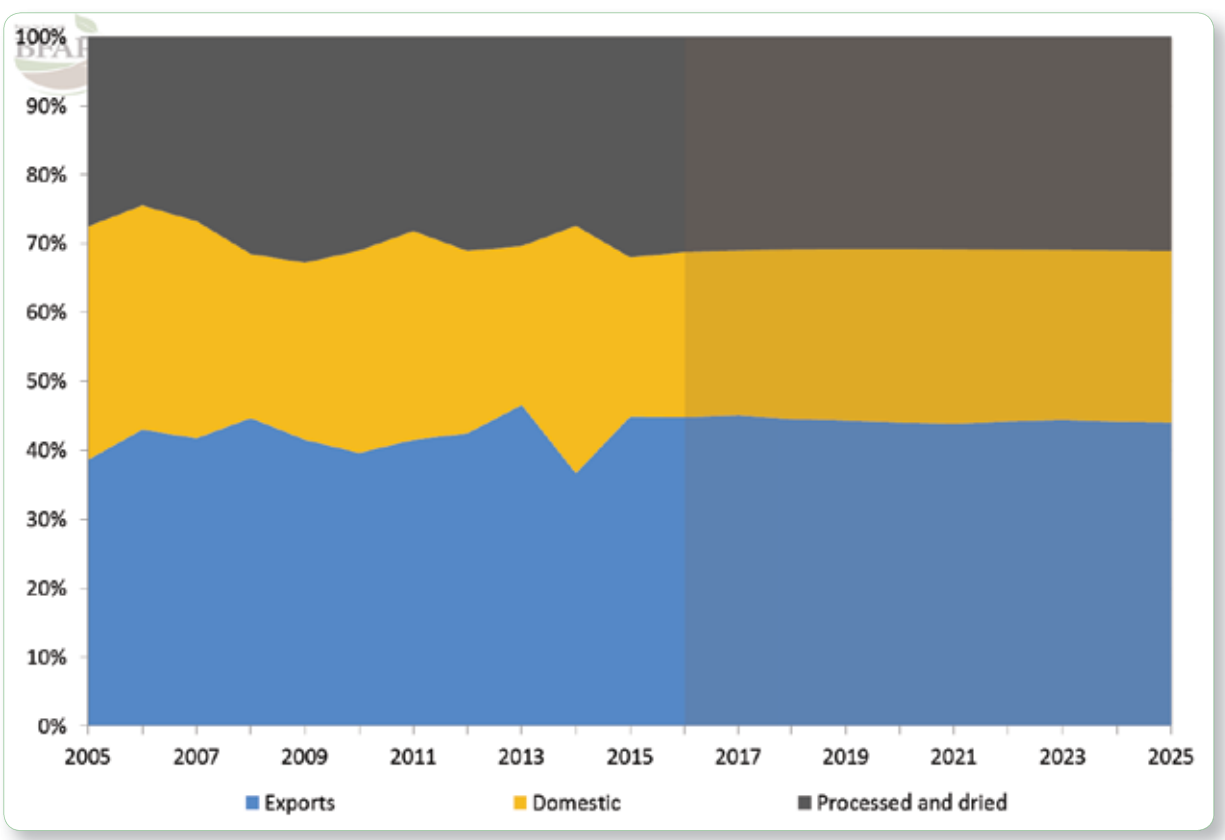


Figure 98: *Production distribution of Apples: 2005-2025*

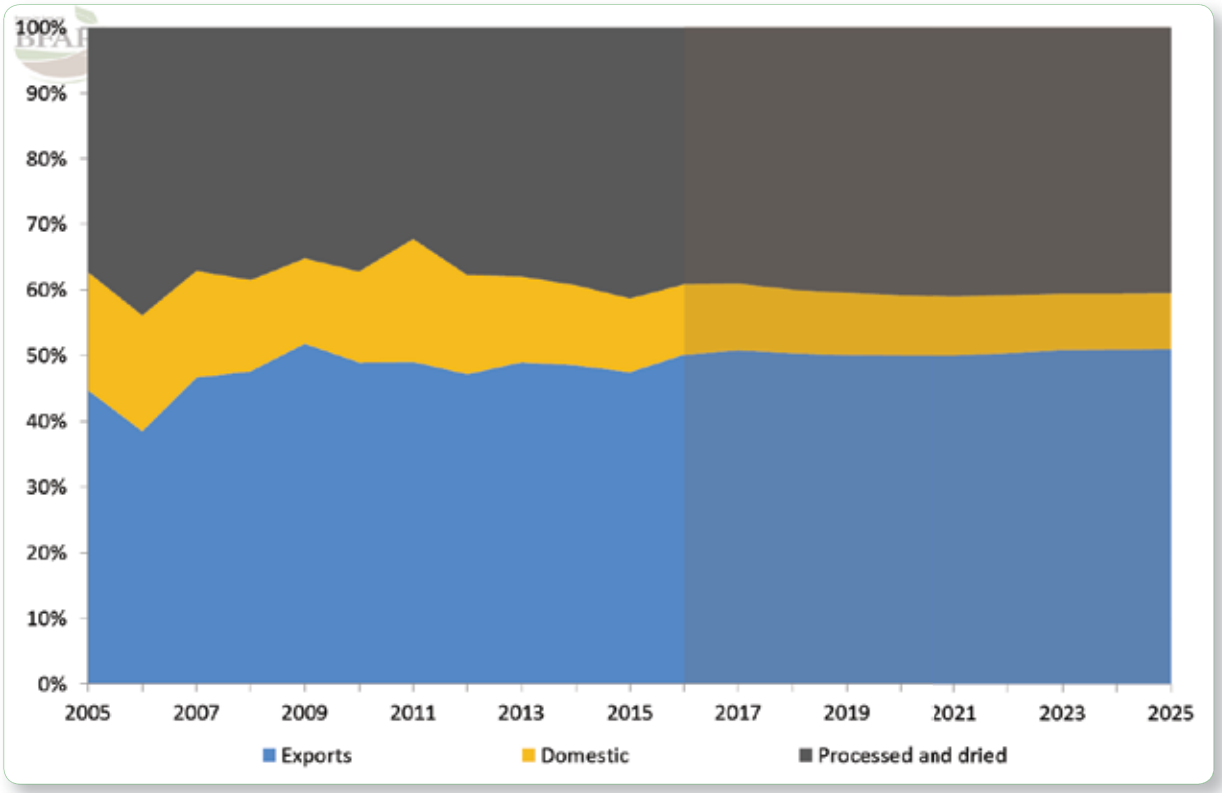


Figure 99: *Production distribution of Pears: 2005-2025*

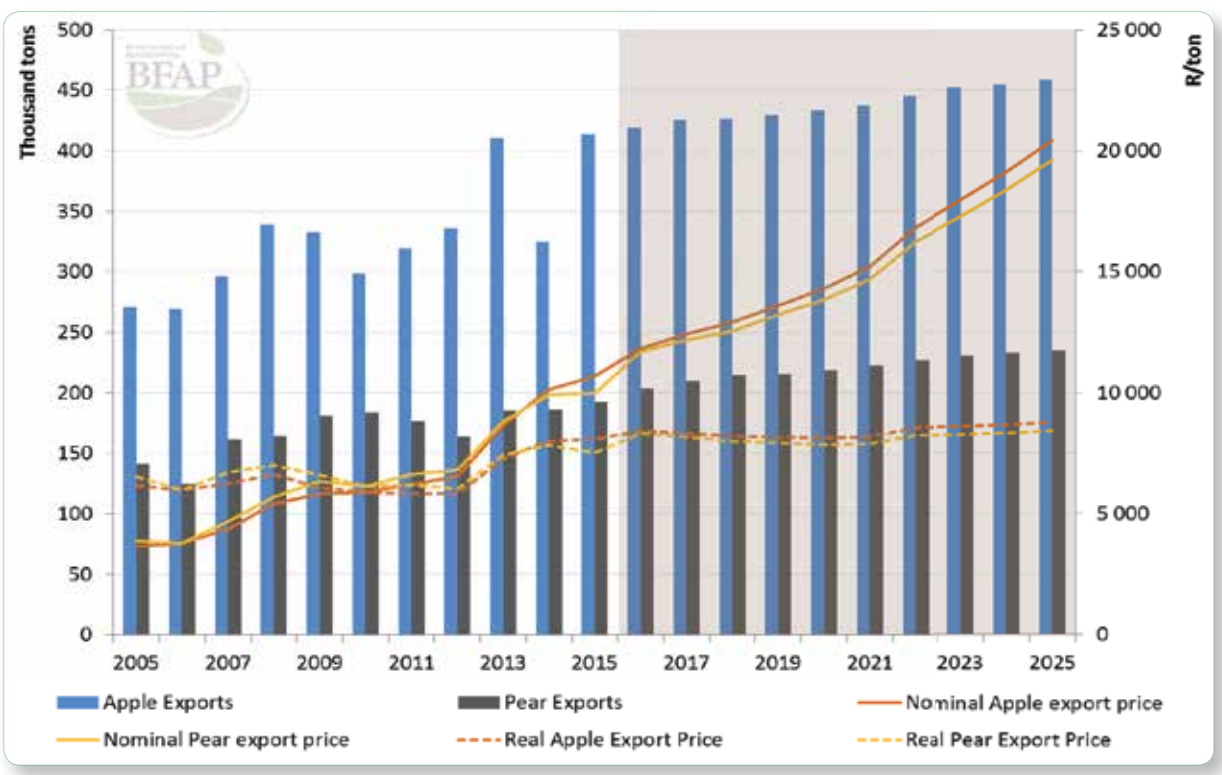


Figure 100: *Pome fruit Export volumes and prices: 2005-2025*

Domestic consumption

Figure 98 and Figure 99 suggest that the domestic market for apples in South Africa is more elastic than that of pears, implying that in the apple market, a larger share of produce not fit for exports can be absorbed by this growing domestic market. However, South African consumers also demand produce of quality, consistency and continuity and hence these factors cannot be ignored. Domestic pear consumption is projected to decrease marginally from 45 thousand tons in 2015 to below the 40 thousand mark by 2025. By contrast, apple consumption is projected to increase from 213 thousand tons past the 258 thousand ton mark, growth of 21% (Figure 101 and Figure 102).

The outlook for market prices, both locally (Figure 101) and internationally (Figure 100), remains positive reflecting a marginal increase even in real terms. This suggests some relief for producers in combating the proverbial price-cost-squeeze. Investments tend to follow product prices as proxies for willingness to undertake risk and hence to establish and replace orchards.

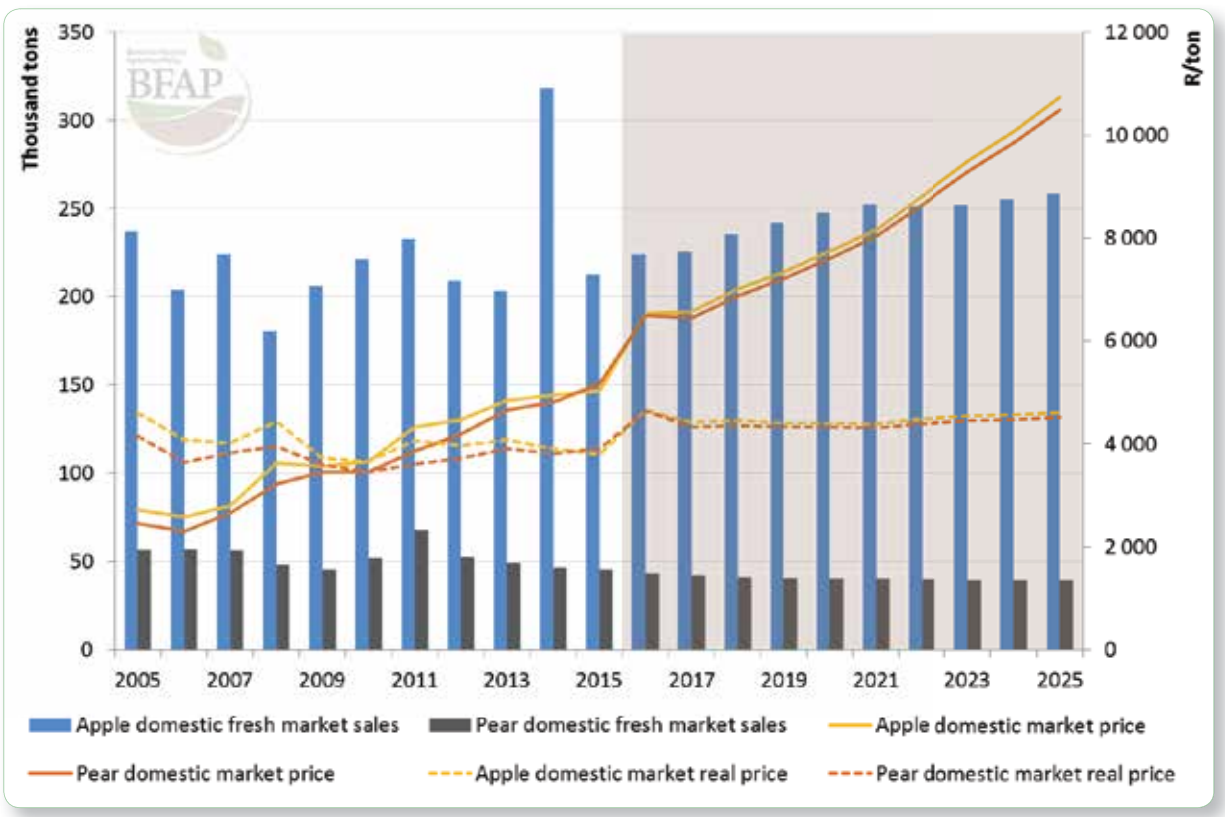


Figure 101: *Domestic market supply and prices: 2005-2025*

Figure 102: *Domestic consumption and sales: 2005-2025*

Farming systems analysis: Commercial deciduous fruit farming in SA

Apple and pear producers operate in a particularly uncertain decision making environment, facing continuous change such as dynamic technological innovations, exposure to international markets as well as changing national and international legislation and regulations. The sustainability of pome farming systems will therefore be influenced by economically rational decision-making and the ability to adapt to a changing decision making environment. Not only technical efficiency (like irrigation scheduling, orchard practices, etc.), but also strategic planning and innovative management are important to accommodate trends and drivers of change such as:

- Irrigation dependence - in future the total share of available water to agriculture will probably decline. Furthermore, climate change will have an effect on rainfall and temperatures. Thus the need for optimal irrigation efficiency cannot be overstated. Furthermore, choice of pome cultivars when replacing orchards and even choice of enterprises will become more important as rainfall patterns and intensity change and minimum and maximum temperatures in crucial periods of the production year change.
- The ratio between the cost of labour and capital (like mechanical equipment) will influence employment patterns. The use of specific capital equipment, like mechanical platforms can increase labour efficiency and productivity.
- The share of exports in production implies that the exchange rate is an important driver of the profitability of these crops.
- Fruit production systems have to adhere to specific national and international food safety and environmental legislation and regulations, as well as to standards set by various local and international retailers (e.g. GLOBAL G.A.P.).
- Education and training of farm workers is important,

contributing to, amongst others, higher productivity, better communication and job satisfaction. Investment in quality training facilities and schools (on national and provincial level) will improve the quality of human capital.

- Plant density, tree shape, canopy management and orchard design can contribute to higher production and better quality fruit. The efficiency of activities like thinning, pruning and harvesting will also be influenced by these considerations.
- Netting for shade and / or hail protection could be considered in specific producing areas.
- How the National Development Plan will unfold and materialise, and specifically the effect of the land reform policy and programmes, small farmer development and Agricultural Broad Based Black Economic Empowerment (AgriBBEE) will influence the structure, stability and prosperity of the commercial deciduous fruit farmers. Lack of clarity and various versions of possible land reform increase uncertainty and can amongst others affect the replacement strategies of orchards, employment patterns, food security and export potential of the country.

Implications of the Outlook projections for a prototype apple and pear farm

The FinSim farm level model analyses a given farm business and projects future performance based on the price and input cost projections from the BFAP sector model. The pome fruit FinSim includes up to 36 orchard blocks for apples and also for pears, each block with a variable replacement cycle, age of first bearing and full bearing, as well as variable annual yields, variable production practices, and variable input and product prices. Various categories or classes of output for apples and pears are provided for to accommodate the different cultivar prices in the various market segments.

The analysis presented in this section are based on a prototype farm from Hortgro Services (2016) data and adjusted by a panel of farmers. This prototype farm therefore still relates to a specific set of assumptions (Table 11, Table 12, and Table 13) and is not considered representative of the entire apple and pear industry in South Africa. The results should therefore not be seen as a forecast, but instead in the context of "... what, if ..." scenarios, given the relevant assumptions. The decision maker should be creative and pro-active in evaluating the effect of alternative

Table 11: *Cultivar, area and yield on prototype apple and pear farm (2014/15)*

Cultivar:	**Area**		**Yield (full bearing)**
Apples:	**%**	**ha**	**ton/ha**
Granny Smith	10	12.0	65
Golden Delicious	23	27.6	78
Royal Gala	18	21.6	63
Pink Lady / Rosy Glow	15	18.0	81
Topred / Starking	15	18.0	60
Fuji	12	14.4	65
Braeburn	2	2.4	85
Sundowner	3	3.6	83
Jazz / Kanzi	2	2.4	55
Total	**100**	**120.0**	
Pears:			
Packham's Triumph	35	10.5	70
Forelle	40	12.0	45
Bon Chretien	6	1.8	55
Abate Fetel	10	3.0	60
Beurre Bosc	3	0.9	65
Doyenne du Comice	3	0.9	45
Rosemarie / Cheeky	3	0.9	50
Total	**100**	**30.0**	
Total cultivated area		**150**	

actions and implement those actions that utilize opportunities and follow practices that contribute to a sustainable farming system.

The area and composition of apple and pear cultivars, as well as the respective full bearing yield for each cultivar for the prototype farm, are presented in Table 11. The area of each specific cultivar was further modelled into three blocks of different ages to ensure a representative age distribution of blocks over the specified lifespan of the orchards.

For both apples and pears, the total yield per cultivar is further divided into various market segments, with corresponding 2015 prices per market segment, as indicated in Table 12. These prices are farm gate (net) prices and assume a situation where the packaging of the fruit is done off-farm.

Table 13 explicitly states the assumptions related to the production practices and assumed production cost on the prototype farm. The specified directly allocable variable costs exclude packaging cost.

Table 12: *Market segmentation and farm gate prices on the prototype apple and pear farm (2014/25)*

Cultivar	**Market segment (% of yield)**			**Price in R/ton (farm gate price)**		
Apples:	**Export**	**Local**	**Processing**	**Export**	**Local**	**Processing**
Granny Smith	45	30	25	4 500	2 425	1 500
Golden Delicious	58	30	12	4 500	3 100	1 500
Royal Gala	68	22	10	5 350	2 950	1 500
Pink Lady / Rosy Glow	55	28	17	7 750	3 250	1 500
Topred / Starking	23	65	12	5 250	4 400	1 500
Fuji	55	23	22	6 000	3 000	1 500
Braeburn	58	10	32	5 250	2 250	1 500
Sundowner	63	22	15	7 750	5 650	1 500
Jazz / Kanzi	60	28	12	6 500	3 100	1 500
Pears:	**Export**	**Local**	**Processing**	**Export**	**Local**	**Processing**
Packham's Triumph	58	27	15	4 750	3 350	1 450
Forelle	65	23	12	6 000	3 500	1 450
Bon Chretien	30	55*	15	4 925	3 000*	1 450
Abate Fetel	55	23	22	7 125	3 000	1 450
Beurre Bosc	55	25	20	4 875	2 650	1 450
Doyenne du Comice	58	10	32	6 000	1 700	1 450
Rosemarie / Cheeky	55	26	19	6 375	2 250	1 450

Table 13: *Assumptions related to apple and pear production practices and costs on the prototype apple and pear farm (2014/15)*

Characteristic	**Apples**	**Pears**
Age of first bearing (year)	3	4*
Age of full bearing (year)	7	9**
Replacement age (years)	30	30
Establishment cost (R/ha)	273 594	257 017
Directly allocable variable cost (excluding packaging) (R/ha)	116 459***	98 430***
Fixed and other variable cost for the prototype farm (including permanent labour) (R)	7 344 200****	

* Bon Chretien, Beurre Bosc and Packham's Triumph year 3
**Bon Chretien, Beurre Bosc and Packham's Triumph year 8
***full bearing
****excluding interest on capital, land rent and entrepreneurial remuneration

Performance of the prototype apple and pear farm over the projection period is illustrated by various measures. For each year, nominal values are simulated stochastically over 1 000 iterations, allowing for the calculation of maximum, mean and minimum values, as well as the probability distributions of these performance measures. Selected results are illustrated in Figure 103, Figure 104 and Figure 105.

The maximum, mean and minimum simulated annual gross margin, calculated as the gross production value minus the directly allocable variable costs per hectare for apples and pears, are presented in Figure 103. It is evident that the corresponding gross margins obtained for apples were higher than those of pears over the entire projection period. The differences in the shape, trend and absolute value of the simulated gross margins are attributed to differences in cultivar composition, age of orchard blocks, the assumed yields of the various cultivars of apples and pears and the market and price structure of the various cultivars on this prototype farm. The decline in the gross margins for apples in 2021 and 2022 is not due to a projected decline in nominal prices, but can be ascribed to the other factors mentioned, such as orchard replacements.

Net farm income (NFI) is a performance measure used in profitability assessment and represents the reward to capital, land and the entrepreneur. All other cost items are thus deducted from the gross farm income, except for interest paid on borrowed funds, interest earned on own capital, land rent, land lease and entrepreneurial remuneration. A negative NFI thus implies that the three production factors, namely land, capital and entrepreneurial input receive no reward. The maximum, mean and minimum simulated annual NFI per hectare are illustrated in Figure 104, which highlights the range between which the different iterations of the simulated NFI values varied for each specific year. The general trends tend to follow the projected gross margin for apples presented in Figure 103, which is attributed to the fact that apples represent the main enterprise in this prototype farm (120 ha apples compared to 30 ha of pears).

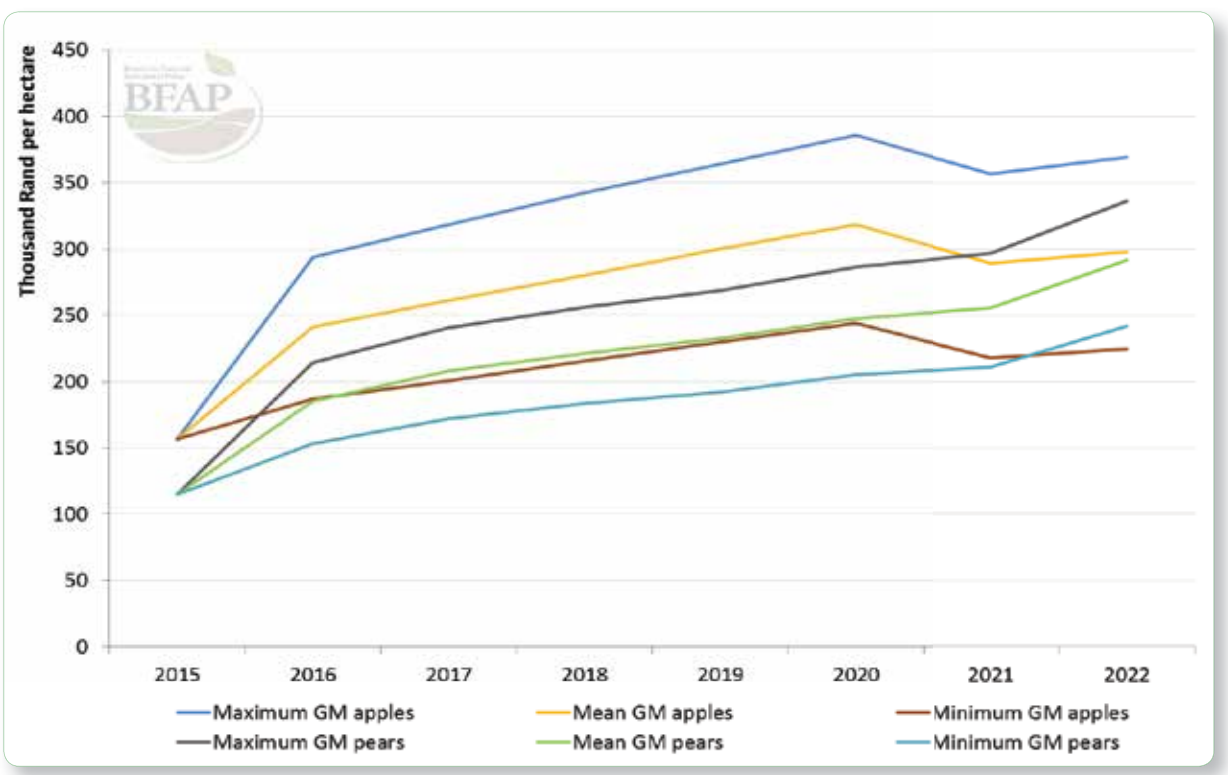


Figure 103: *Maximum mean and minimum simulated annual gross margin (GM) per hectare for apples and pears on the prototype farm*

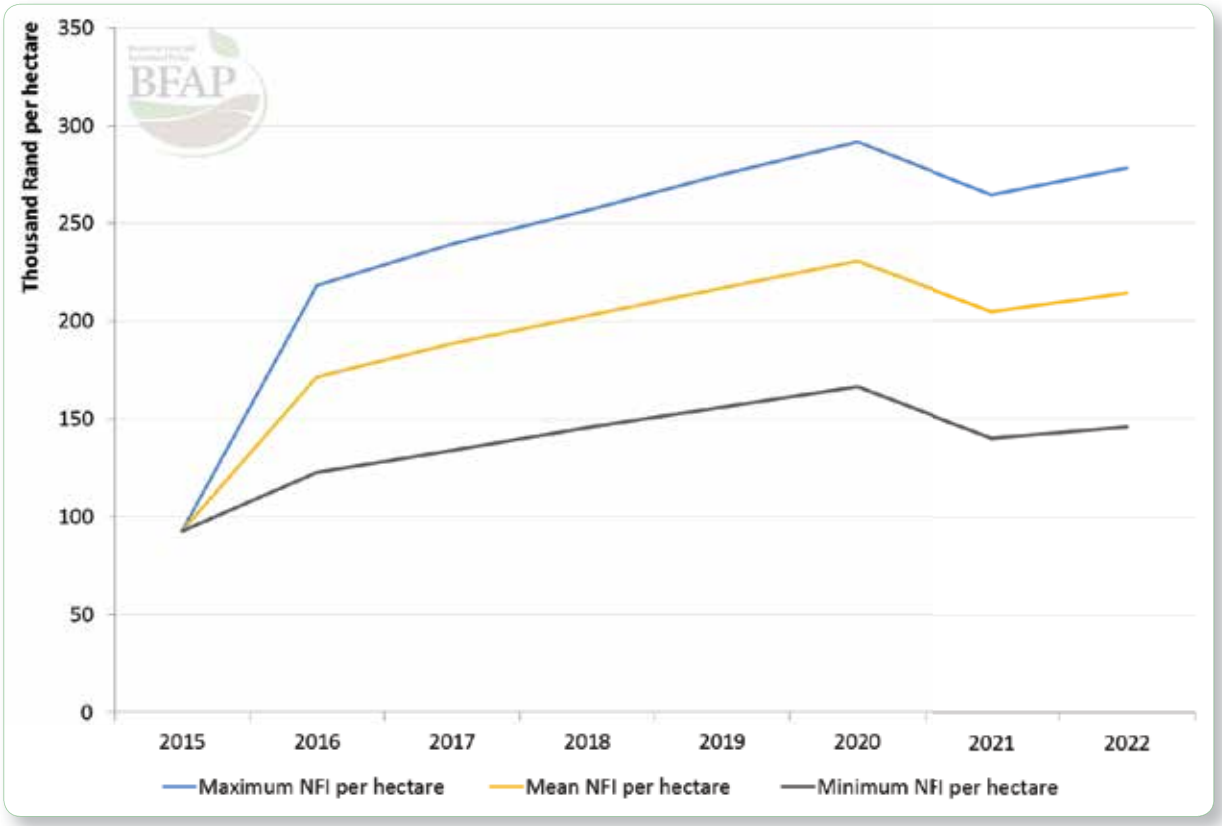


Figure 104: *Maximum, mean and minimum simulated annual net farm income (NFI) per hectare on the prototype apple and pear farm*

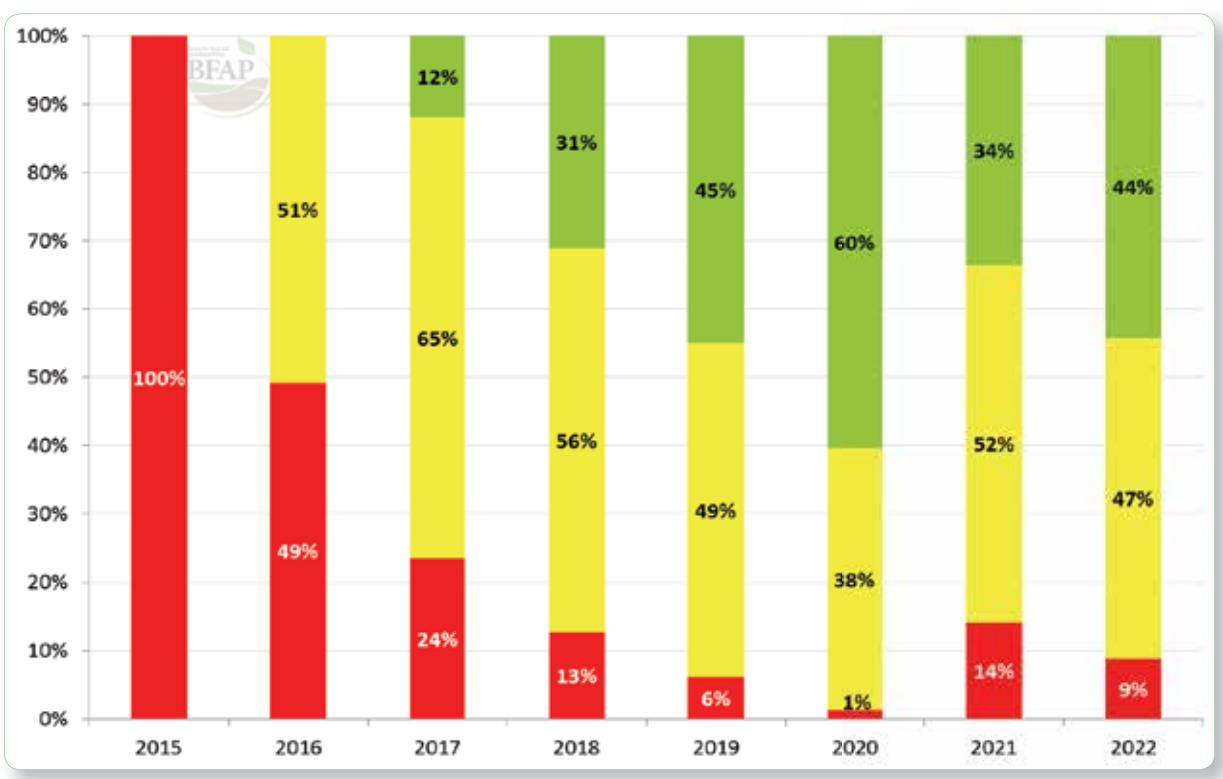


Figure 105: *Probability of obtaining a net farm income (NFI) per hectare betweenR170 000 and R220 000 on the prototype apple and pear farm*

In light of the range of possible NFI levels presented in Figure 104, the probabilities that the annual NFI per hectare for the prototype apple and pear farm fall within a specified range are illustrated in the stoplight chart in Figure 105. The green bars illustrate the probability of obtaining a NFI of more than R220 thousand per hectare, whilst the red bars reflect the probability of obtaining a NFI of less than R170 thousand per hectare. The yellow bars in turn represent the probability of obtaining a NFI of between R220 thousand and R170 thousand per hectare for the specified period.

When interpreting the results, it should be kept in mind that the data in the analyses are in nominal values and that the probability boundaries set in Figure 105 are fixed (in absolute value) over the projection period.

Agri benchmark Horticulture: Performance of apples in the global context

Two prototype apple farms in South Africa form part of the agri benchmark Horticulture network, namely in the Ceres (120 ha) and in the EGVV (Elgin, Grabouw, Vyeboom and Villiersdorp) (80 ha) regions. The cultivar composition and full bearing yields are presented in Table 14.

Figures 106 and 107 present some of the results from the agri benchmark horticulture network, providing comparisons between participating countries.

The average yield per hectare and gross revenue per ton for the prototype farms are indicated in Figure 106. The size of the respective prototype farms is also listed in the figure and differs widely, with only one German and the two South African prototype farms that are relatively large and have comparable average yields. The average yields for the two South African prototype farms were considerably higher for the exceptionally good 2013 harvest. Amongst others hail in the Ceres region had a negative effect on yields and quality in the 2014 season. The hail damage influenced the grading and price of apples.

The gross revenue per ton on the South African prototype farms was considerable lower over the period 2010-2014 than for the European countries. This can be ascribed to the fact that the gross revenues for the South African prototype farms are based on farm gate prices.

The total cost and gross revenue for the prototype apple farms are indicated in Figure 107. The total cost and gross revenue (both in € per ha) were the highest on the relative small prototype apple farms (Switzerland and Italy), while lower on the prototype farms of Germany. The total cost per hectare on the Chilean and South African farms was lower than on the prototype farms of the other three countries. The gross revenue per hectare for the German, Chilean and the EGVV South African farms was comparable, but lower for the Ceres prototype farm due to the hail damage.

The directly allocable cost is comparable between the various prototype farms, except for the one in Switzerland. The overhead cost for the prototype farm of Chili was the lowest. It is clear from Figure 107 that on most of the prototype apple farms all the cost items could not be covered by the gross revenue. It was only the prototype farm of Chile and EGVV South Africa where an economic profit could be realised.

Table 14: *Area, cultivar and yield for two prototype South African apple farms for agri benchmark Horticulture, 2014*

	Area (%)		Yield (full bearing)	
Production region	**Ceres**	**EGVV**	**Ceres**	**EGVV**
Cultivar:	**%**	**%**	**(ton/ha)**	**(ton/ha)**
Granny Smith	13	21	44	55
Golden Delicious	22	25	64	60
Royal Gala	15	14	45	54
Pink Lady / Cripps Pink	15	10	54	64
Topred / Starking	19	10	30	50
Fuji	11	10	42	45
Braeburn	5	5	59	67
Sundowner	0	5	na	65
Total	**100**	**100**		

EGVV --- Elgin, Grabouw, Vyeboom and Villiersdorp
na --- not applicable

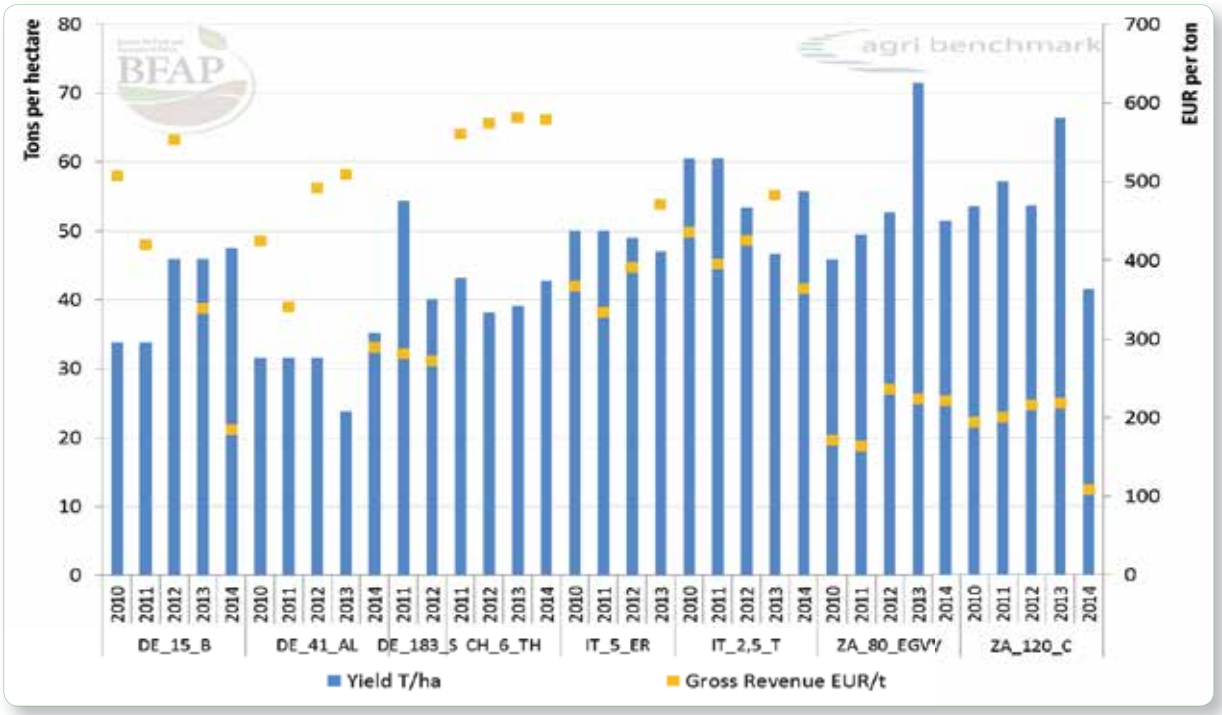


Figure 106: *Yield (ton/ha) and gross revenue (€ per ton) for apples (2010-2014) on various prototype farms in Germany (DE), Switzerland (CH), Italy (IT) and South Africa (ZA)*
Source: agri benchmark, 2016

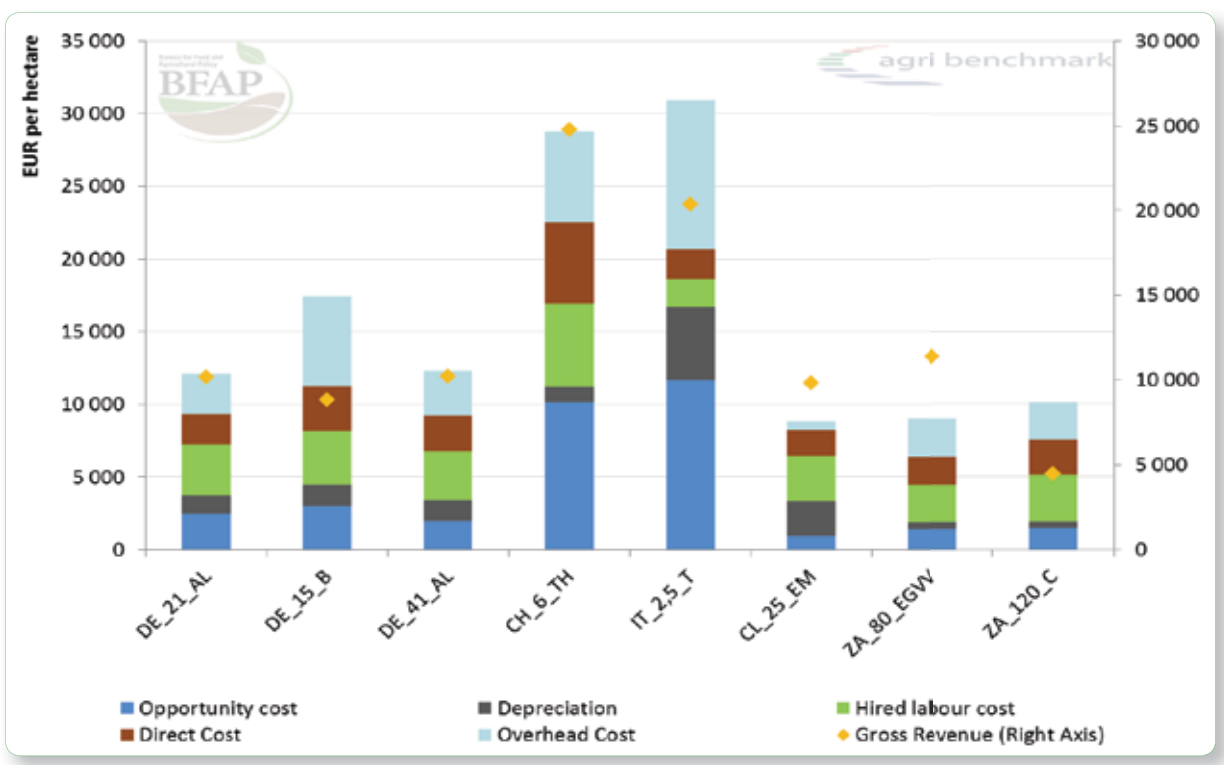


Figure 107: *Total cost(€ per ha) and gross revenue (€ per ha) for apples (2014) on various prototype farms in respectively; Germany (DE) Switzerland (CH), Italy (IT), Chile (CL) and South Africa (ZA)*
Source: agri benchmark, 2016

International competitiveness of the South African Stone fruit industry

Whilst the agri benchmark initiative provides some insight into the competitiveness of pome fruit production in South Africa, stone fruit is not presently included. Alternative research focused on the competitiveness of the South African stone fruit industry employed a comprehensive five-step analytical framework (Boonzaaier, 2015).

The competitiveness performance of the South African stone fruit industry was calculated using the two respective datasets of the FAO (2016) and ITC (2016) depicted in Figure 108. The ITC data is more comprehensive, as the FAO data includes only agricultural commodities as opposed to all traded products, but availability of the ITC data is limited to the period from 2001 to 2015, hence the FAO data provides a longer-term perspective, while the ITC data provides a more comprehensive short term view. Differences between the results from the two sets are indicative of the relatively more intense competition between agricultural products, as these products compete for a common set of resources that are less mobile. By implication, the major competing internationally traded alternatives are found within the direct agricultural production alternatives to stone fruit, such as other deciduous fruit – apples, pears and grapes, citrus, exotic fruits and vegetable groups.

Within the stone fruit aggregate, plums are the *de facto* leader, as illustrated by the disaggregated RTA measurements presented in Figure 109. Despite fluctuations, the trend is firmly upwards, particularly in the past decade. The competitive performance of peaches and nectarines' increased but remains at a marginal level, whilst apricots are experiencing a relative decrease in the performance levels, due in large to the shortage of lucrative and more profitable cultivars adapted to South African conditions. In an effort to improve this, trial-orchards are researched widely across the major apricot production areas.

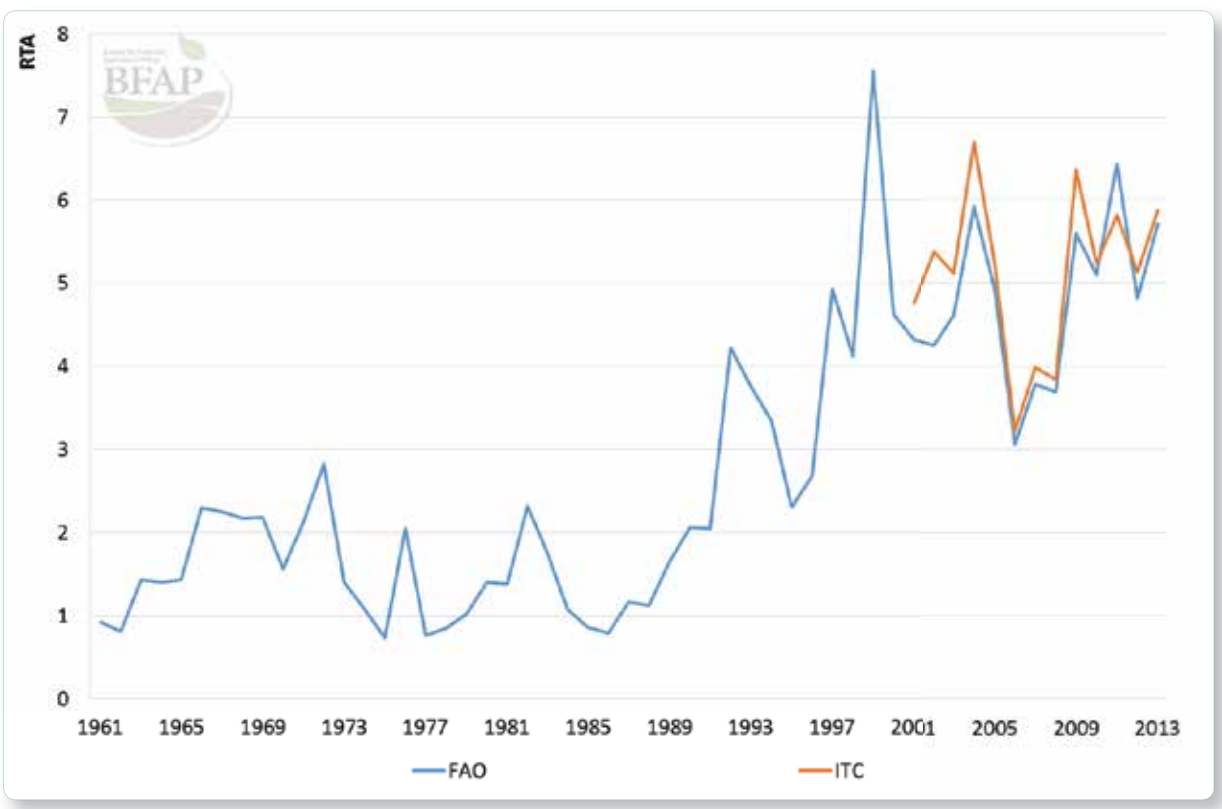


Figure 108: *Relative Trade Advantage (RTA) of the South African Stone fruit industry*

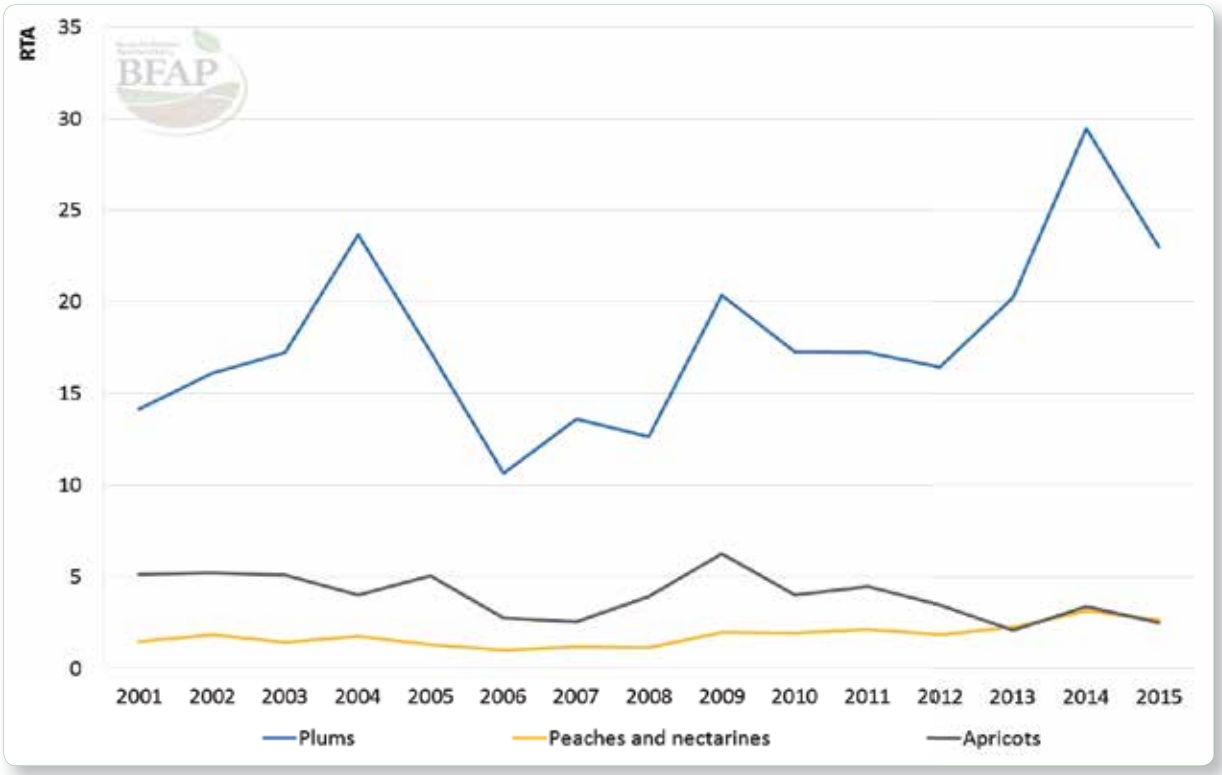


Figure 109: *Competitiveness of South African Stone fruit types measured by RTA*
Source: Calculated from ITC data

Factors impacting on competitive performance

In order to consider possible differences in views, 84 factors were grouped into 6 determinants affecting competitiveness between the functional role players in the value chain. Representative groupings or opinion clusters were identified and are presented in Figure 110. The business strategy, structure and rivalry determinant was found to make the greatest contribution to the competitive performance of the industry, whilst the other five presents opportunities for improvement.

Differences in the views of role players were again considered through a cluster analysis, dealing with input suppliers, or the agribusiness-orientated cluster (cluster 1) and a producer orientated cluster (cluster 2). General industry refers to the combined (entire) stone fruit responses irrespective of the functional value chain position claimed.

As different cluster groupings based on functional value chain positions were analysed, it became clear that there were significant differences between the respondents involved in the primary production and packing of stone fruit and the respondents involved in activities lower down the value chain, such as in pack houses/processors and exporters/marketers. Further down the value chain (processing, trading), the respondents (relating to Cluster 1) expressed more "bullish" or optimistic views and positive statements on competitiveness than those directly exposed to primary production (relating to Cluster 2) risks and uncertainties. This confirms the importance to ensure alignment regarding competitive performance to all related functions in the value chain, such as the expansion of competitive analysis to cover different points in the value chain in order to create better strategic alignment.

The above results were interrogated through industry wide work sessions and focus group discussions, after which eleven major industry level strategies were agreed upon. The major strategic improvements to enhance competitive performance argued for focus on improved industry-based lobby discussions, i.e. to build and strengthen the necessary communication between industry role players and government agencies through an improved strategic intelligence database, centred on aspects such as trade agreements, international market development and policy development. These priority actions accentuate the scope of the FIVCRT.

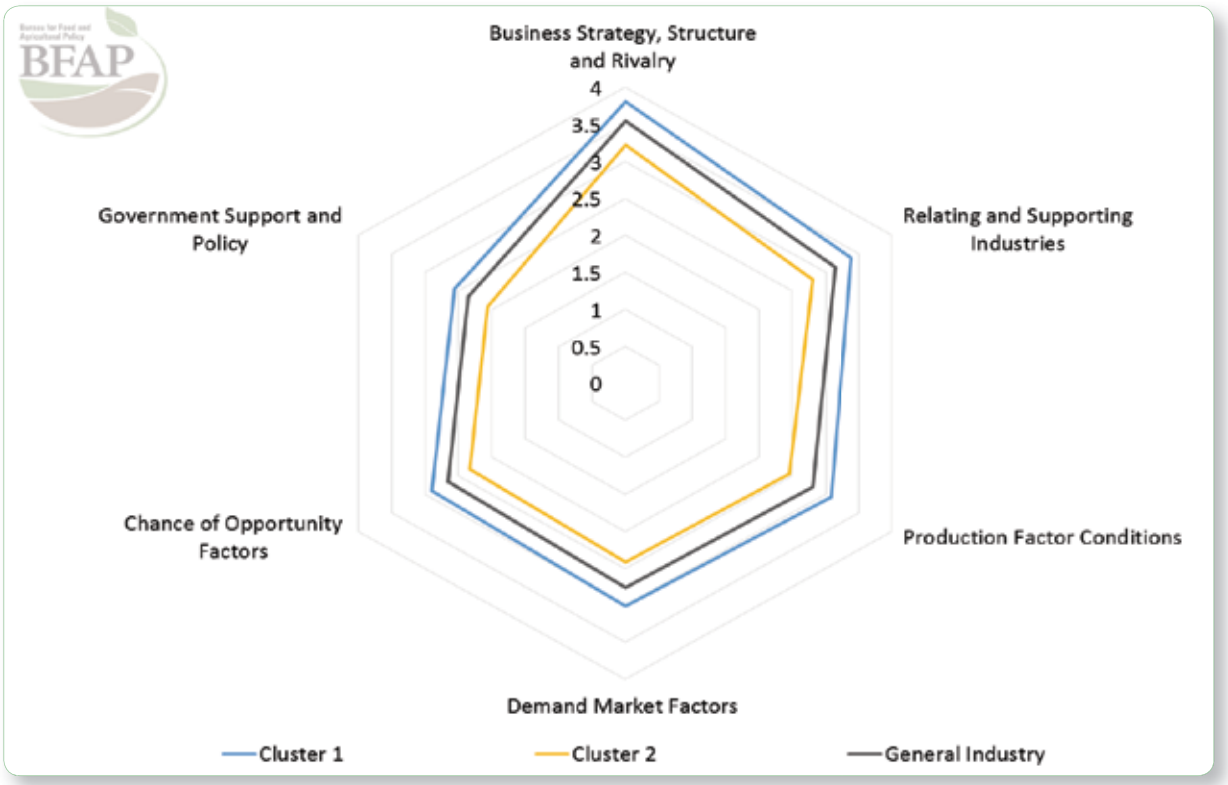


Figure 110: *Porter determinant of competitiveness: Comparing clusters*

SOUTH AFRICAN OUTLOOK

Outlook for horticultural products

WINE GRAPES AND WINE

The South African wine industry encompasses some 100 thousand hectares of vineyards, farmed by 3300 producers and 30 thousand farm workers, with wine in 560 cellars, and with 52 BBBEE projects running. Of the roughly 425 million litres exported, 60% is in bulk, with the EU and UK responsible for 75%. Exports to USA, Africa and China are below 10% each, but growing.

Wine grapes and wine

Introduction

The South African wine industry encompasses some 100 thousand hectares of vineyards, farmed by 3300 producers and 30 thousand farm workers, with wine in 560 cellars, and with 52 BBBEE projects running. Of the roughly 425 million litres exported, 60% is in bulk, with the EU and UK responsible for 75%. Exports to USA, Africa and China are below 10% each, but growing.

The South African Wine industry formulated the Wine Industry Strategic Exercise (WISE) as its strategic guideline towards 2025:

"A revised strategic framework with aspirational targets needed to ensure an adaptable, robust, globally competitive and profitable SA wine industry"

WISE is geared towards changing the wine and brandy landscape to strategically direct this industry on a route with a more sustainable future, while increasing its adaptability and robustness with enhanced competitive performance. The WISE is in the process of aligning its efforts and objectives in order to feed into the Wine Industry Value Chain Round Table (WIVCRT).

WISE deliverables include formalisation of the global trade agenda, technological innovation, promotion of Brand SA, taking tourism forward, and establishing a transformation plan for the industry.

Table 15 presents the ideal future state of the wine industry, as envisioned by the WISE and Wine Industry Value Chain Round Table, which addresses the realities faced by the industry and its stakeholders. The immediate priorities identified include exports to China, USA and Africa, tourism, the exploitation of the local market, transformation, and the dissemination of the fruits of research and development throughout the industry.

Value creation remains critical for success in the market place, but from a producer's perspective, the majority are facing an ever-increasing price-cost squeeze which hinders investment capabilities. Table 16 explores the segmentation of value chain stakeholders highlighting the need for collaboration to ensure sustainability in the context of economic and financial returns on risk invested.

Table 15: *WISE 2015 Realities vs 2025 Ideal future state*

2015 Reality	Ideal future state 2025
• Producer ROI = 2%	• Producer ROI: CPI + 5%
• Production driven – 80 000 ton surplus	• Market and value chain driven
• Black owned land & water – 2.5%	• Black owned land & water – 20%
• Local wine consumption 325 million litres	• Local wine consumption 425 million litres
• Bulk: Packaged export – 60:40	• Bulk: Packaged export – 40:60
• Ethical Accredited Volume – 20%	• Ethical Accredited Volume – 100%
• 25% volume handled via traders	• <10% volume handled via traders
• Only 2 Free Trade Agreements	• Key markets, Lead Africa
• Markets: USA: China: Africa (1%: 2%: 5%)	• Markets: USA: China: Africa (7%: 7%: 10%)
• Wine Tourism R6 billion	• Wine Tourism R15 billion
• Industry levies R80 million: Gov R11 million	• Matched funding
• Job Creation – 275 000	• Job Creation – 375 000

Table 16: *Shelf price value chain breakdown of 750 ml bottle at shelf price of R29.99*

Bottling & packaging	Retail margin	Distribution & warehousing	Excise & VAT	Trading terms, sales and marketing cost, levies storage & interest	Wine manufacturing cost	Producer production cost	Netfarm income
R6.50	R3.75	R2.75	R5.71	R7.29	R1.29	R2.19	R0.52
22%	12%	9%	19%	25%	4%	7%	2%

Source: WISE (2016)

Policy shifts associated with the deregulation of agricultural markets in the 1990's and the subsequent liberalisation of trade transformed the South African wine industry within a relatively short time span. Similarly, the outlook will be shaped by the rate and extent to which the strategic objectives associated with WISE are achieved in the coming decade.

Wine Grape Production

There were 280 million vines in production (4 years and older) in 2015, down by 8.2% from the 307 million in 2014. Figure 111 presents the extent of the change in the proportions of red and white wine cultivars planted in South Africa. The share of red wine cultivars increased to 44% in 2015 from only 24% in 2000, whilst the share of white wine cultivars declined from 76% in 2000 to only 56% in 2015. The shift is mainly the result of producers responding to very rewarding red wine prices. The total number of red vines increased significantly from 49.03 million vines in 2000 to 126.1 million in 2007 with relatively constant, if less dramatic growth to 134.7 million vines in 2015.

Going forward, the total number of vines planted in South Africa is projected to decrease by an average of 0.9% per annum, reaching 262 million vines in 2025 with the proportion of white (mainly Chenin Blanc and Colombar) and red (mainly Shiraz, Cabernet Sauvignon and Pinotage) grape varieties converging to 55% and 45% of total vines respectively by the end of the outlook.

Evaluation of the current yielding vines planted suggests that vines aged between 8 and 15 years constitute 39% of the total in 2015, up from 37% in 2008 (Figure 112). This age group has consistently held the largest share of vines over the past 8 years. It is clear that the share of young vines (>3 years and 4-7 years old) has decreased over time, while the share of vines in age groups 16-20 and more than 20 years old increased. This trend of aging vines is expected to continue going forward due to the growing number of vines reaching their replacement age following the rapid plantings in the late 1990s and early 2000's. The number of yielding vines totalled 202.9 million in 2000 and increased by 45% to 294.4 million vines in 2011.

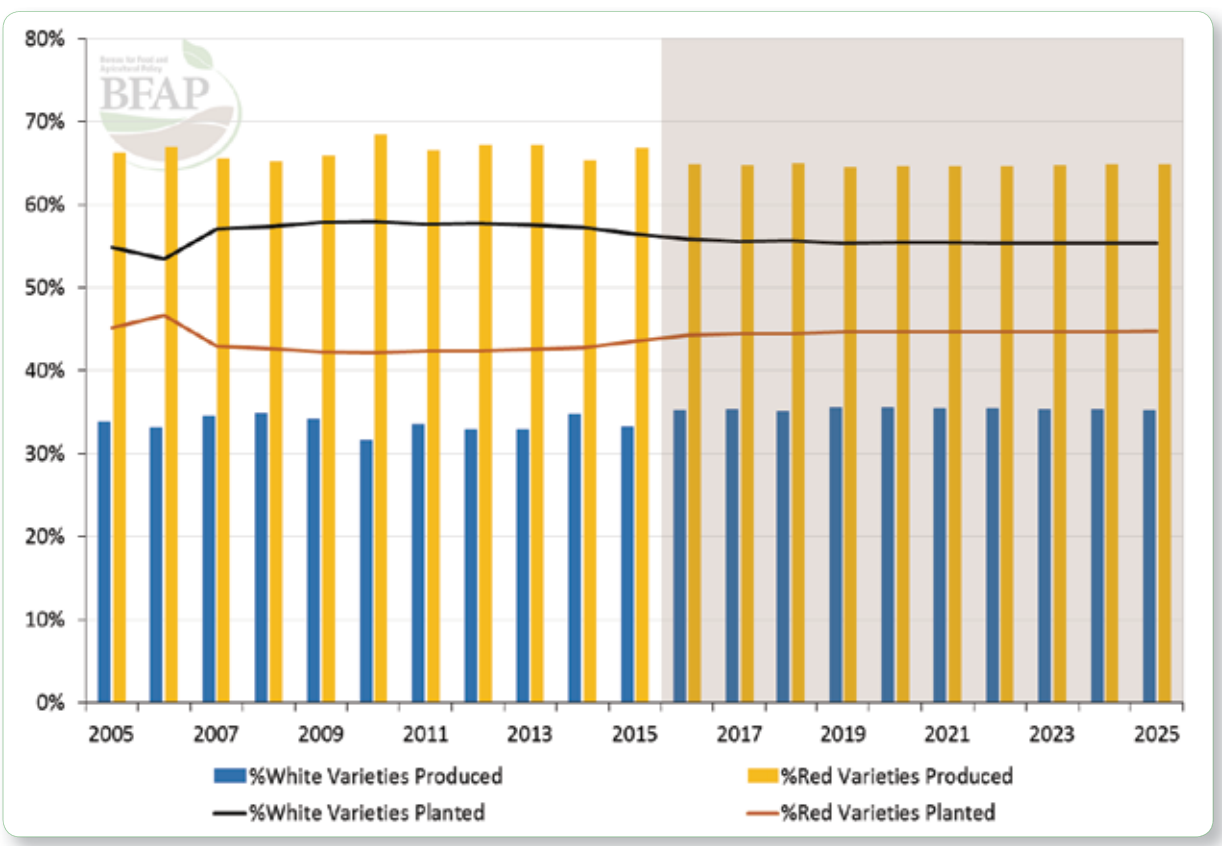


Figure 111: *Relationship between white and red wine cultivars in South Africa: 2005 - 2025*

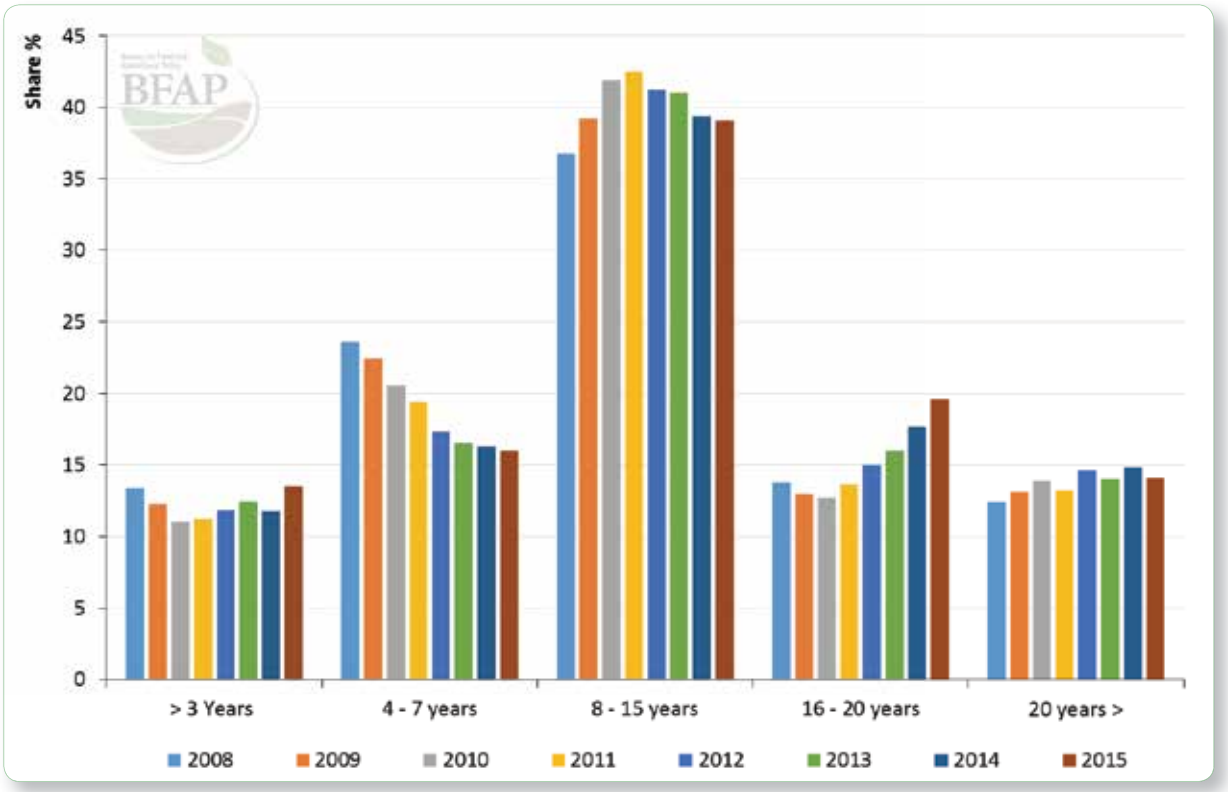


Figure 112: *Average age distribution of South African vines: 2008 – 2015*
Source: SAWIS (2016)

Given current profitability levels, non-niche vines are unlikely to be replaced; hence producers are faced with the decision of switching to alternative crops or trying to extend the life of bearing vines. This trend is most prevalent in the colder production areas given the shorter lifespan of their vines and lower production volumes. In the short term however, the impact of this trend should not be overestimated, given that the largest share of production takes place in the Breedekloof, Olifants River and Orange River regions, but this scenario could play out over the long term in the above-mentioned regions as well if current price trends continue.

International comparison of commercial wine grape farming in SA

As part of the agri benchmark initiative, two 50 hectare prototype wine grape farms have been identified in South Africa based on the standard operating procedure defined within the agribenchmark network to ensure comparable results. The two farms are situated in the Breedekloof and Paarl regions. The lifespan of the vineyards is assumed to be 25 years, with an average time to first full bearing of five years for the Breedekloof prototype farm and six years for the Paarl prototype farm. The vineyards of both prototype farms are under drip irrigation, with an assumed 3 333 vines per hectare. Grapes of the Breedekloof prototype farm are delivered to a local cellar, while the grapes of the Paarl prototype farm are delivered to private cellars and wholesalers.

Figure 113 indicates that South Africa is a cost effective producer, but fails to attain the same revenue as the German and Italian farms. The total cost of the German prototype farm is more than double that of the Italian and South African farms. No hired labour was used on the (relatively small) Italian prototype farms. The directly allocable costs of the two South African prototype farms were lower than in Germany and Italy; however if the labour cost component is added to the direct and indirect costs,the total cost of production (excluding opportunity costs) of the South African prototype farms is comparable with that of one of the Italian farms.

While costs are higher, the gross revenue attained on the German and the bigger Italian prototype wine grape farms were almost double that of the other prototype farms. In South Africa, comparison of the various grape varieties grown on the Paarl and Breedekloof prototype farms indicates that averages prices received by the Paarl farm exceed those of the Breedekloof farm

by R1230/ton. The Breedekloof farm however achieved average yields of almost 5 ton per hectares more than the Paarl farm in 2014. Thus while prices were significantly higher in Paarl, Figure 113 suggests that the gross revenue per hectare in the comparable years is slightly higher for the Breedekloof prototype farm, with yield gains more than offsetting lower prices.

Wine production

In 2015, drinking wine production increased by 1% to 968.4 million litres, while the production of wine for brandy, distilling wine and grape juice and grape concentrate decreased to 41, 112, and 30 million litres respectively (Figure 114). Keeping with the trend in wine grapes, total wine production is also projected to decline marginally over the outlook. Furthermore the share of drinking wine in the distribution of grape product production declines marginally over the outlook period.

Trade

Wine exports have expanded from 122 million litres in 2000 to 313 million litres in 2015 for destinations listed in Figure 12.5, while total exports increased from 151.6 million litres to 423.5 million litres over the same period. Despite the projected decline in wine production over the outlook, a significant share of total wine production will remain destined for the export market. South Africa exports wine to a number of important markets, including the United Kingdom (UK), Germany, the Netherlands and other EU member states, North America, some African countries (neighbours Zimbabwe and Mozambique, as well as Kenya, Nigeria and Angola), Russia and China (Figure 12.5). As the main export destinations, European and British demand will continue to drive wine exports over the outlook, vouched by the duty free quota which will increase from 46 million litres to EU markets on 1 October 2016 to 110 million litres (WIVCRT, 2016). The renewal of the African Growth and Opportunities Act (AGOA) presents growth opportunities in the USA, where export volumes have been increasing since 2000, while rising exports into the BRIC region are mainly driven by Russian demand. The impact of Brexit is as yet unknown, but given that the UK remains South Africa's biggest market, this aspect should be given serious attention by the state.

Going forward, the outlook for total exports remains broadly positive, given the continued value proposition of South African wines in Europe, the relative strength of the US Dollar and the possibility of continued export growth into the African and Russian markets. The share of exports in the total marketing mix is projected to increase over the outlook and by 2025, total exports are projected to increase by 13% from 2015 volumes. Within the context of a slight downward total wine production

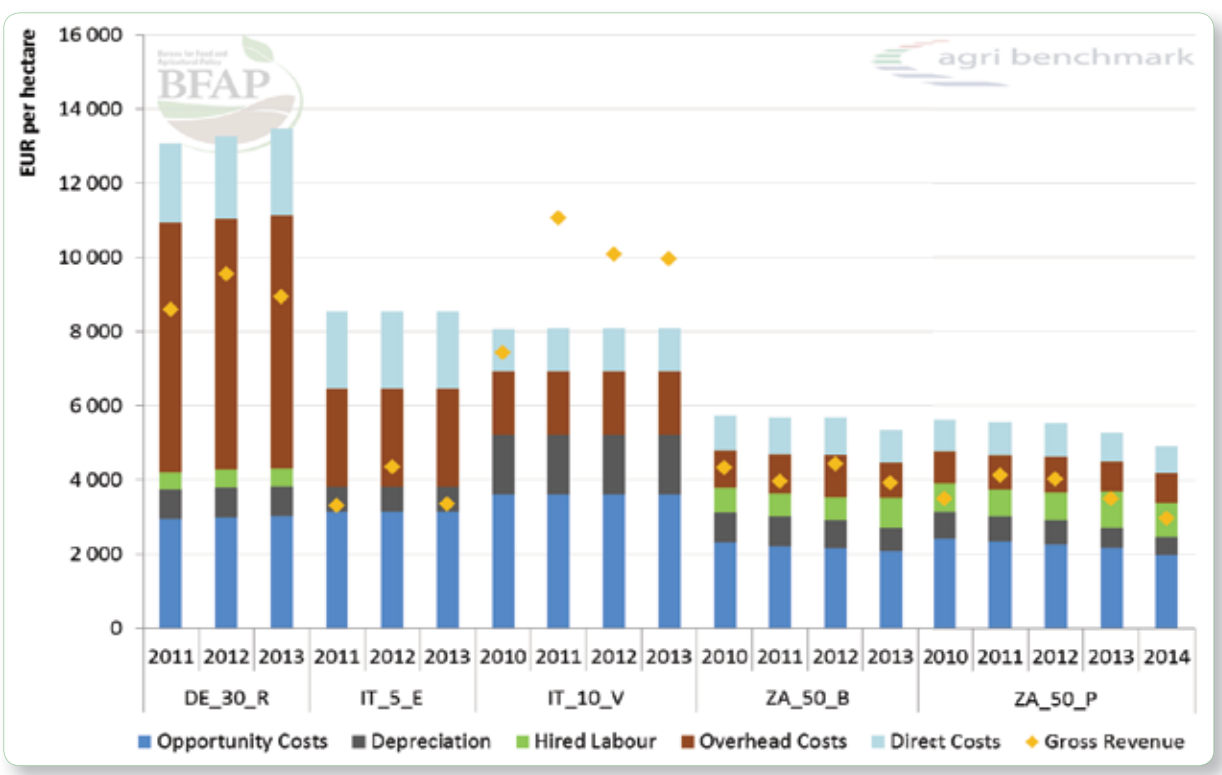


Figure 113: *Total cost and gross revenue for wine grapes on various prototype farms in Germany (DE), Italy (IT) and South Africa (ZA). Source: agribenchmark (2015)*

trend, the total export volume projected for 2025 remains below the record volumes exported in 2014. This outlook remains subject to a number of uncertainties, including the impact of the downturn in the oil market on exports to Russia and a number of prominent African oil producing countries such as Angola and Nigeria.

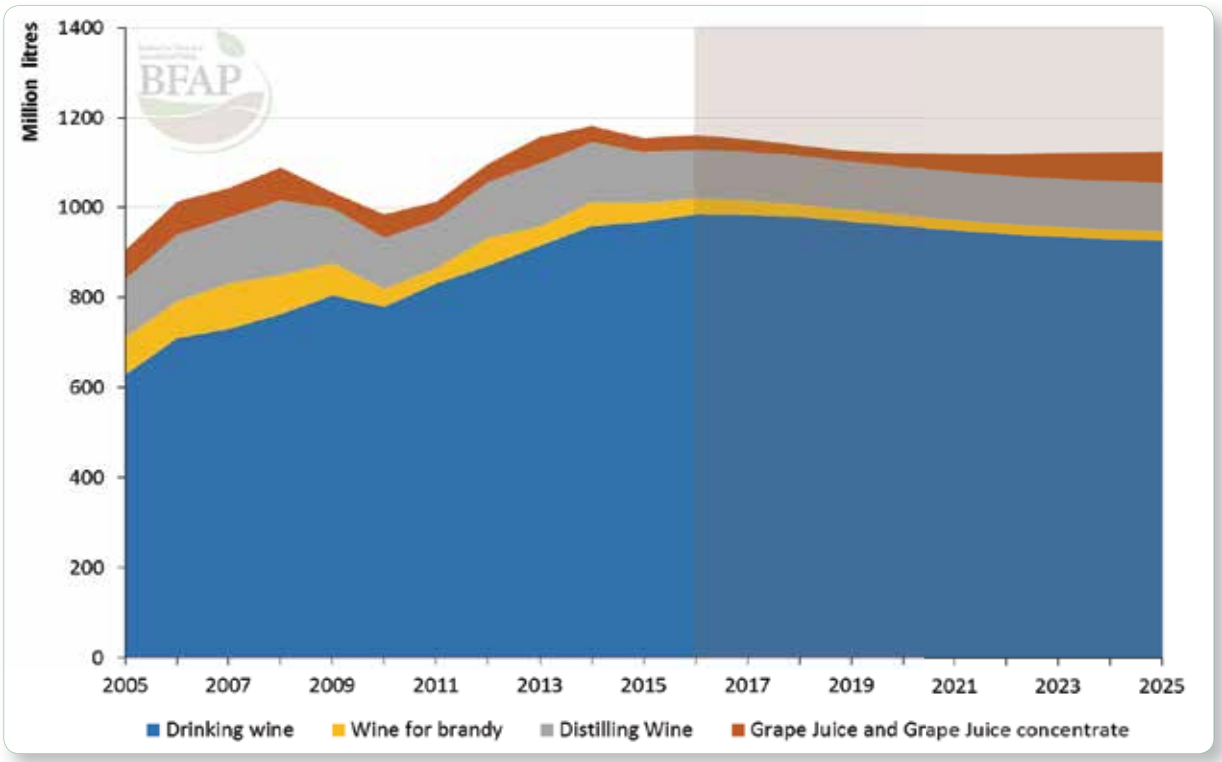


Figure 114: *Historical and projected production volume of grape products: 2005-2025*

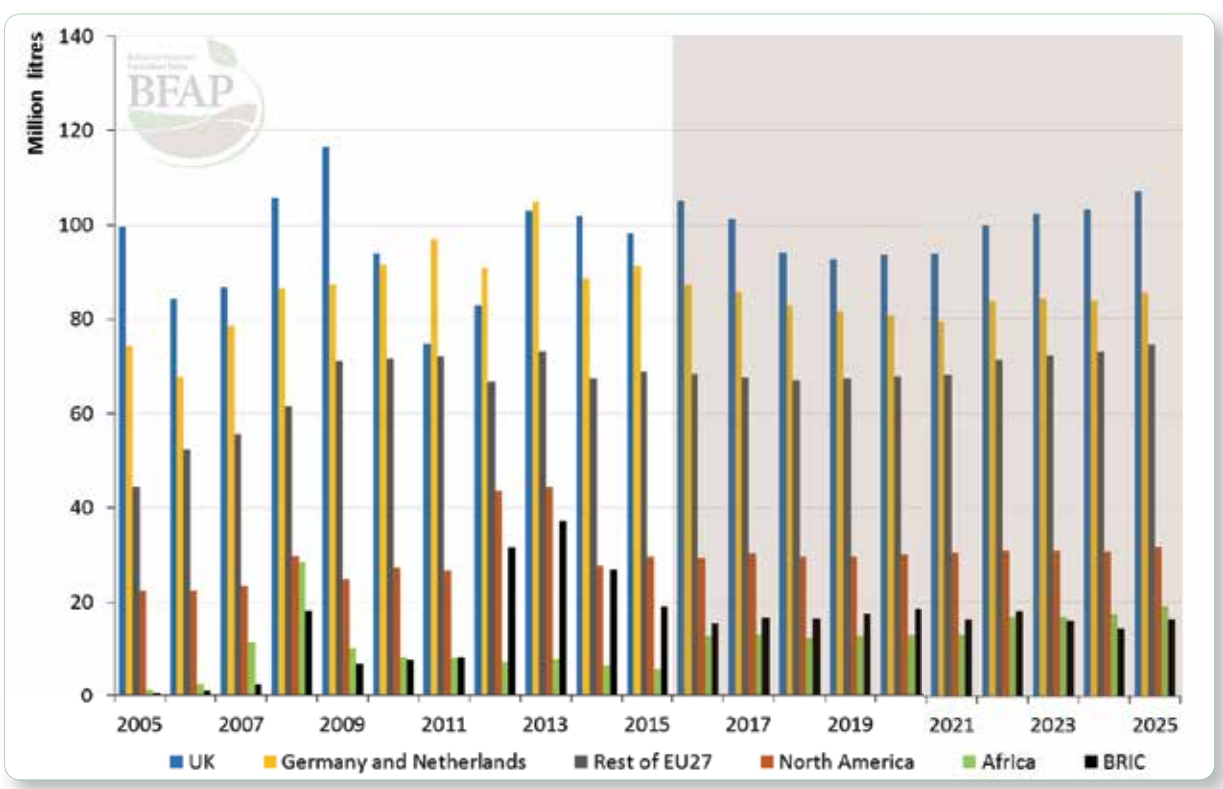


Figure 115: *Historic and projected export volumes by destination: 2005-2025*
Source: SAWIS & BFAP, 2016

Box 12.1: Impact of tariff removals on wine exports

Exports are important for the South African wine industry; however, tariffs can restrict market access. As a result, it is important to measure the impact of tariff reductions that could be negotiated through free trade agreements. Because of their importance as new destinations for South African wine, an evaluation of the impact of the elimination of tariffs with Angola, Kenya (tripartite trade agreement between SACU, SADC and COMESA), the USA (AGOA) and with China (BRICS) was conducted using the recently restructured BFAP wine model. The baseline is based on the assumption that the current tariff structure remains in place, whilst the scenario is based on the complete removal of tariffs to the markets indicated. Results are conservative, as negotiation of such agreements typically also involves the reduction of non-tariff barriers, but these are not included in the results due to the difficulty in quantifying their impacts. The tariffs currently applicable to South African exports in the listed markets are presented in Table 17.

Table 17: *Wine tariffs in selected countries*

Country	Wine Bottles	Wine Bulk
Angola	30%	30%
Kenya	-	25%
Nigeria	20%	-
China	14%	20%
USA	0.73%	-

Source: ITC – Trademap (2016)

Basic exploratory analysis suggests that South Africa's main competitors in terms of wine exports in the listed markets include France, Spain, Portugal and the USA in Angola and Kenya; Spain, Chile, Portugal, Germany, the USA and the Ukraine in China; Portugal, Chile, France and Argentina in the USA.

Combining the total effect of possible trade agreements in Africa, China and the USA, the tariffs listed in Table 17 are removed

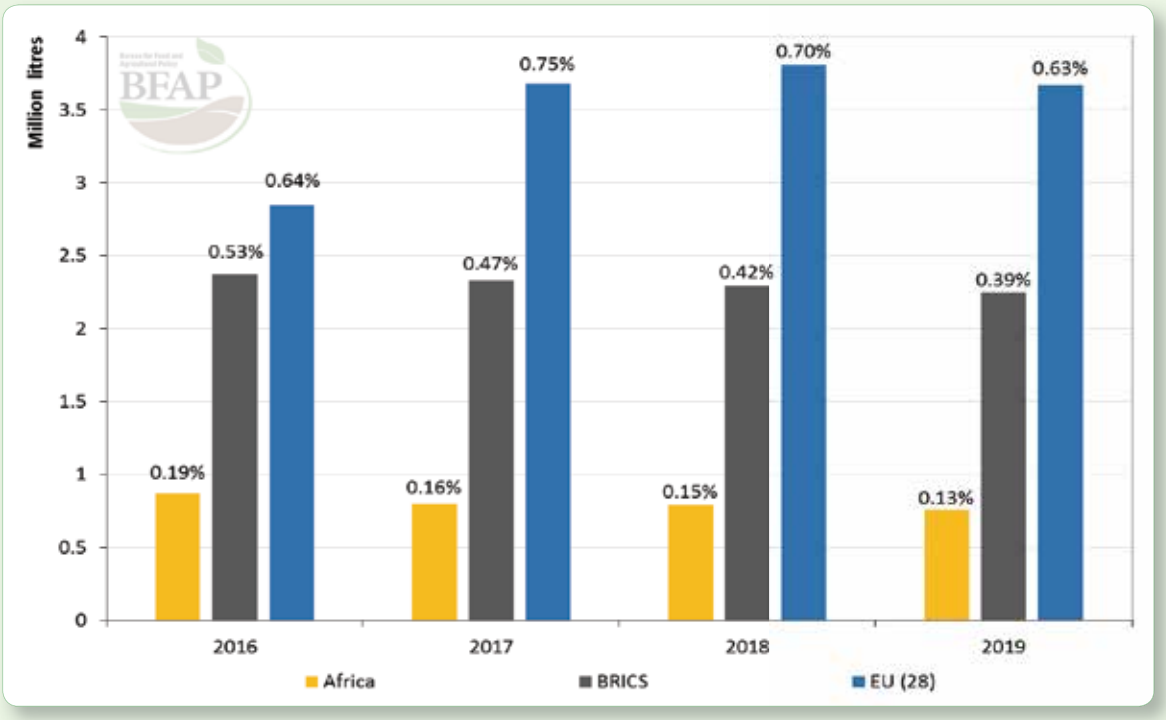


Figure 116: *Change in exports resulting from tariff removal in selected countries*

simultaneously: the effect is shown in Figure 116. In 2016 total exports increase by 1.05 million litres (0.23% of South Africa's expected total exports) and by 2024 total exports have increased by 890 thousand litres from the baseline levels (0.17%). Over the next 9 years (2016 – 2024) total wine exports would increase by a total of 8.5 million litres as a result of the tariff removals in the countries illustrated. This increase amounts to just under 2% of any given year's total wine exports.

These impacts are small: even though tariff removal induces significant export growth in these markets, Africa, China and the US respectively only comprise 3%, 1% and 1.5% of the current total South African export market. Furthermore, tariff levels into the US are less than 1% at present due to preferential market access under the African Growth and Opportunities Act (AGOA), and for other markets such as Angola and Kenya, non-tariff barriers pose further challenges to market access. Further work on a larger sample of African countries, and on the impact of removing non-tariff barriers would be required to illustrate the full impact.

Domestic consumption and price trends

Domestic per capita wine consumption was estimated at 7.3 litres per capita in 2015 and is projected to decrease by 6% to 6.9 litres per capita by 2025. The decline in per capita consumption is expected to offset population growth over the outlook with total consumption of wine in South Africa expected to increase marginally to 404 million litres by 2025, from 400 million litres in 2015. The decline in per capita consumption arises from weaker income growth, combined with the assumption of continued increases in excise duties, which offset the decline in prices.

The premium for red wine during the late 90's and early 2000's led producers to invest by establishing red vines which in turn led to significant red wine price decreases as production volumes increased substantially (Figure 117). Real prices are expected to remain at low levels and while the red wine price continues to decline due to relatively high stock levels, others remain more or less constant over the outlook period. The real prices of white and red wine decreased from 2014 by 3% and 5% respectively in 2015. The real price of wine for brandy increased by 4%, but is also projected to decrease slightly over the outlook.

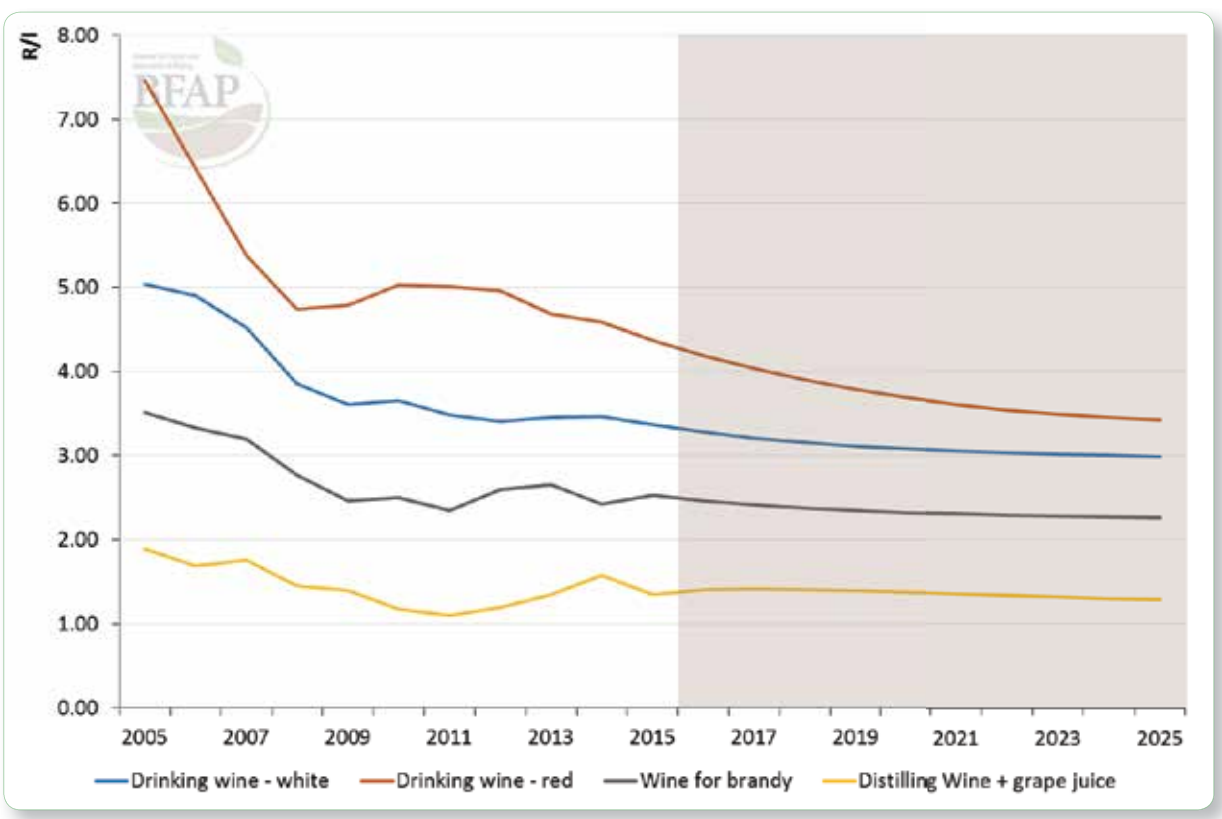


Figure 117: *Historic and projected real (2000) wine prices: 2005-2025*

MILK, BREAD AND MONEY -

FOOD INFLATION DYNAMICS AND NUTRITIONAL IMPLICATION FOR CONSUMERS IN SOUTH AFRICA

Food price dynamics, but more specifically food inflation, has broad implications affecting aspects of the macro-economy and households. On a macroeconomic level, food inflation is often identified as the culprit for the underlying inflationary pressures present in the economy. With regards to households, food inflation directly speaks to food security issues in the form of access to food or food affordability, and ultimately, how price dynamics potentially affect household nutrition

The importance of food inflation

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This chapter therefore starts off with an overview and outlook of aggregate food inflation in South Africa, before exploring the implications of the drought on the affordability of healthy eating, with a more detailed focus on staple foods.

The history of food inflation in South Africa

Rapid food inflation has been a recurring issue in South Africa for little more than a decade. Just after the turn of the millennium, year on year food price inflation reached 20%, in the last quarter of 2002. This rapid growth in food prices was mainly driven by a significant depreciation in emerging market exchange rates, especially the Rand and a sharp increase in international commodity prices. Local prices stabilised in 2003 when the Rand regained its strength and appreciated by approximately 30%. International commodity prices traded sideways, only to regain momentum from 2005 to 2008. The latter increase was again due to increases in international commodity prices, only this time the increase was much more severe. There is now a general consensus that the above mentioned price increases, from 2005 to 2008, can be attributed to a metaphorical "perfect storm", where factors such as increased bio-fuel production, droughts in key grain producing regions and rapid growth in developing countries such as China and India, all contributed to push commodity prices to unprecedented levels. Commodity prices, and as a result food prices, decreased in 2009 and 2010, but it did not return to the pre-2005 level, pointing to a structural change in commodity markets. This change was underpinned by the introduction of bio-fuel production, which essentially added a further demand for 100 million tons of grains and oilseeds to the international market. In 2011, local food inflation again approached double digits, with year on year inflation in July reaching 8.9%. This increase was yet again

Figure 118: *Aggregate Inflation vs Food Inflation in South Africa*
Source: Stats SA, 2016

driven by higher international commodity prices, but also by a steep increase in administered local prices, such as electricity, which increased cost throughout the value chain. During the first six months of 2012, food inflation decreased with moderate spikes in the inflation rate during the second half of 2012 and 2014. Later in 2014, there was a rapid increase in food inflation which coincided with substantial increases in administered prices of inputs such as electricity and labour. Towards the end of 2014, inflation decreased on the back of significantly lower oil prices. This was however totally eradicated with rapid food price increases seen since mid-2015. Initially this was driven by a modest recovery in global oil prices but towards the end of 2015, the full effect of the severe drought and a significantly depreciated exchange rate became apparent. These inflationary movements (food and aggregate) are depicted graphically Figure 118. It provides intuitive support for the expectation that food prices may be a key driver of inflationary pressures in South Africa.

An 18 month food inflation outlook

In order to generate an outlook, the underlying statistical properties of historical monthly food inflation rates for the period[2] January 2003 to March 2016 were analysed to determine how this series responded to demand and supply shocks in the past. This information was then used to generate a projection of what could be expected with regards to food inflation over the next year Figure 119.

Figure 119 indicates that, based on historical dynamics associated with food inflation in South Africa, an acceleration of food inflation can be expected up until October 2016, reaching a peak of 13.7%. Thereafter, food inflation could decrease steadily to a rate of around 8.8% in September 2017. This results in an estimated average inflation for the first three quarters of 2017 of 10.75%. This projection does, however come with some caveats. It is based solely on the statistical properties of historical food inflation since 2003 and is therefore not supported by economic theory or arguments. In terms of inflation forecasting this method of generating an outlook is however well accepted since inflation rates are expected to have some form of inertia or momentum. Furthermore, for the period under consideration (2003-2016), there has not been a supply shock that is comparable to the drought of the 2015/2016 planting season combined with the rapid depreciation of the exchange rate. As a result the above projections might prove to be somewhat conservative (in terms of magnitude and persistence), since previous shocks that resulted in inflationary episodes were associated with strong demand or supply issues where the shocks were less severe. Currently the Rand provides the greatest risk to the inflation outlook. Further depreciation could support increases in distribution and manufacturing costs for food. In addition, a weak exchange rate will support commodity and product prices by increasing the cost of imported products, or alternatively by allowing for attractive export opportunities such as those evident in the red meat sector. This could prolong the inflationary period that is currently being experienced, but at the same time white maize prices are projected to decline by approximately 35% over the next 12 months under the baseline assumptions of normalised weather. This will reduce the inflationary pressure, especially on basic food staples.

Evaluation of the drought impact on price dynamics of the BFAP balanced food baskets

As the new production season in the summer rainfall areas approaches, the focus, in terms of agricultural production, has shifted away from the physical impacts of the drought towards strategies on how producers' debt and cash flow positions can be structured to mitigate the lingering effects of the drought. However, consumers - especially lower income consumers - are now increasingly feeling the pinch. The dominant food items within the food expenditure of lower income consumers are chicken, maize meal, brown bread, white bread, rice, beef, sugar and edible oils (accounting for about 50% of total food expenditure). Figure 120 illustrates the food price inflation movements on these foods from April 2015 to April 2016, indicating significant price increases for frozen chicken portions, maize meal, sunflower oil, white sugar, beef chuck, brown bread and white bread.

Over the last few years BFAP has developed a range of 'balanced food basket' options for low-income consumers in South Africa. This was done to facilitate the measurement of food affordability from an 'ideal' balanced diet perspective. It should be noted that these BFAP balanced food baskets are not necessarily a reflection of how consumers eat, but rather an indication of what it will cost to follow a basic healthy eating plan. These baskets take into consideration the nutritional serving recommendations of the Department of Health which include all the food groups: Staple foods, animal protein foods, dairy, fats / oils, fruit, vegetables and legumes. These nutritional recommendations include the recommended number of

[2] The method of calculating the CPI changed in 2008. In order to have access to a longer time series CPI data from 2002 to 2008 and data from 2008 to 2016 were combined by converting the older data set to correspond with the base period used currently. It is however important to note the methodological change.

Figure 119: *Historic food inflation (Jan 2003-March 2016) and food inflation outlook April 2016-Sept 2017*

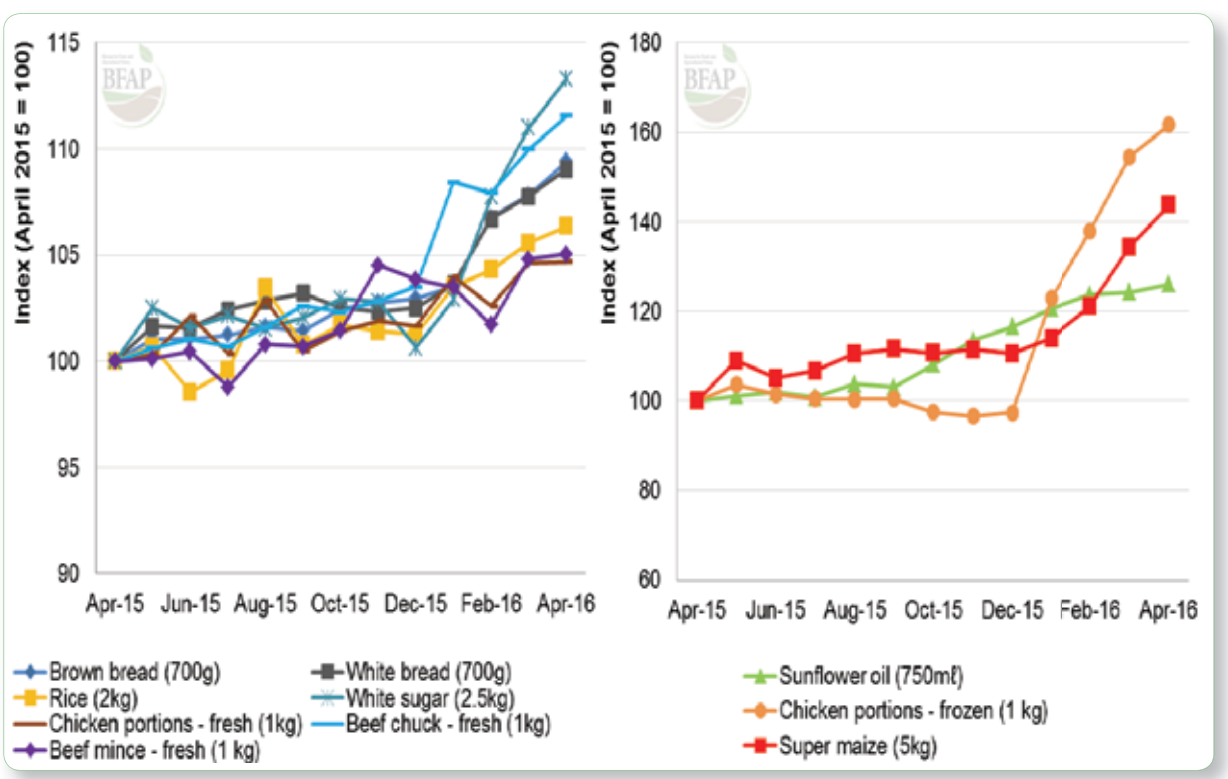

Figure 120: *Food price inflation on selected dominant food items within the food basket of poorer consumers in South Africa, comparing April 2015 with April 2016.*

food guide units within the various food groups, for different individuals in terms of gender and age. Typical food purchasing patterns of lower income consumers, extracted from StatsSA Income and Expenditure Survey (IES) 2010/11, were combined with the DoH recommendations to compile two healthy food baskets measuring the affordability of basic healthy eating. The first, dubbed the 'thrifty basket' has proportionally more staple food units, while the second basket has more dietary diversity. The costs of these food baskets are calculated by applying the official monthly food prices monitored by Statistics South Africa, as well as retail prices projected through the BFAP modelling system and transmission analysis (Figure 121). From April 2014 to April 2015, the inflation measured by the BFAP balanced food baskets (+23.8% for the thrifty basket and +25.8% for the more diverse basket) were significantly higher than CPI for food and non-alcoholic beverages (+12.3%) and the general CPI inflation (+6.5%).

Considering the StatsSA urban retail prices for April 2016, the cost of the thrifty BFAP balanced food basket was R3 503 per month and R4 616 per month for the more diverse basket. StatsSA IES 2010/11 indicates that poor consumers spend about 35% of total expenditure on food. In order to be able to afford the thrifty basket in April 2016 a household required a monthly income of about R9 400 - implying that only consumers within LSM (Living Standard Measures) segments 6 to 7 and upwards could afford such a basket (considering average household income levels according to AMPS 2015 AB). This level of income excludes the poorest 40% to 50% of the population. For the more diverse basket an estimated monthly household income of about R12 400 could be required if 35% of total expenditure is allocated to food. This level of income excludes the poorest 60% of the population, as only consumers from LSM segment 7 and higher could afford this basket.

Relating the drought to general food inflation is a complex process, since each product or product grouping is affected differently, due to various factors such as location of production area(s), resilience to drought, stock levels, supply response lag, etc. Considering household-level expenditure data from StatsSA IES 2010/11, the expenditure of the poorest 50% of the population is dominated by staple foods (i.e. bread, cereals, potatoes) with a 35% contribution and animal protein foods (meat, fish and eggs) with a 24% contribution (Figure 122). Meat is a high value product, so its importance is based on value. By contrast, bread and cereals play a significant role as the staple food of most South African households and their prominence is driven by the quantity consumed. If Figure 122 was expressed in absolute quantities the

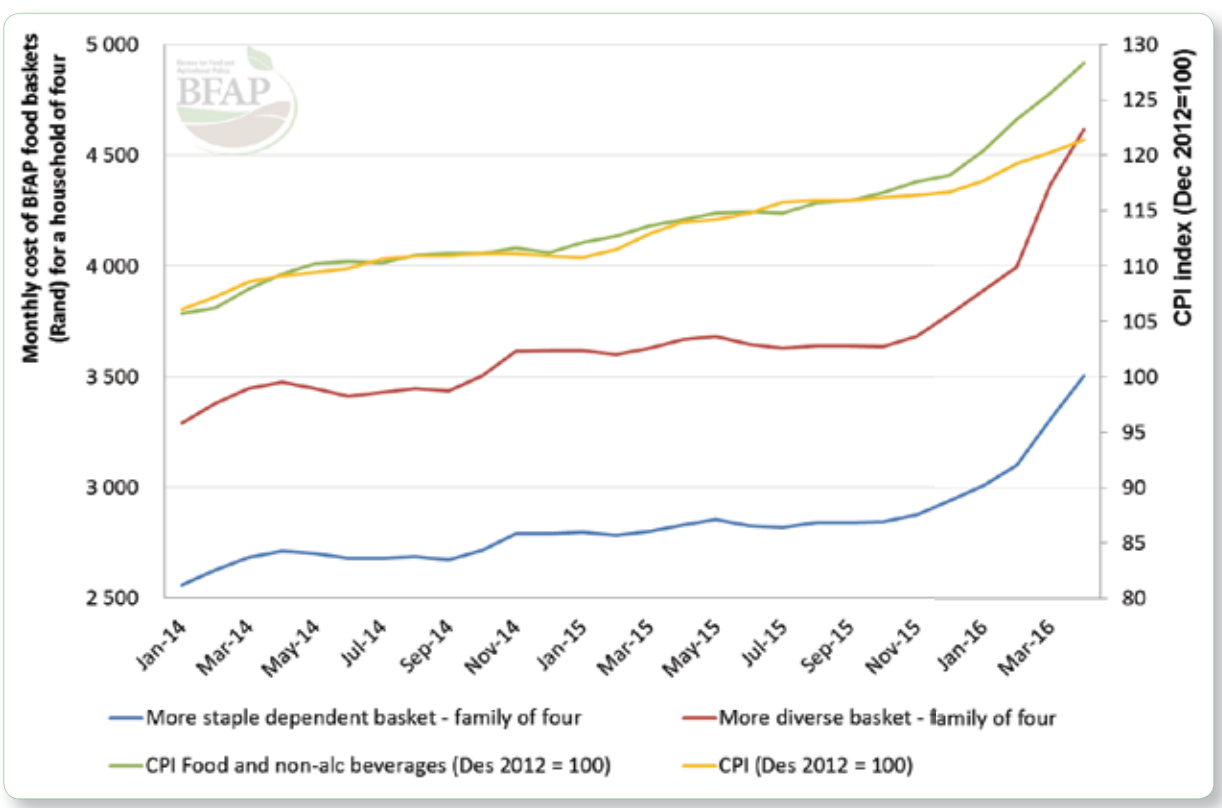

Figure 121: *A comparison of the CPI, CPI for food and non-alcoholic beverages and the BFAP balanced food baskets for the period January 2014 to April 2016*

dominance of staple items would be significantly greater. Based on the strategic importance of staples such as bread and maize meal, the outlook is focussed on the cost of a basket of staple products.

Extracting the staple components from the BFAP balanced food baskets, Figure 123 illustrates the impact of the drought on staple food affordability towards 2017. It is important to bear in mind that the thrifty basket contains relatively more staple food guide units than the more diverse basket, as recommended by the Department of Health. For example, for an adult male the daily recommendation for starch foods is 15 food guide units for the

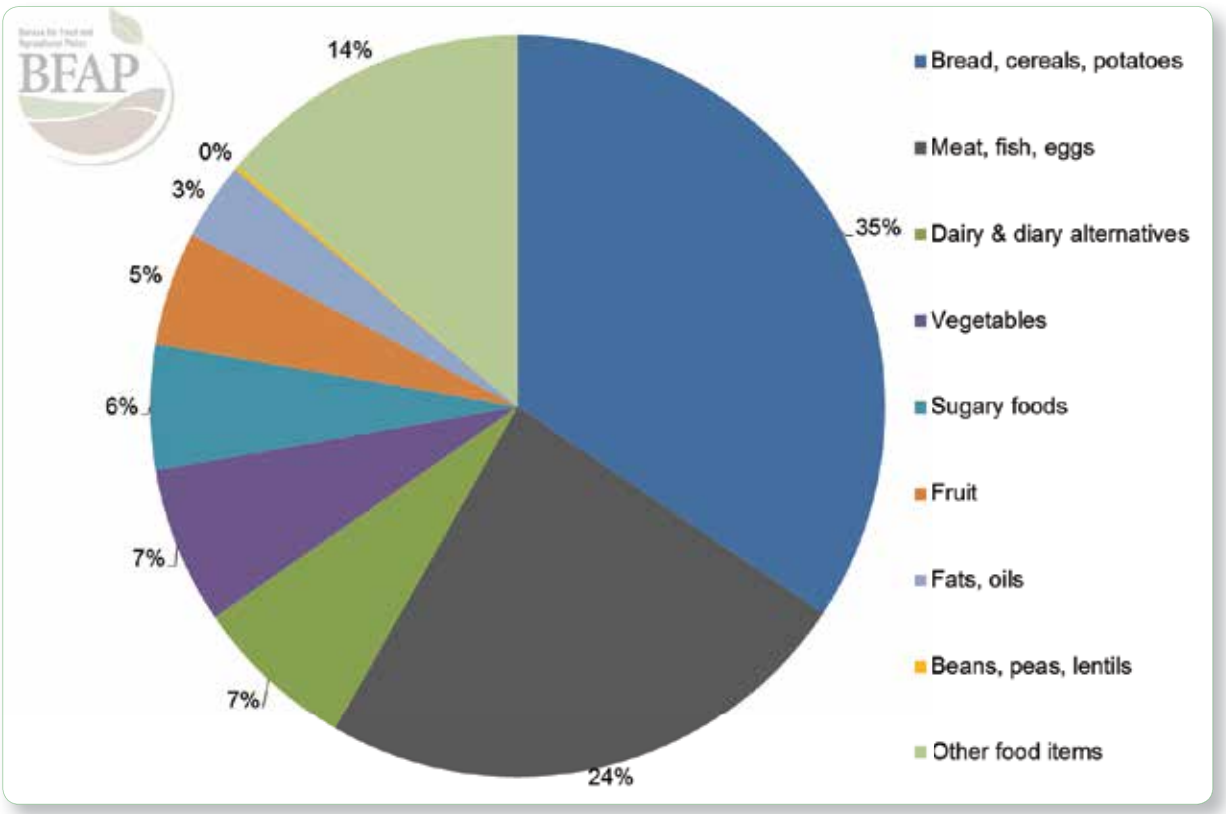

Figure 122: *The contribution of food groups to the household food expenditure of the poorest 50% of consumers in South Africa, estimated from StatsSA IES 2010/11 data*

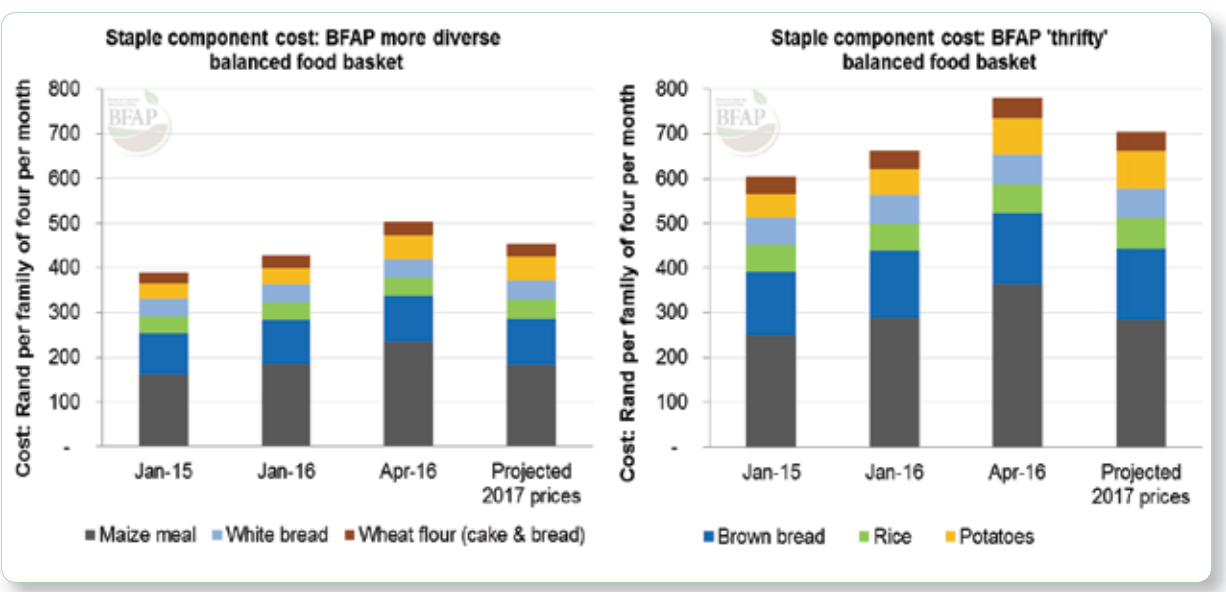

Figure 123: *Historical and projected staple component costs of the BFAP balanced food baskets for a family of four*

thrifty eating plan, compared to 10 units for the more diverse eating plan. From January 2015 to January 2016 the staple food component within the BFAP healthy baskets increased by R58 for the thrifty basket (to R663) and R38 for the more diverse basket (to R427). The first few months of 2016 up to April revealed significant further increases in the cost of the staple food component, increasing by a further R118 for the thrifty basket (to R780) and R76 for the more diverse basket (to R503). The price projections for 2017 developed through the BFAP modelling system indicates some recovery, with the staple component cost within the thrifty BFAP balanced food basket at R705 and R454 for the more diverse basket. The 'recovery' values projected for 2017 are similar to those observed for February 2016.

Within the thrifty BFAP balanced food basket the expenditure share of maize meal to total staple foods increased from 41.3% in January 2015 to 46.5% in April 2016 (and 40.4% projected for 2017) –illustrating the significant impact of the drought on maize meal affordability as the dominant staple food in the country. These expenditure increases are largely driven by higher retail prices and not by larger quantities consumed. In light of minimal income growth, poor households are most likely facing the reality of consuming less food and, given overall high food inflation, even less dietary diversity.

Box 13.1: Exploring food expenditure patterns and food affordability from a spatial provincial perspective

The impact of the drought differs across various regions in South Africa, prompting an analysis of the differences in the food expenditure patterns of poor consumers within the various provinces of South Africa. This analysis is based on the 2010/11 Income and Expenditure Survey of Statistics South Africa (StatsSA). 'Poor consumers' are defined here as the poorest 30% of the population in terms of the expenditure deciles as applied by StatsSA. Figure 124 presents an overview of the actual food baskets of poor consumers within the various provinces from an expenditure point of view, in terms of the various food groups. The dominant food groups (accounting for about 60% of expenditure in all provinces) are staples and animal protein foods, hence these groups are also explored in more detail. The provinces with the largest relative expenditure allocated to staple foods and other grain products are Limpopo, KwaZulu-Natal, Eastern Cape, Mpumalanga and Gauteng. The provinces with the largest relative expenditure allocated to animal protein foods are Northern Cape, Mpumalanga, Gauteng and Western Cape.

Figure 125 presents an overview of the staple food basket composition of poor consumers within the various provinces from an expenditure point of view. Key observations in terms of the provinces where particular staple foods are more important are:

- Maize meal: Free State, Limpopo, Mpumalanga and North-West provinces.
- Bread: Limpopo, Gauteng, Mpumalanga, Western-Cape and North-West.
- Rice: Eastern Cape, KwaZulu-Natal and the Western Cape.
- Potatoes: Northern Cape, Western Cape, Free State, Eastern Cape, KwaZulu-Natal
- Wheat flour: Northern Cape, Eastern Cape, Western Cape

Within the Northern Cape it is interesting that wheat flour has the largest staple food expenditure contribution (28%), followed by maize (18%) and white bread (14%).

Figure 126 presents an overview of the animal protein food basket composition of poor consumers within the various provinces from an expenditure point of view. Key observations in terms of the provinces where particular animal protein foods are more important are:

- Poultry (chicken) is the dominant animal protein food in all provinces.
- Beef is the second most important animal protein food from an expenditure perspective in North-West, Mpumalanga, Western Cape, Gauteng and KwaZulu-Natal.

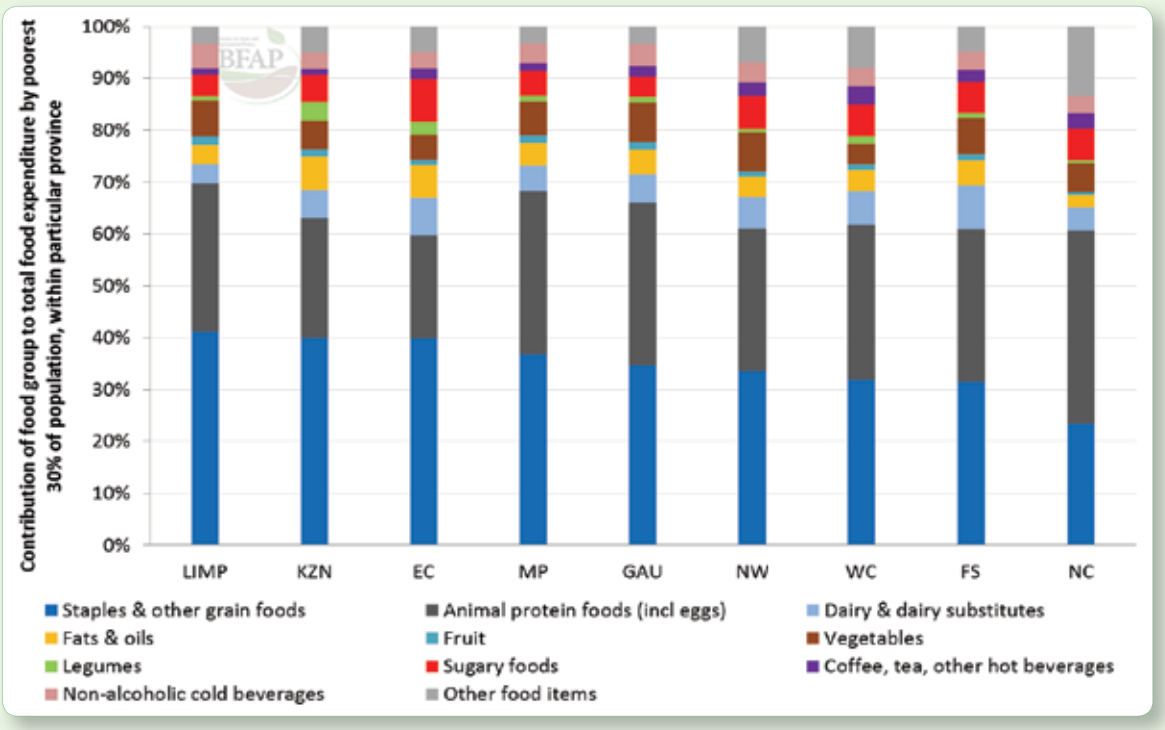

Figure 124: *Food baskets composition in terms of food groups, of poor consumers within the various provinces from an expenditure point of view*
Source: StatsSA IES, 2010/2011

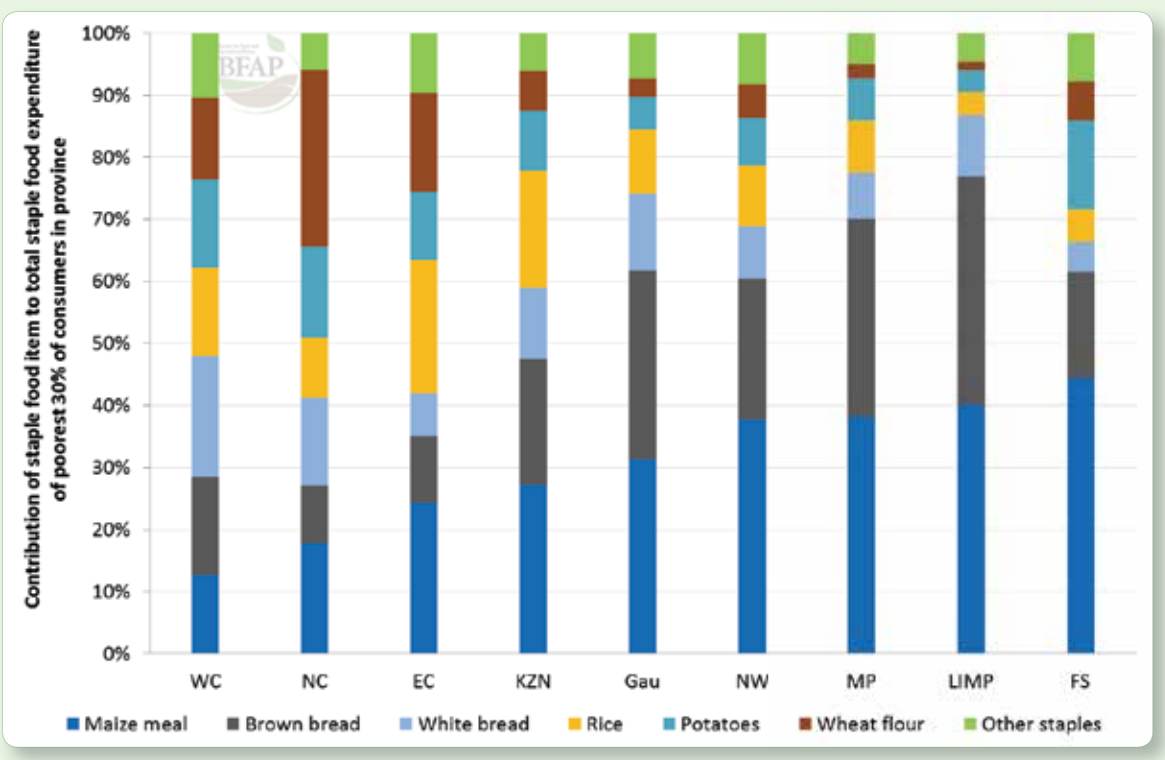

Figure 125: *Staple food baskets composition of poor consumers within the various provinces from an expenditure point of view*
Source: StatsSA IES, 2010/2011

- In Limpopo and Eastern Cape beef and eggs have similar contribution shares to total expenditure on animal protein foods.
- In the Northern Cape mutton/lamb has the second largest expenditure contribution (16%) following poultry (53%).

Within the BFAP Balanced Food Basket model food expenditure patterns are used as an indication of food preferences, in order to 'populate' the appropriate number of food guide units recommended by the Department of Health for various age and gender groups. Figure 127 illustrates the cost of the thrifty and more diverse BFAP Balanced Food Baskets for a family of four, considering three provinces as an example namely Gauteng, Western Cape and Limpopo. The thrifty BFAP Balanced Food Basket is generally most affordable in Limpopo and least affordable in the Western Cape, being 3.7% more expensive in the Western Cape on average during the period January 2014 to April 2016. The more diverse BFAP Balanced Food Basket is generally most affordable in Gauteng and least affordable in the Western Cape, being 2.1% more expensive in the Western Cape on average during the period of the analysis. These differences are purely driven by the differences in food preferences within the various provinces. Towards the end of this time period the cost of the baskets within the three provinces moved closer together. The expansion of the BFAP Balanced Food Basket model to a provincial level is still in progress. Ideally regional retail price differences will also be taken into consideration in future modelling exercises. For April 2016 the monthly cost of the thrifty basket for a family of four varied between R3 514 and R3 557 (compared to R3 503 for the national thrifty basket), while the monthly cost of the more diverse basket for a family of four varied between R 4 603 and R4 703 (compared to R4 616 for the national more diverse BFAP basket). It should be noted that this is not a reflection of poor consumers' actual food purchasing expenses, but rather an indication of what it will cost them to have a basic balanced diet.

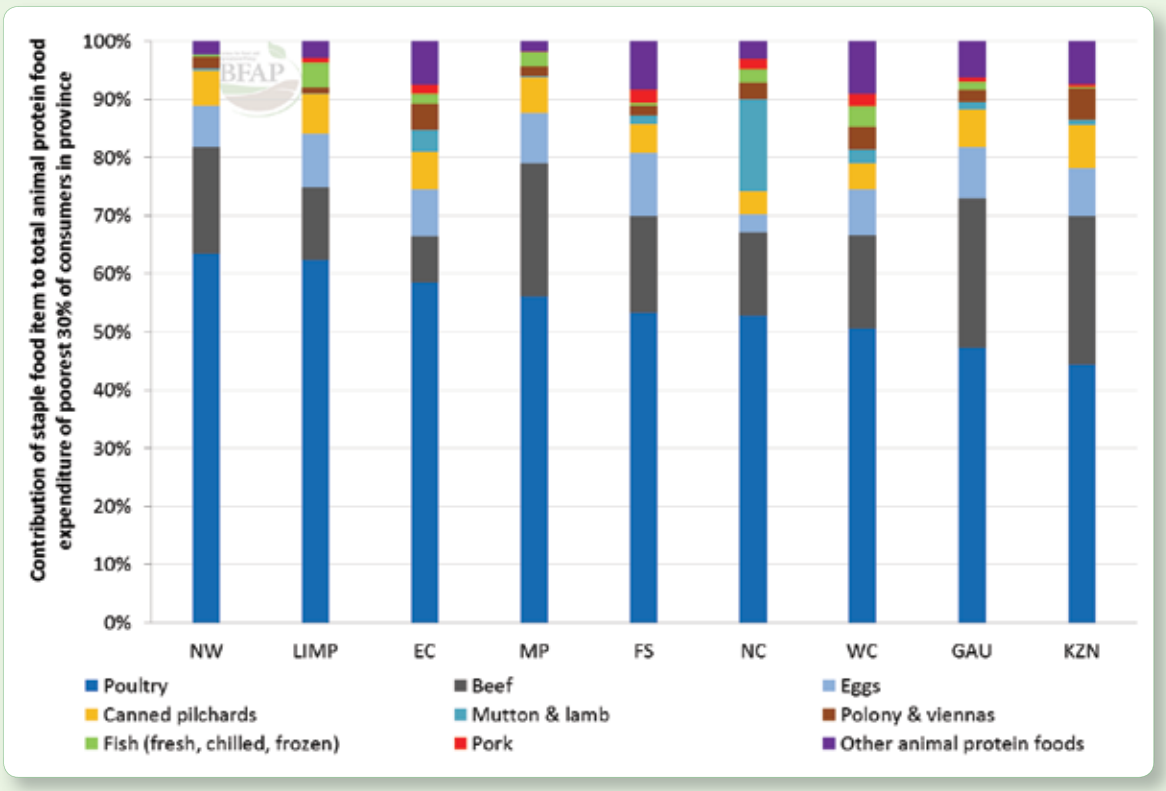

Figure 126: *Animal protein food baskets composition of poor consumers within the various provinces from an expenditure point of view*
Source: StatsSA IES, 2010/2011

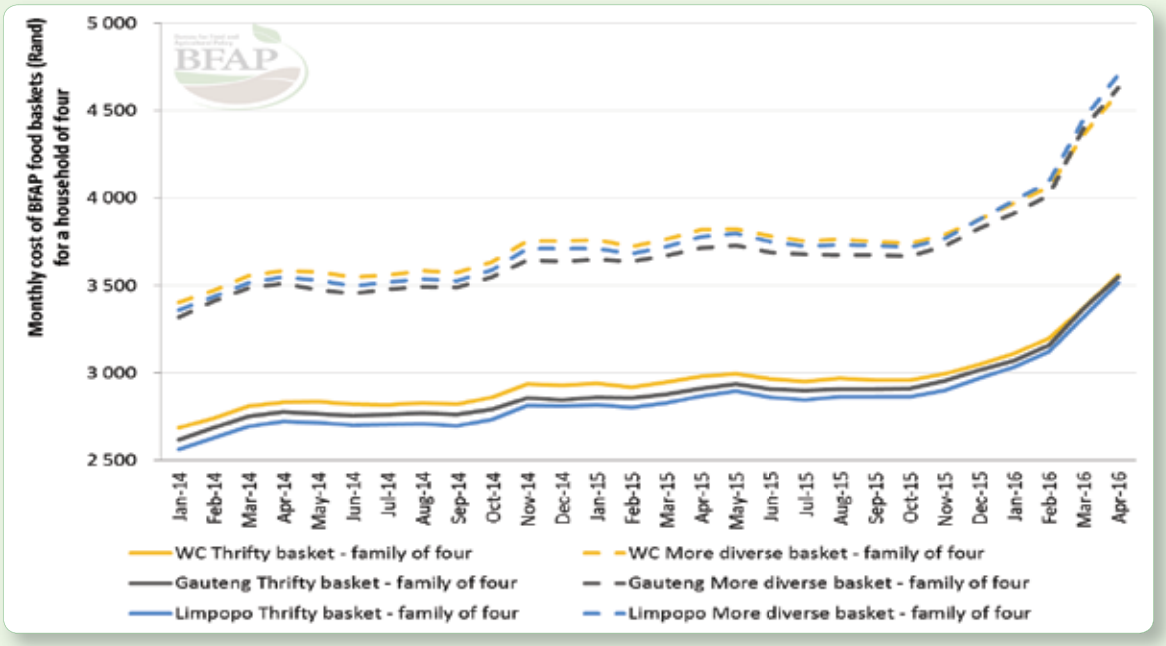

Figure 127: *The cost of the thrifty and more diverse BFAP Balanced Food Baskets for a family of four in Gauteng, Limpopo and Western Cape for the period January 2014 to April 2016*

To further explore the consumption dynamics of staple foods in South Africa, a serving cost approach is utilised, where a serving is defined as one unit according to the hospital ration and Food Based Dietary Guidelines of the Department of Health. Serving costs are calculated according to the official monthly food prices monitored by Statistics South Africa, as well as retail prices projected through the BFAP modelling system and transmission analysis for 2017. Serving sizes differ across the various starches, with one unit amounting to 30g of rice, 40g of bread, 50g of maize meal or a 130g potato. The preparation versatility of potatoes, being classified as a staple or a vegetable, most likely drives consumption despite high serving costs and given this versatility, its is not included in the context of staple serving comparisons that follows.

From a serving perspective maize meal and rice are the most affordable staple options (Figures 128 and 129):

- The cost of a serving of maize meal increased by 43.7% to R0.49 from April 2015 to April 2016, with a projected 21.6% decrease to R0.38 towards 2017. The decrease in prices is motivated by a reduction in commodity prices, due to favourable climatic conditions in the 2016/17 summer grain production season but it should be kept in mind that prices could also be subject to other cost pressure factors such as exchange rate fluctuations.
- The cost of a serving of rice increased by only 6.3% to R0.37 from April 2015 to April 2016, and by a projected 9.3% to R0.41 from April 2016 to the projected average price level in 2017. Rice being an imported good, the impact of the drought is reduced relative to macroeconomic factors such as exchange rate fluctuations and over the past few years, international rice prices have declined.

Even though the figures on total human consumption of maize and rice indicate that total human maize consumption is 367% higher than rice consumption, the comparative serving costs could motivate consumers to shift away from maize meal towards rice, even more so given the significantly shorter cooking time of rice compared to maize porridge in the light of high energy prices. However, as rice is not fortified this could imply a loss of micronutrients for these nutritionally vulnerable consumers. The cultural food association with maize porridge as a traditional staple in many South African cultural groups could also influence these consumption dynamics.

The single serving cost of bread is moving closer to the single serving cost of maize meal, being 94% more than maize meal in April 2015 and 47% in April 2016. However this ratio is projected at 88% for 2017. Keeping in mind that bread is ready-to-eat, it is becoming an increasingly attractive staple option for consumers, as total human consumption of maize is only about 40% more than total consumption of wheat. The cost of a serving of white bread increased by 9.0% to R0.72 from April 2015 to April 2016, with a projected decrease of only 0.2% from April 2016 to the projected average price level in 2017.

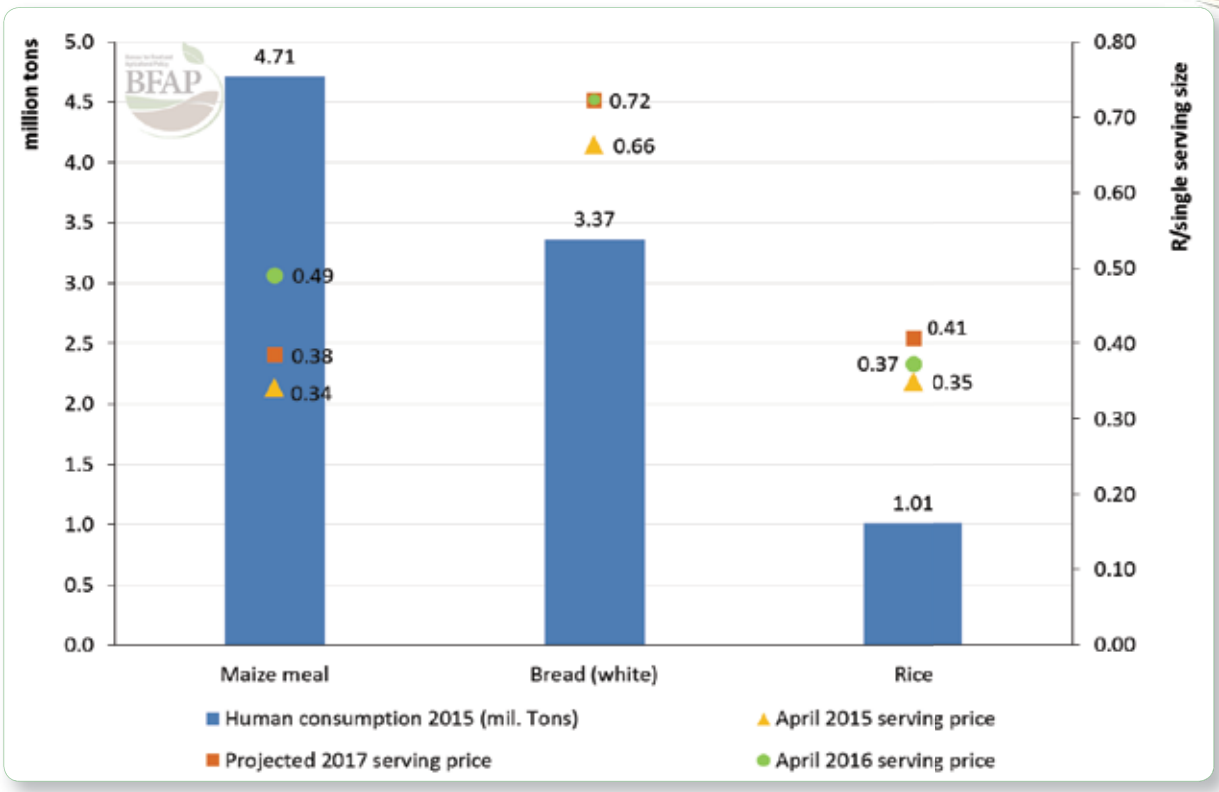

Figure 128: *South African human consumption (2015) vs. single serving costs for the major staple grains*

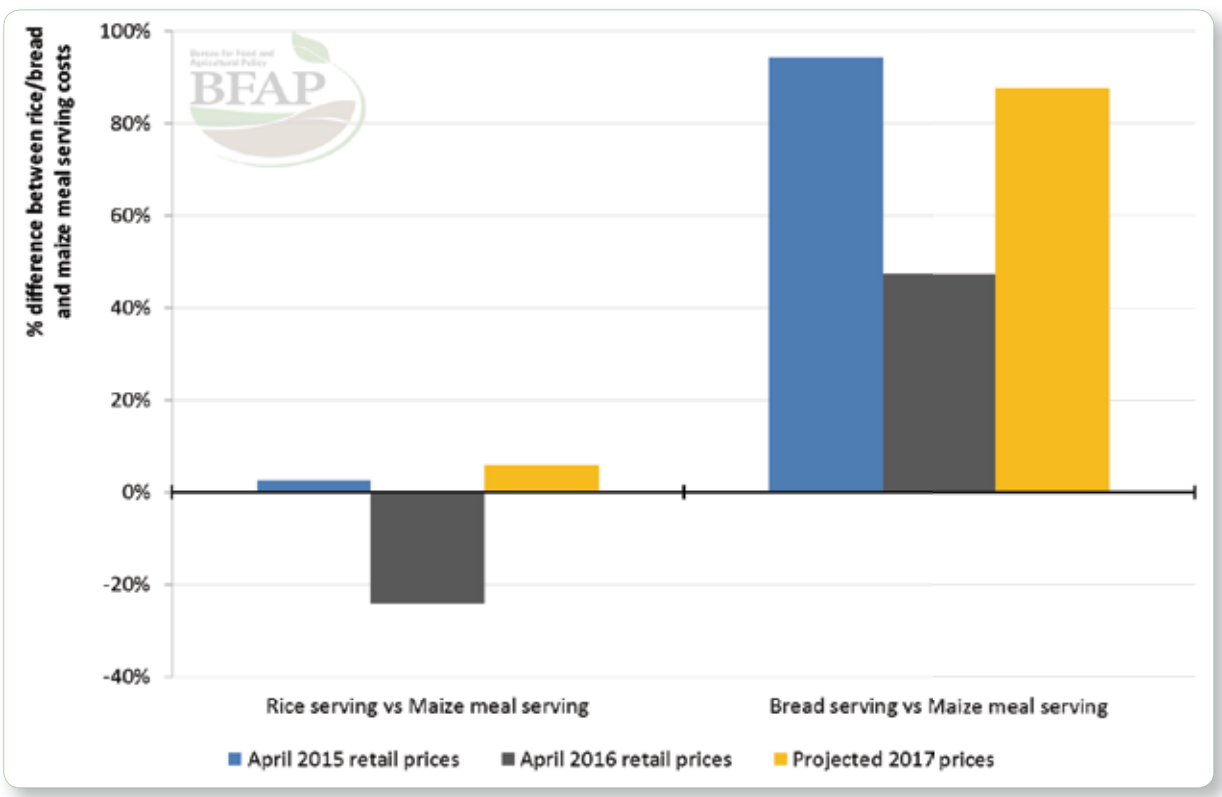

Figure 129: *Comparing the serving costs of various staple grain options relative to maize meal over time*

REGIONAL IMPLICATIONS

AFRICAN AGRICULTURAL TRANSFORMATION

Over the past decade, we have heard the term "Africa rising" and over the past five years or so, evidence of this rise has become apparent. This "evidence" gives us glimpses of change on the continent; particularly in the agricultural sector. It raises the image of a future where we have moved away from farming as means to survive towards farming as a business that thrives.

Introduction

Over the past decade, we have heard the term "Africa rising" and over the past five years or so, evidence of this rise has become apparent. This "evidence" gives us glimpses of change on the continent; particularly in the agricultural sector. It raises the image of a future where we have moved away from farming as means to survive towards farming as a business that thrives. New perspectives on land ownership, evolving farming systems, agricultural investment and climate change offer opportunities and challenges. Successful policies and prudent leadership that lends itself to the on-going transformations will assist in unlocking Africa's agricultural potential.

In this chapter we examine the changes in the macro and sector level policies that underpin the observed transformation and explore the emerging megatrends that would likely impact agriculture's contribution to future economic transformation in the region over the next decade. Understanding that the trajectories of these megatrends are not inevitable and are amenable to policy investments is critical. African policymakers can bend these trends in socially desirable directions through key areas of intervention.

Change in the Political Landscape

Macro-Economic Policies

Since 2000, macroeconomic management within Africa has improved dramatically, resulting in reduced foreign debt, shrinking budget-deficits, and rapid economic growth with some countries experiencing growth rates above or near 7%.[3] As a result, few countries have required bailouts from international financiers or experienced hyperinflation. Between 2000 and 2008, African countries trimmed their foreign debt by one-fourth; shrunk their budget deficits by two-thirds (Roxburgh et al. 2010); and inflation rates have decelerated since 2009 with a projected average of 7.2% for 2017.[4]

These positive indicators have been attributed to high prices of oil, minerals, and agricultural commodities over the past decade as well as improved macroeconomic conditions and prudent sectoral reforms, including in the agricultural sector[5]; and have resulted in increased domestic and foreign private investment across the continent (ACET 2014). Since 2000, external financial flows into Africa have quadrupled, reaching more than US$200 billion in 2014 and expected to further increase in the coming years (AfDB et al. 2014). Tax revenues are also a contributing factor to economic growth on the continent. In 2012, tax revenue, on average, accounted for 16.8% of GDP for low-income countries in Sub-Saharan Africa. Upper-middle income countries attributed, on average, 34.5% of their GDP to tax revenues (AfDB et al. 2014).

While these marked improvements in macroeconomic management are likely to continue well into the future, continuous and sustainable growth may depend on governments' ability to anticipate shocks to the system and implement policies that maintain macroeconomic stability. For example, for resource-rich countries whose growth has been supported largely by the commodity boom, the extent to which they invest to diversify their economy will shape their future growth trajectory in the event of declining prices of oil or other commodities.

Continental Commitment to Development: CAADP

At the onset of the new millennium, the United Nations set eight Millennium Development Goals (MDGs) based on their global vision of improving welfare and livelihoods in developing nations. A central effort, to eradicate poverty and hunger by 2015 took high priority. Several of the development targets hypothesized that agricultural-lead growth would directly or indirectly effect many of the MDG's objectives.

Three years after the MDGs, African Union (AU) heads of states met in Maputo, and launched the Comprehensive Africa Agriculture Development Programme (CAADP), a program of the New Partnership for Africa Development (NEPAD). CAADP was interpreted as Africa's policy framework for agricultural transformation, wealth creation, food security and nutrition, economic growth and prosperity for all (NEPAD, 2016). The leaders signed the Maputo declaration which set two targets; to attain at least 6% annual growth in agricultural productivity and to commit at least 10% of their national budget to agriculture.

[3] In fact, 6 of the world's 10 fastest-growing countries in 2000–2010 were Angola at 11.1 percent a year, Nigeria 8.9 percent, Ethiopia 8.4 percent, Chad 7.9 percent, Mozambique 7.9 percent, and Rwanda 7.6 percent (IMF African Economic Outlook 2013).

[4] In 2013, only five countries in Sub-Saharan Africa recorded double-digit inflation (Eritrea, Ghana, Guinea, Malawi, Sudan), relative to 13 countries in 2012, while 16 countries in recorded inflation rates below 3 percent in 2013 (AfDB et al. 2014).

[5] Many African countries have experienced sustained agricultural productivity growth since 2000 (Jayne et al. 2015).

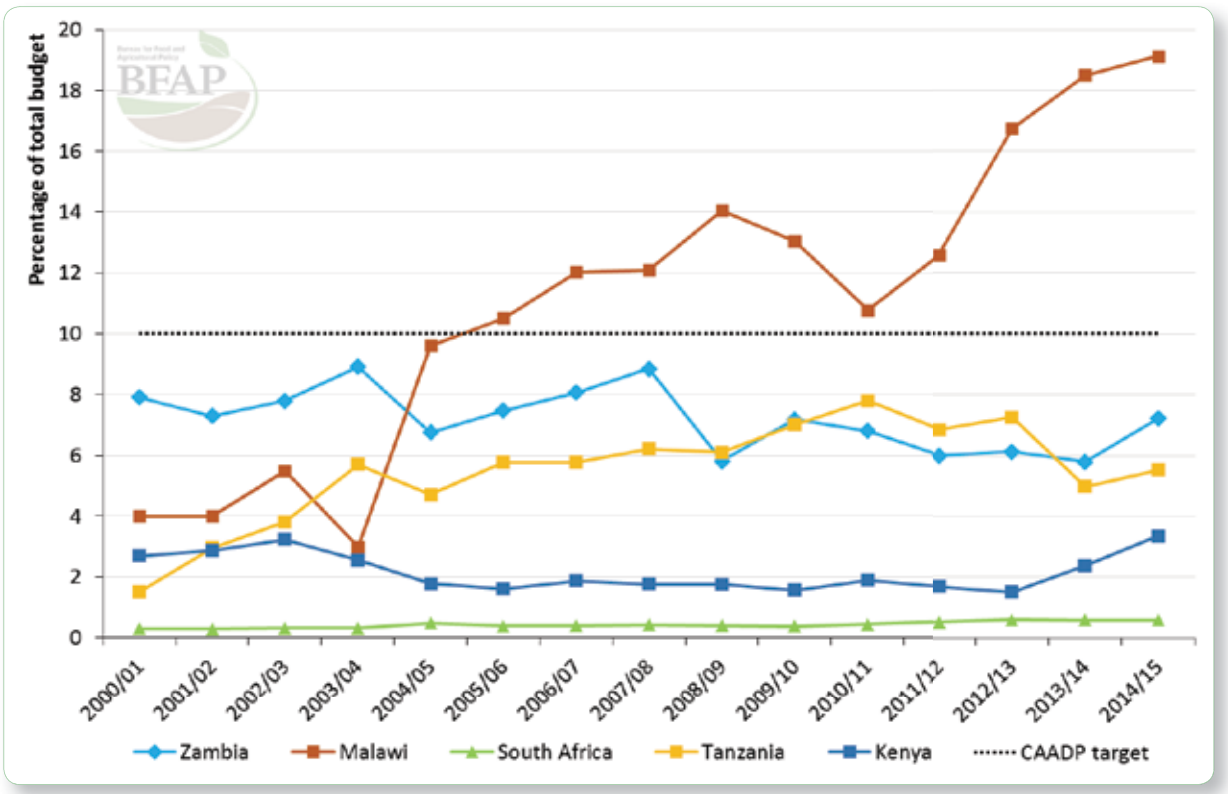

Figure 130: *Share of Agricultural expenditure in national budgets for selected countries*

Initially, the adoption and implementation of both the MDGs and CAADP was slow due to challenges of implementing policies at the national level and the priority it received at the beginning of the millennium. After the 2007/08 global food crisis, various African countries united to formulate a plan for development and identify priority sectors for investment. Outcomes from their discussions with CAADP put food security and transformation of the agricultural sector at the forefront and CAADP compact agreements were forged between these various countries (NEPAD, 2015).

Achieving the targets set in Maputo has proved to be a major challenge. Figure 130 shows that of the five selected countries, only Malawi has committed 10% of each share of national budget to agriculture since 2005. South Africa is on the other extreme with agricultural expenditure being less than 2% of the total national budget. However, it is important to note the quality of the expenditure, that is, the major components of the public agricultural expenditure as not all components induce growth in the long-term (Benin & Yu 2013). Figures 131 and 132 illustrate where the share of national agricultural expenditures are allocated for both Malawi and South Africa.

Figures 131 and 132 indicate that, of the selected components of expenditure in agriculture, South Africa allocates a greater portion to the comprehensive agricultural support program (CASP) and agricultural research while Malawi's agricultural sector budget is largely dominated by expenditures on input subsidies and on infrastructure and development. Agricultural research and development boost productivity (Diao et al, 2013) and have the impact of alleviating poverty (Alene & Coulibaly, 2009). These effects are argued to be more visible in the long term (Benin & Yu 2013). As this became understood, in 2006 the African leaders pledged to commit 1% of agricultural GDP to agricultural research and development. Additionally, input subsidies can provide efficient solutions to input problems and farmer finances, especially among small holder farmers which is a typical case of Malawi where majority of the agricultural products are from smallholding farmers. Agricultural productivity has exhibited an increasing trend since the introduction of such input subsidies. However, some have condemned input subsidies for distorting the economy's market system.

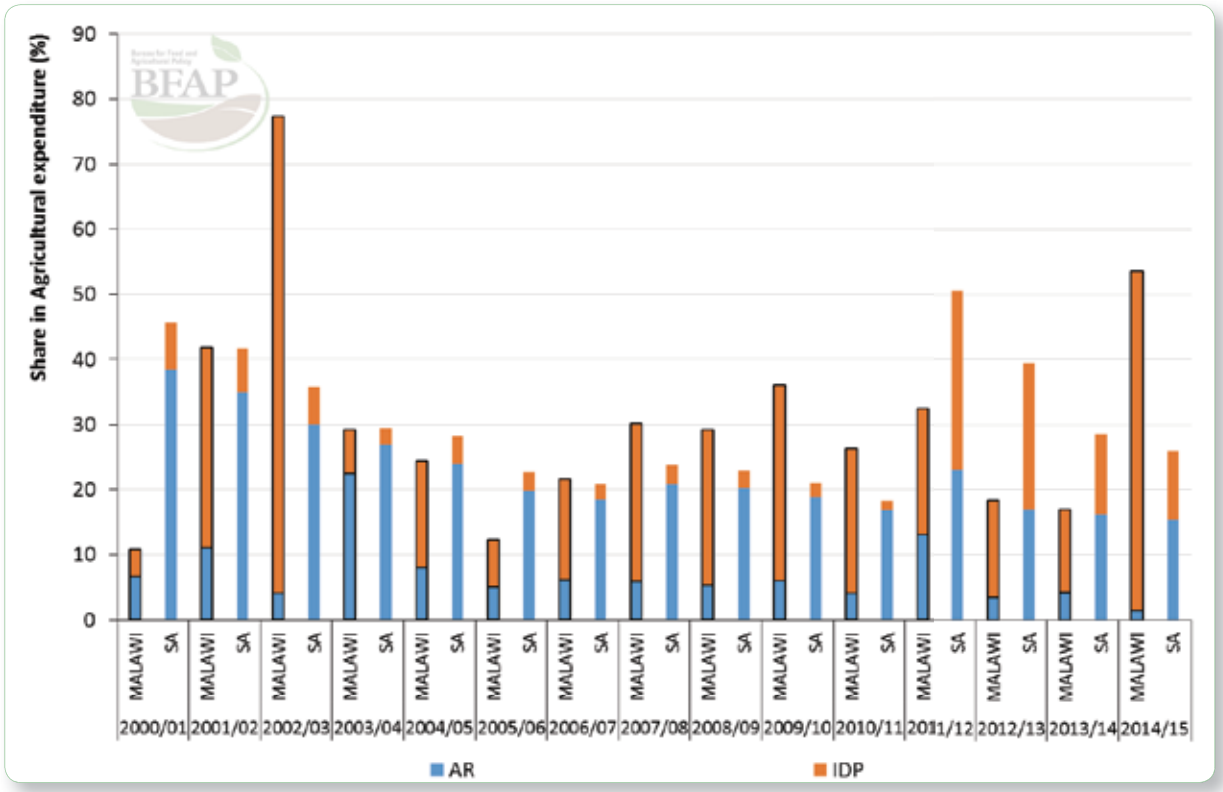

Figure 131: *Share of research and infrastructure and development program in sector's budget expenditure*

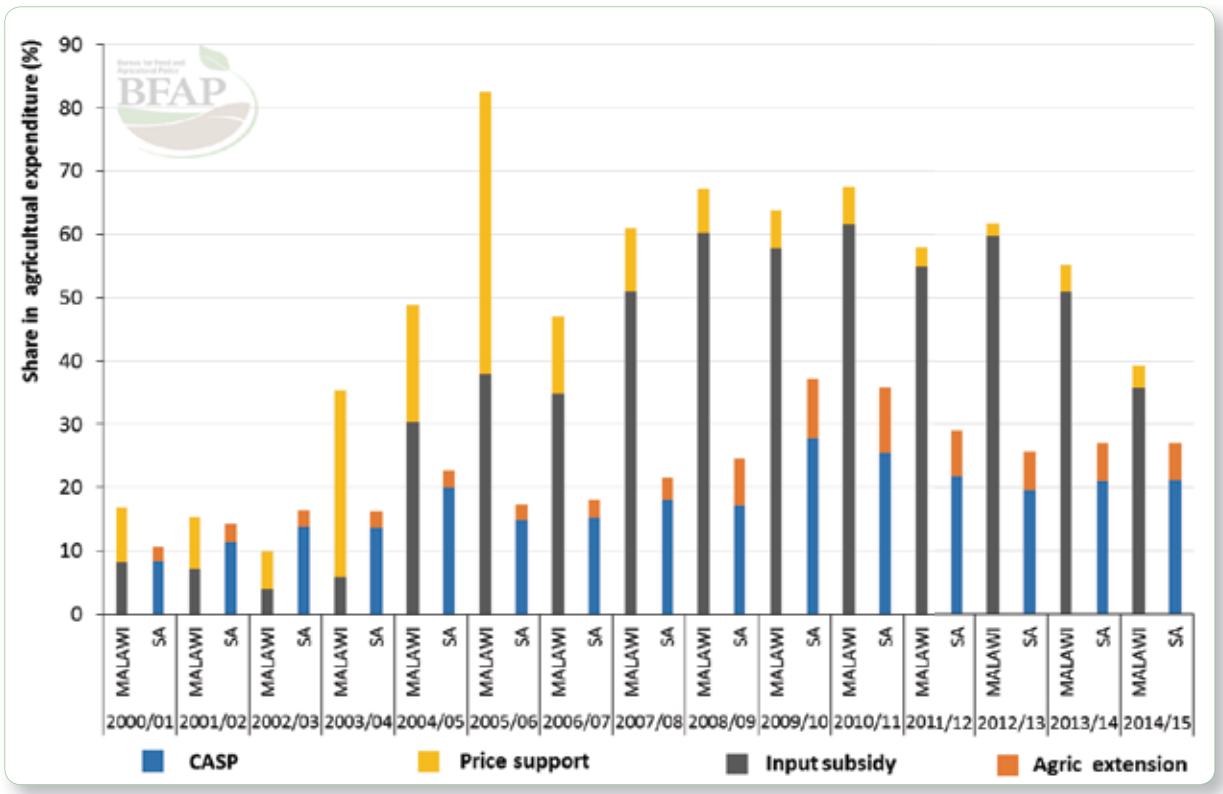

Figure 132: *Expenditure on input subsidies, price support, agricultural extension and support programs*

With poor performance in achieving the goals put forward at the Maputo declaration, in 2014 African Union leaders signed the Malabo declaration to recommit members to their 2003 targets. Though the performance has been less than expected, CAADP has been influential in changing the political agenda to be more focused on agriculture. The framework reinstated the importance of the role of agriculture in achieving its original target goals. African leaders recognized how pivotal a role the agricultural sector would play, which engendered a new perspective toward agricultural investment. Since the launch of CAADP, expenditures in agriculture have increased at a slower rate than the increase in total national budget expenditures, hence the smaller share of agricultural expenditure in national budgets (Benin & Yu 2013).

Additionally, transformations have been observed in support of smallholder farmers. In Malawi for example, input subsidy programs have been specifically made for the assistance of small scale farmers. Countries like Malawi are adjusting their agricultural policies to be in line with CAADP objectives in efforts to fast track transformation which can be hindered by poor policies implementation. Malawi is currently shifting from its farm input subsidy program (FISP) towards water management and investing more in areas such as irrigation, a key pillar of CAADP.

Domestic Marketing and Regulatory Environment

Ease of Doing Business

Beyond regional commitments under the CAADP process, there is evidence of improvements in domestic marketing policies and regulatory environments. The distance to frontier score benchmarks countries' economies with respect to regulatory best practices. It shows how the regulatory environment for local entrepreneurs has changed over time in an economy. The ease of doing business rankings are based on distance to frontier scores. An economy's distance to frontier score is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 a near perfect environment condusive for business, i.e. the frontier; which represents the best performance observed on each of the indicators across all economies.

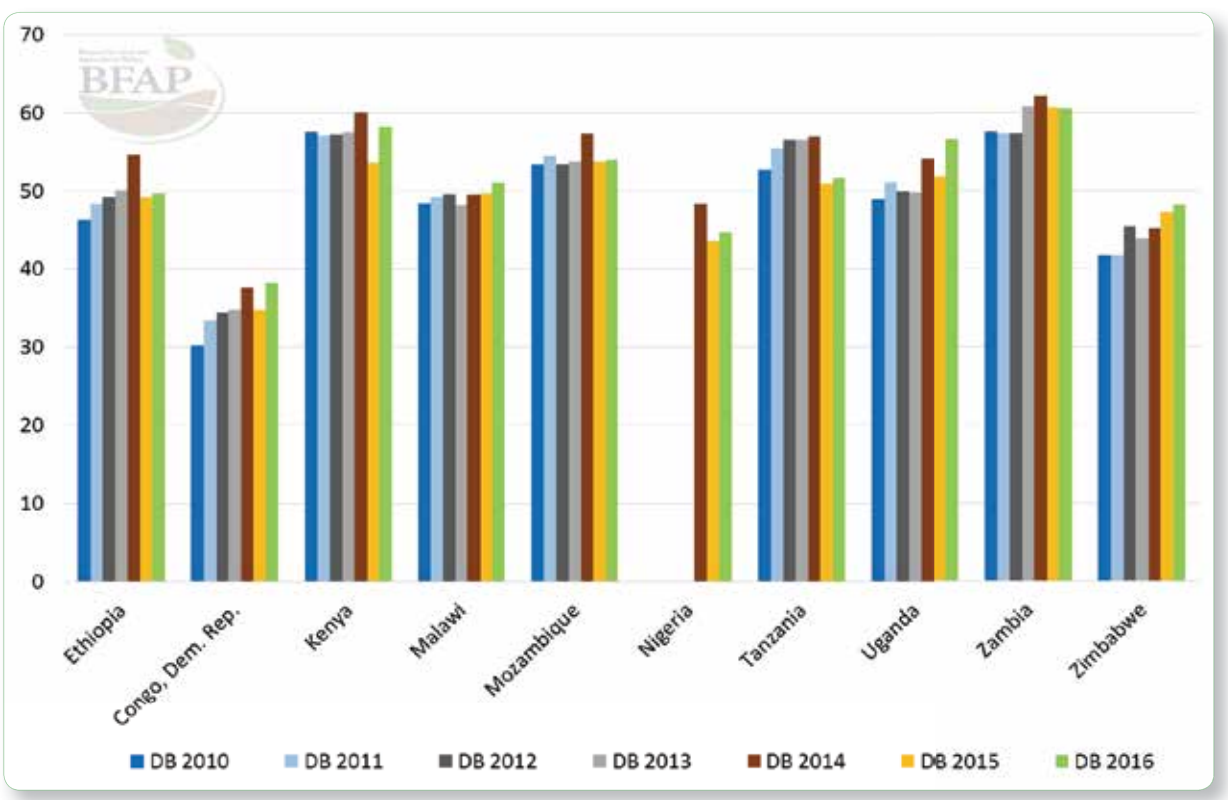

Figure 133: *Doing Business: Distance to Frontier*
Source: World Bank, Doing Business. N.p., n.d. Web. June 2016.

Except for Nigeria and Tanzania, marked positive gains towards the Frontier are evident. For example, Uganda's score rose from 49 in 2010 to 57 in 2016; indicating an improvement in the regulatory environment for entrepreneurs.

Enabling the Business of Agriculture

In the Agricultural sector, we observe improved policies aimed at supporting inclusive participation in agricultural value-chains and fostering an environment condusive to local and regional private sector investment. The Enabling the Business of Agriculture (EBA) index provides data on regulations that affect agriculture and agribusiness markets. Eighteen indicators, covering six topics, have been developed to address aspects related to production inputs and market enablers that facilitate trade between farmers, firms and producers. For example, Figure 134 illustrates the scores on dealer, standard & safety, and import requirements for tractors in seven Sub-Saharan economies.

In 2015, Mozambique, Tanzania and Uganda's enabling the Business of Agriculture indicator scores on machinery were over 80%. This implies streamlined regulations on imports of tractors relative to other SSA countries.

The Effect of the Political Change

Rising Foreign Direct Investment

Given the improvements in the enabling environment due to policy commitments and programs; South Africa's foreign direct investment (FDI) outflows to the continent has risen and diversified over the past two decades. Figure 135 illustrates the Sub-Saharan countries and level of the Food system value-chain in which South African firms have invested.

A variety of driving forces underpin multinational corporations' move into Africa, especially in the sub-Saharan Africa (SSA) region (Olatunji & Shahid, 2015; Anyawu & Yameogo, 2015a; Anyawu & Yameogo, 2015b; Dippenaar, 2009). These drivers differ with respect to the related industry as well as the host region. In the case of South Africa; domestic firms are taking advantage of their familiarity with the continent's markets. In addition, SSA's economic growth coupled with the rising urbanisation and growing consumer markets has resulted in South African firms expanding their operations into the region. Geographic proximity is also advantageous in transferring needed resources to the host countries in the region. Facilitative institutions, such as the South African Reserve Bank (SARB) and SAFEX have also played a major role in stimulating outward flow of investments. For example, in

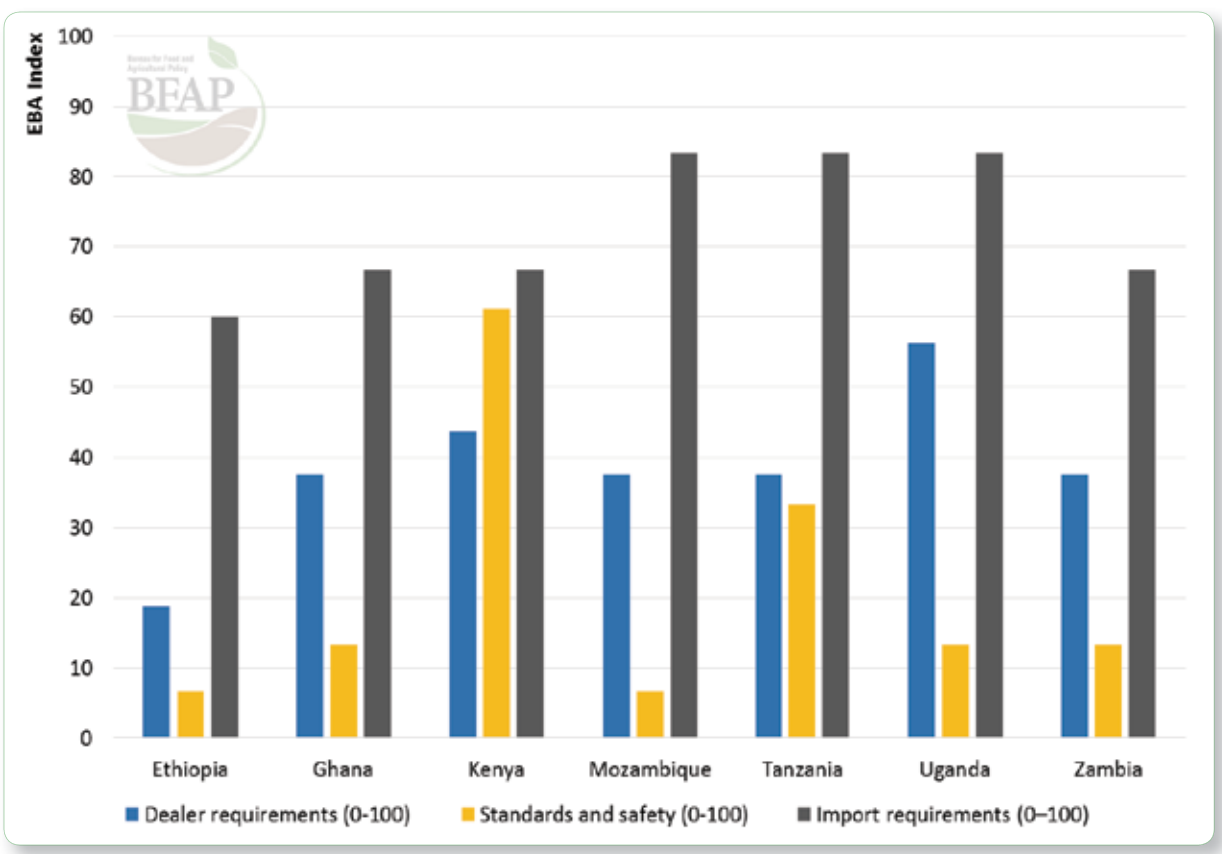

Figure 134: *Enabling the Business of Agriculture: Tractors*

Source: World Bank, Enabling the Business of Agriculture. N.p., n.d. Web. June 2016.

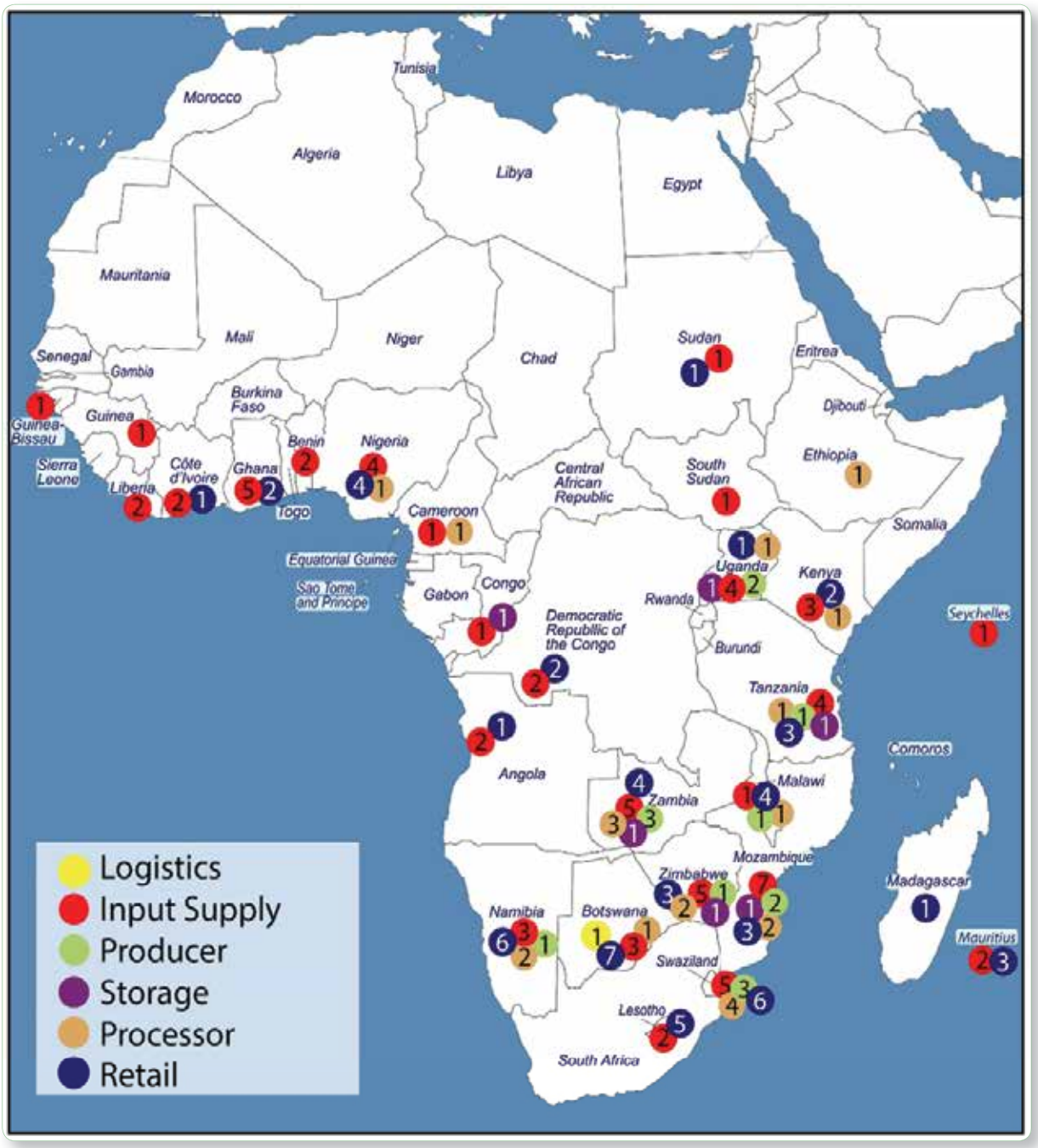

Figure 135: *South African FDI in Africa*

2002, SARB eased capital controls on local firms wishing to invest into or expand their businesses in Africa (Games, 2004).

Rise of medium-scale farmer and large-scale land acquisitions

The demand for agricultural land in Africa has risen dramatically since the surge in global food prices starting in 2007. This demand has been accelerated by agricultural subsidies and land policies in many countries. Recent studies have found relatively wealthy Africans (both rural and urban) are investing in land at an unprecedented rate leading to the rapid rise of medium-scale farmers in Africa (Jayne et. al., 2016). A study of three countries (Ghana, Kenya, and Zambia) by Jayne et al. (2014) indicated the medium-scale farms account for more land than large-scale foreign investors in all three countries and in two of the three countries, account for more agricultural land than small-scale

farmers. Existing land policies are potentially leading to greater inequality in landholdings. In some cases, it may make it more difficult for smallholder farms to expand in densely populated areas (Jayne et al. 2014; Woodhouse, 2003).

These trends reflect land and agricultural policies developed over the past several decades. Looking forward, unless new policies are adopted to reverse these trends, farm structure and farm commercialization are likely to become more concentrated across the continent over time (Woodhouse, 2003).

Rising Crop Diversification

Amidst the numerous trends and transformations taking place on the continent, we have simultaneously observed changing production patterns in African agriculture. At the national level, agricultural production has consistently exhibited an upward trend in the diversification of crops cultivated over the past several decades. It is speculated that the driving factors of this process are increased demand as a result of economic growth; urbanization; the changing consumer preferences that inevitably result when women get control over their own incomes; and, globalized markets. The implications of crop diversification have been linked to enhanced food security, rural income generation, nutritional diversity, and risk mitigation against climate change.

Across Sub-Saharan Africa, under rain-fed conditions, smallholding farmers may diversify production in order to meet home consumption demands or to reduce the risk of crop disease or climate-related crop failure (Minot, 2003). As another option, crop diversification could be associated with the transition from subsistence to commercial production due to strengthened value chains for small-holder farmers. Subsistence and commercial farmers shifting away from the production of traditional staple food commodities are incentivized by growing opportunities to produce more high-valued commercial crops for income (Delgado and Siamwalla, 1997).

In terms of primary production, evidence points to rising crop diversification across a variety of Sub-Saharan countries. To measure crop diversity, the Shannon Diversity Index (SDI) was computed for each country. This index describes the richness and evenness of crop production within a geographic location. Richness is measured by the number of cultivated crops (i.e., maize, wheat, barley, grass silage, potatoes, etc.), while evenness refers to how uniformly the arable land area is distributed among these different crops and uses (Armsworth et al., 2004).

Crop diversity can be dually expressed as the SDI or the effective number of crop species (ENCS). Figure 136 illustrates

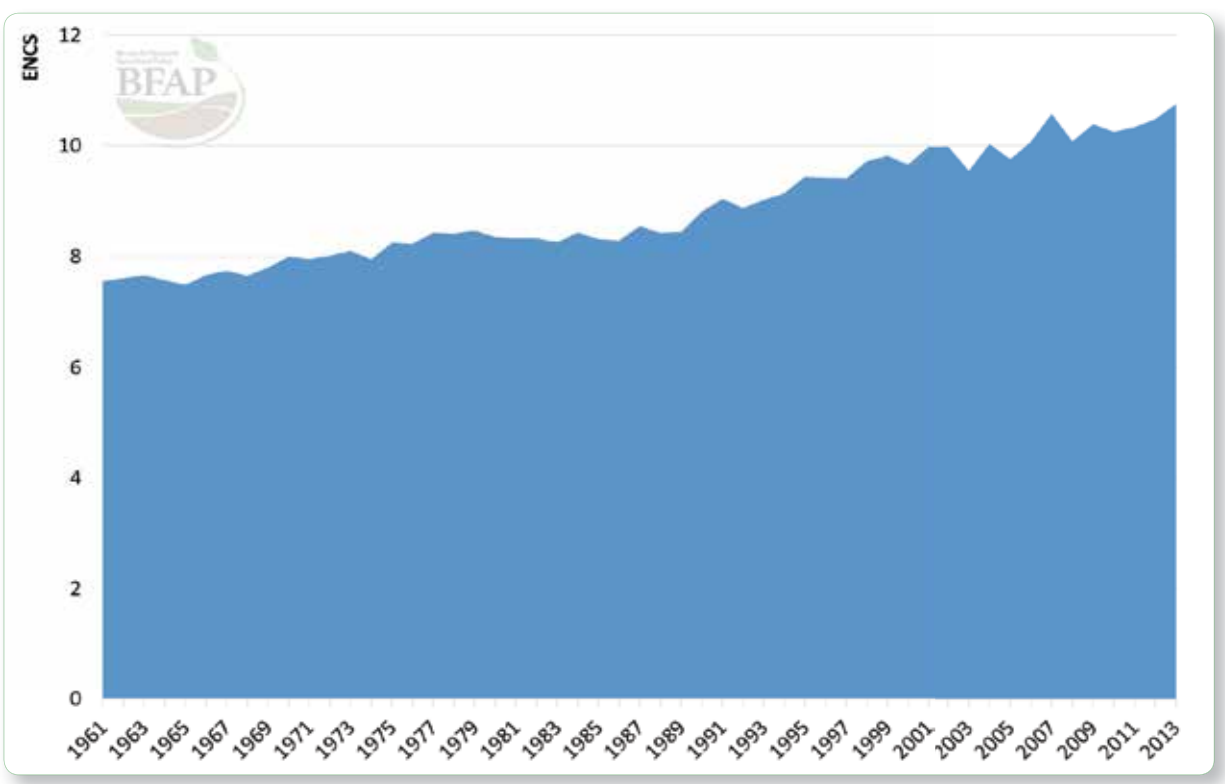

Figure 136: *Effective Number of Crop Species measure for eight sub-Saharan Africa Countries*

a combined measure of ENCS for eight ReNAPRI countries in sub-Saharan Africa it represents the mean effective number of crop species averaged across ReNAPRI countries. From 1961 through 2013 an increase from 7,55 to 10,75 is observed. In the early 1990's there is a noticeable increase in the ENCS, relative to the prior decades.

Different researchers have speculated that changing crop diversity is the result of several factors. Some include, global market forces, such as rising demand in China and India for cash crops such as soya beans, tobacco, ground nuts, etc. Alternatively, climate change and risk mitigation strategies of smallholder subsistence farmers could also underpin the observed shift in crop diversity.

Given the initial evidence, from an economic development and policy perspective, it will be advantageous to understand how crop diversification impacts economies at different levels. More specifically, to what extent growth in agricultural value-added to GDP is derived from crop diversification, and how policy and public investment strategies would need to focus on credit, transportation infrastructure, and market information systems in order to facilitate appropriate market access.

Megatrends

Strong economic growth linkages between agriculture and other segments of the economy mean that expanding the productive capacity and economic returns of agriculture could promote an inclusive pattern of economic growth with stronger multiplier effects on employment creation and poverty reduction. However, realizing this potential will depend on the effectiveness of policies and programs in creating an enabling environment by responding to key patterns of change in the economic landscape that would likely affect the contribution of agriculture to the overall economic transformation agenda.

In this section we explore the emerging megatrends that would likely impact agriculture's contribution to future economic transformation in the region over the next decade. Understanding that the trajectories of these megatrends are not inevitable and are amenable to policy investments is critical.

Youth Bulge & Employment

With over 60% of Africa's population currently under 25 years old, 17 million people will enter the labour force each year over the next decade (Losch 2012; IMF 2015). It is estimated using current rates of employment growth that less than half of those entering the labour force each year will be absorbed into gainful off-farm wage jobs. An otherwise bullish assessment by the McKinsey Global Institute (Fine et al. 2012) indicates that under the most favourable scenario the supply of wage jobs in manufacturing, services, and government is not growing rapidly enough to absorb more than two-thirds of the region's rapidly rising labour force. Therefore, family farming becomes essential in providing the remaining youth with employment opportunity in the agriculture and informal sector (which is heavily dependent on agriculture as a source of demand). The alternative of joining the ranks of the unemployed will bring major political risks. Fortunately, policy and public investments can rapidly improve the incentives and the profitability of engaging in farming—a major opportunity both for the youth and for governments.

This trend is perhaps the one with the highest degree of certainty. This also means African governments can anticipate and respond to the influx of workers. Instituting an enabling environment that rapidly promotes private investment and job creation in nonfarm sectors and labour-intensive forms of agriculture would have high payoffs and raise the likelihood that a country's economic transformation will be relatively smooth rather than painful and protracted.

Many expect urbanization, income growth and an expanding population to result in a migration of labour from farming to nonfarm sectors as well as the downstream stages of food systems. However, in the recent past the number of people employed in primary agriculture rose in select African countries. Compared with China, where the agricultural labour force peaked around 1990 and has since been declining, each of the eight African countries examined by Yeboah and Jayne (2015) using national census data show increases over time in the number of people employed in agriculture. Consistent with employment trends by the Groningen Global Development Centre (2013), a recent flagship World Bank report (Filmer and Fox 2014) projects that family farming will remain the single largest source of employment for at least the next several decades.

In light of these trends, employment opportunities in some nonfarm sectors are expected to rise rapidly, but agriculture will still remain the main source of employment over the next several decades in most African countries. Policies that enhance productivity in agriculture appear to have the greatest potential to directly improve rural livelihoods and stimulate effective demand and growth in nonfarm job opportunities through multiplier effects that may be generated from productivity gains.

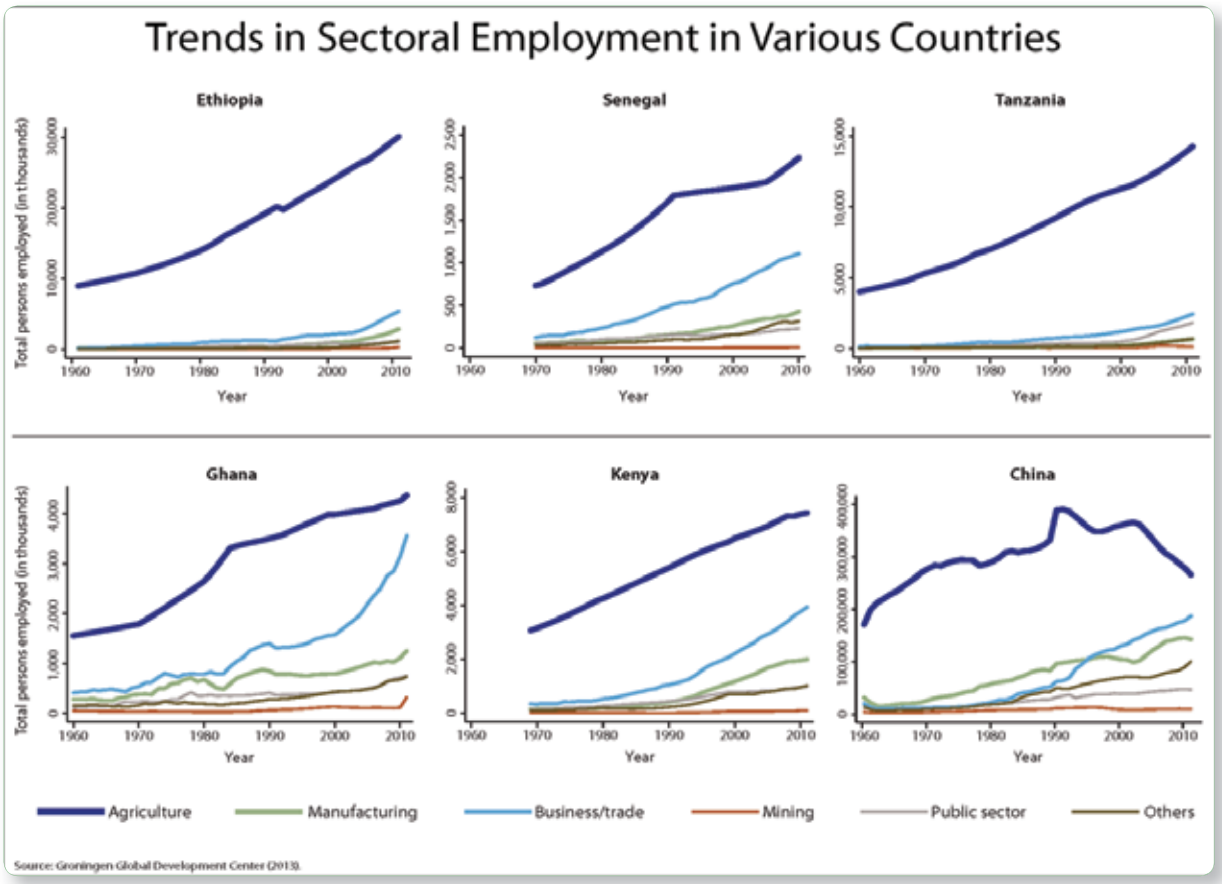

Figure 137: *Trends in Sectoral Employment in Various Countries*
Source: Groningen Global Development Indicators, 2013

Land Availability and Soil Degradation

Land pressures in the densely populated farming areas of Africa are causing a gradual shrinking of farm sizes over time (Headey and Jayne 2014). Smallholder farmers respond by more continuously cropping their fields every year and fallows have largely disappeared in densely populated areas. Continuous cultivation of existing plots would not necessarily pose problems for sustainable intensification if soil quality was maintained or improved over time through sufficient use of fertilizers, soil amendment practices, and other land-augmenting investments. However, a major body of evidence in Africa points to soil degradation arising from unsustainable cultivation practices in high-density areas of the continent (Stoorvogel and Smaling 1990; Drechsel et al. 2001; Tittonell and Giller 2012).

Loss of micronutrients and soil organic matter pose special problems, both because they cannot be ameliorated by the application of conventional inorganic fertilizers and because they tend to depress the efficiency of inorganic fertilizer in contributing to crop output (Shaxson and Barber 2003; Marenya and Barrett 2009; Vanlauwe et al. 2011). Because of continuous cultivation and lack of crop rotations, soil organic carbon levels have reached very low levels in high-population-density Africa (Powlson et al. 2011; Vanlauwe et al. 2011). Giller et al. (2006) and Tittonell et al. (2007) conclude that smallholder farmers are largely unable to benefit from the current yield gains offered by plant genetic improvement due to their farming on depleted soils that are nonresponsive to fertilizer application.

Rising rural population density and associated land pressures are important underlying drivers of these processes, yet they are clearly within the scope of policy to ameliorate. A more holistic approach to sustainable agricultural intensification can succeed in reversing these trends and creating the potential for productivity growth in high-density smallholder environments (Snapp et al. 2010; Powlson et al. 2011).

Climate Change

Given the vast variation in climatic zones on the continent, the impacts of climate change on country-specific farming systems will vary and is difficult to predict. However, there is consensus on two general predictions of climate change; these include greater variability in agricultural production and a decline in crop productivity (Schlenker and Lobell 2010).

In sub-Saharan Africa's case, the predominance of rain-fed cropping systems and extensive, pasture based livestock production make this region particularly vulnerable to climatic variability. History also suggests that the region is particularly prone to recurrent drought conditions and between 1990 and 2013, almost 43% of the drought events recorded in the EM-DAT[6] database occurred in sub-Saharan Africa. The severe impact of such events is evident from the extremely warm and dry conditions that accompanied the strongest El-Nino phenomenon to date in the 2015/16 production season.

In 2015, Ethiopia recorded its lowest annual rainfall in 30 years and in South Africa, annual rainfall declined to the lowest level since 1904. The monthly distribution of rainfall is as important for agricultural production however and the Global Information and Early Warning System on food and agriculture (GIEWS) indicates that the limited and uneven distribution of rainfall through the optimal planting period for summer crops (October to December) across the Southern African region had an adverse impact on early crop development. The impact has been particularly severe in the maize market, which represents the principal food staple in the region. The latest production estimates reflect a decline of almost 30% in South Africa's maize crop in 2016 from the already below average levels of 2015 (Figure 138). Further North, the drought was less severe, with Zambia indicating a year on year increase from 2015 levels, though the 2.8 million ton crop remains slightly below the 3 year average. Given the decline in South Africa, traditionally the largest surplus producer in the region, as well as Mozambique, Zimbabwe and Malawi, Zambian surpluses are unlikely to be sufficient to supply the regional requirement. Furthermore Zambia has a history of export restriction to ensure domestic supply. The shortage has raised significant food security concerns and consequently prices across Southern Africa have soared, as illustrated in US dollar terms in Figure 138.

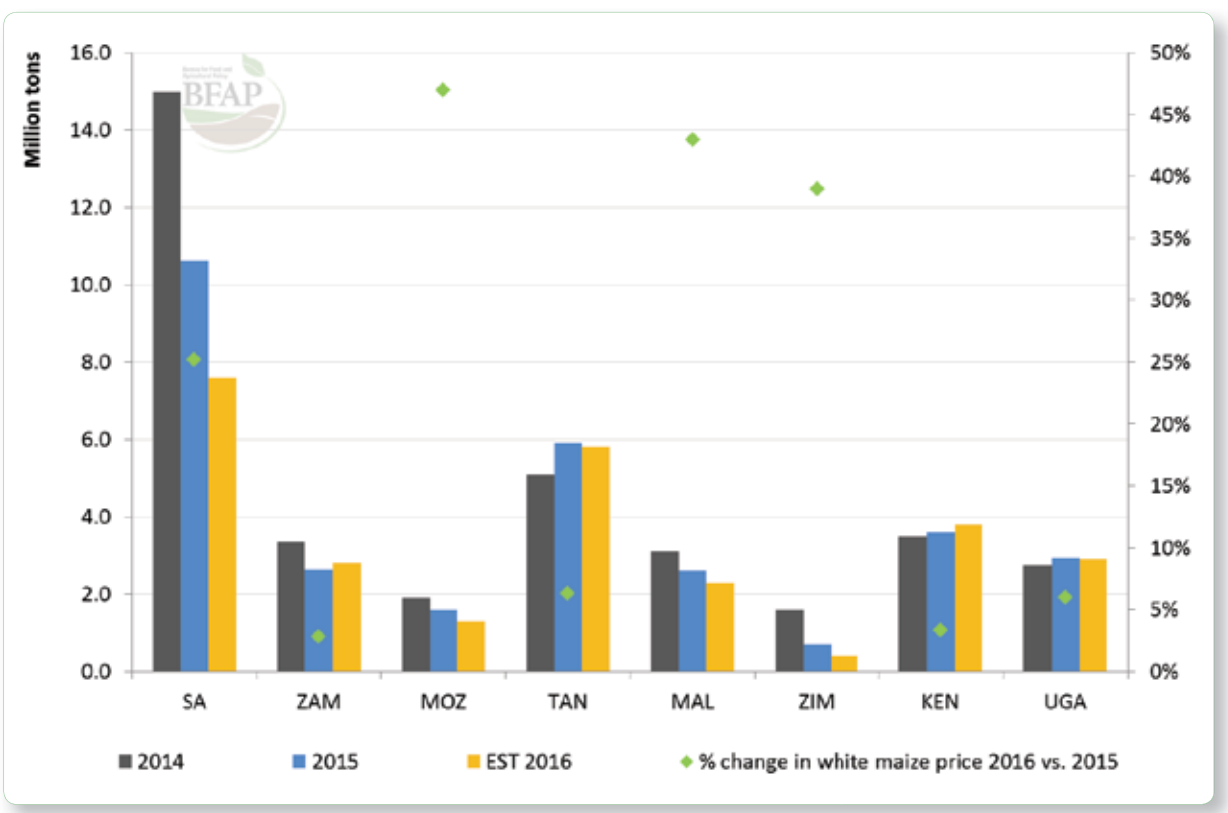

Figure 138: *Changes in production and prices as a result of the 2015/16 drought*

[6] International disaster database from the Centre of Research on the Epidemiology of Disasters. www.emdat.be/database.

Price increases illustrated in Figure 138 are well supported by concerns regarding supply. The region as a whole has maintained a positive aggregated maize trade balance between 2010 and 2014, yet as a result of the drought conditions, imports are projected to rise significantly in 2016, the bulk of which will originate from outside the region. Coming as it did in a period where global stocks have reached record levels, the need to import maize from outside the region seems inconspicuous, yet many currencies have devaluated considerably against the US dollar over the past year and import parity prices have soared as a result. Furthermore, stringent regulations related to Genetically Modified (GM)[7] technologies , as well as the preference for white maize[8] limits potential procurement options, raising concern related to availability of white maize and a substantial premium over yellow maize, which is freely available in the world market. Expected import volumes will also place considerable strain in infrastructure and in South Africa, the public and private sector have already formed the Grain Logistics Coordination Committee in an attempt to reduce logistical bottlenecks. Imports are expected to flow throughout the year and thus maize prices are projected to remain high until March 2017, which represents the first opportunity for early deliveries to alleviate some of the pressure on low stock levels.

Climate change and variations in crop productivity extend beyond East and Southern Africa. While cereal production yields are expected to be higher than average for the West African Region and the Sahel, a shortened rainy season in Chad, northern Benin, Togo and Ghana has reduced grain production and affected other staples such as plantain. This could lead to price increases affecting more vulnerable populations in the near and long term (FAO, 2016).

Previous predictions of global food production assumed the United States, Europe and parts of the Far East would continue to increase their yield. However, in the developed world, 31% of total wheat, rice, and maize production has reached a yield plateau, experienced an abrupt decline in yield growth rates, or both (Grassini et al. 2013). This has serious implications for global food security.

In contrast, Africa's low levels of yields indicates the potential to experience continued growth in food production before reaching the region's biophysical limits. Africa and Latin America are experiencing the world's fastest growth in the share of global farmland under cultivation (Headey 2015). However, feeding the global population through expansion of agricultural land will involve degradation of natural ecosystems.

The alternative, ecological intensification of agriculture would require minimizing the constraints to appropriate technology adoption; focusing on sustainable water use through irrigation; and implementing best farming practices. Given the rising competition for water (to date, 70% of available water is used by irrigation farming) it will be imperative that agriculture focus on developing irrigation technology that improves water use efficiency and enhances our ability to adapt to climate change (Cassman et al. 2010).

Ultimately these effects of climate change are largely exogenous in the short run from the standpoint of African policymakers, but it is quite possible that future land policies affecting the rate at which forest- and grassland are converted to farmland may influence the degree of climate variability experienced in some parts of the region. In this way, factors affecting the supply of and demand for farmland in Africa may affect the pace of this trend in the coming decades. Moreover, if global climate change induces greater volatility in world food prices, this may induce public and private investment responses at certain stages of the food system, for example, local storage and a shift toward food self-sufficiency, or investments in water-saving technologies and adaptive farm management practices.

Intra-regional trade

Recent studies have provided evidence of a rising middle class in Africa (for example AfDB 2011; Kearney 2014; Deloitte and Touche 2013; Tschirley et al. 2014). On this basis they project a rapid modernization of Africa's food systems and diets, with major employment growth being envisioned in the downstream stages of the food systems. However, these conclusions are highly sensitive to how middle class is defined. Potts (2013) argues that urban income growth is quite narrow in most African countries for which data exist. Furthermore, Jedwab (2013) and Gollin et al. (2013) indicate that GDP growth in many African countries is driven by narrow growth in natural resource sectors. These contribute little to employment creation and raise the spectre of urbanization without income growth or economic transformation.

The potential for urbanization and income growth to stimulate job expansion in downstream segments of the food system depends

[7] Regulations related to GM technology vary across the region, with the bulk of countries not accepting GM maize at all. South Africa is the exception, as GM maize can be imported provided that it is registered domestically. Consequently, South Africa is currently unable to procure white maize from the United States.

[8] There are only a few white maize surplus producers in the world of which Mexico and the US seem to be the only viable sources of surplus white maize for the export market in the current marketing season.

on where the primary agricultural products come from. If domestic farm production mainly due to farm commercialization is able to keep up with rising urban demand, obvious growth of jobs will occur in food assembly, wholesaling, and meeting the demand for food away from home, in addition to processing and retailing. In contrast, if domestic production cannot keep up with food demand, imported food (both processed and raw) will take an increasing share of consumers' expenditures. The importation of processed foods may still stimulate job growth in food retailing, but will cause loss of potential for job expansion at the upstream stages of the food system, including agricultural input supply and agri-business services, farm production, financial services for the farm sector, storage, and local trading, which can otherwise occur if consumer demand is met through domestic production.

Worries about the loss of jobs within the agri-food system to foreign suppliers appear warranted. Projections by the OECD and FAO of sub-Saharan Africa's consumption and production of agricultural commodities over the period 2016–2025 also indicate that an increasing share of the region's growing demand for food products will be met by imports (Figure 139), particularly for higher value commodities. Private firms in the region repeatedly warn that while urban populations and hence demand are growing rapidly, major concerns exist over whether adequate supplies can be sourced through local production to meet this demand. Concerns over the scope for local production to respond to rising consumer demand are especially warranted in many countries where the potential for expansion of high-potential cropland is limited (Chamberlin et al. 2014).

Capturing the potential of urban growth to stimulate employment growth in the agrifood system will therefore depend on stimulating the domestic production base—itself a potentially major source of growth in wage employment and self-employment in the coming decades (Losch 2012; Filmer and Fox 2014). While some areas of Africa may experience broad-based income growth and urbanization over the next several decades, the pace and extent to which this occurs is likely to vary substantially across countries, depending on government policies and the composition of public expenditures.

One of the factors increasing the risk to domestic producers is high price volatility in the region. Particularly in key food staple markets, the perceived need by governments to stabilise prices and supply has motivated continued intervention, despite an international drive towards liberalisation (Minot, 2014, Jayne & Tschirley, 2009). In reacting to market shocks, the need to balance short term food security objectives with longer term goals of raising productivity remains a challenge to policy makers, yet the unpredictability and ad-hoc nature of government activity in markets has resulted in additional risks and costs for the private sector. Consequently it impedes investments that could improve access to markets and services and contrary to stabilisation objectives, observed volatility over the past decade has been higher in markets where governments intervene most actively (Chapoto & Jayne 2009; Minot 2014; Jayne 2012).

The role of increased intra-regional trade in reducing volatility and improving food security has been recognised in the Malabo Declaration on accelerated agricultural growth, which committed to boosting intra-African trade in agricultural

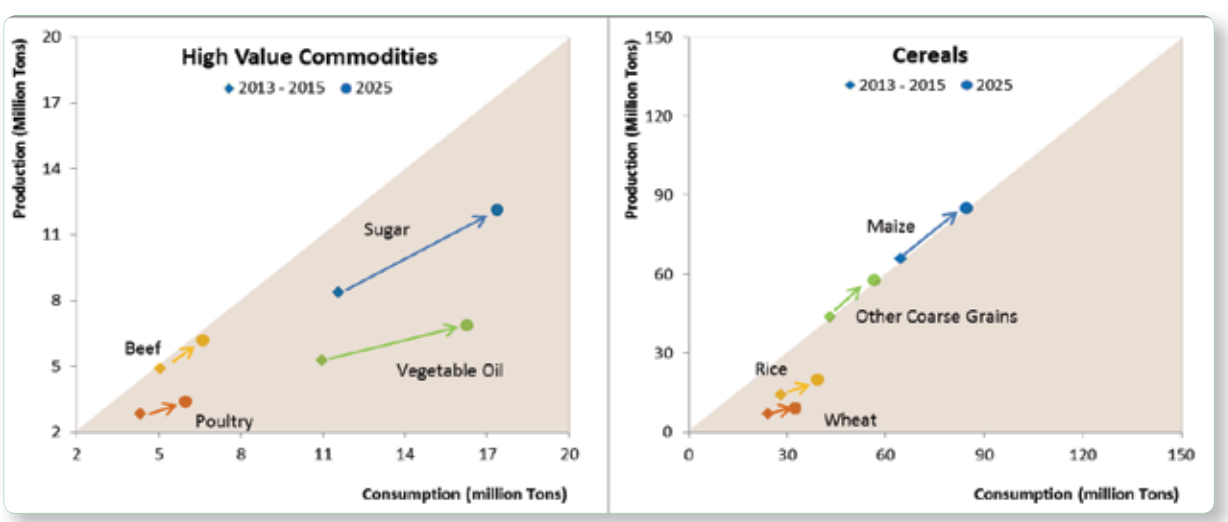

Figure 139: *OECD-FAO projections for production and consumption of selected agricultural commodities: 2025 vs. 2013-2015 base period.*
Source: OECD-FAO, 2016

*Note that along the 45 degree line, production matches consumption, implying self-sufficiency. Above the line is indicative of an exportable surplus, whilst below the line points to the need to import

commodities and services. A reduction in barriers to regional trade offers an inexpensive means of reducing domestic price volatility (Dorosch et al., 2010) and the World Bank (2012) indicates that an enabling environment which allows intra-regional trade to occur more efficiently has enormous potential to improve food security in the region. This positive contribution is already evident in regions where cross border trade is prevalent (Mozambique-Malawi, Malawi-Zambia, Uganda-Kenya), with neighbouring countries essentially pooling production in order to stabilise markets (Chapoto and Sitko, 2014).

Within Eastern and Southern African maize markets, where the bulk of trade volumes are intra-regional, bivariate regression analysis indicates that total trade volumes are significant in reducing price volatility, suggesting that liberalised trade regimes will be effective as a means of reducing the risks associated with volatility (Davids, et.al., 2016a). Much of this potential remains unexploited however, due to informal trade charges, political borders and limited transportation infrastructure. The World Bank (2012) notes that high transportation rates related to the lack of investment in modern trucking and shipping capacity remains a key limitation to efficient cross border trade. Different studies have estimated that a 50% reduction in transportation rates in Mozambique could increase real agricultural GDP by 7%, whilst reform that delivers more competition could reduce the cost of transporting staples in West Africa by 50%. Incentives for such investment remain weak however due to a lack of information, inefficient border crossings and a lack of transparency related to discretionary trade policies (World Bank, 2012). As a result, price transmission between different markets in the region remains slow (Davids, et. al., 2016b).

Concluding Remarks

Africa's next generation is destined to see rapid growth and agricultural transformation. The far-reaching nature of these mega-trends is evident as we see agriculture taking an increasingly prominent role in economic growth. Abundant opportunities for expansion and prosperity are accompanied by challenges that must be addressed with good governance and management. How such growth will manifest will largely depend on Africa's leaders' and policy makers' ability to harness the continent's abundant but at times fragile resources. If managed appropriately, this could lead to unprecedented agricultural productivity growth and contribute to Africa's role in becoming a major food supplier in the world economy.

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