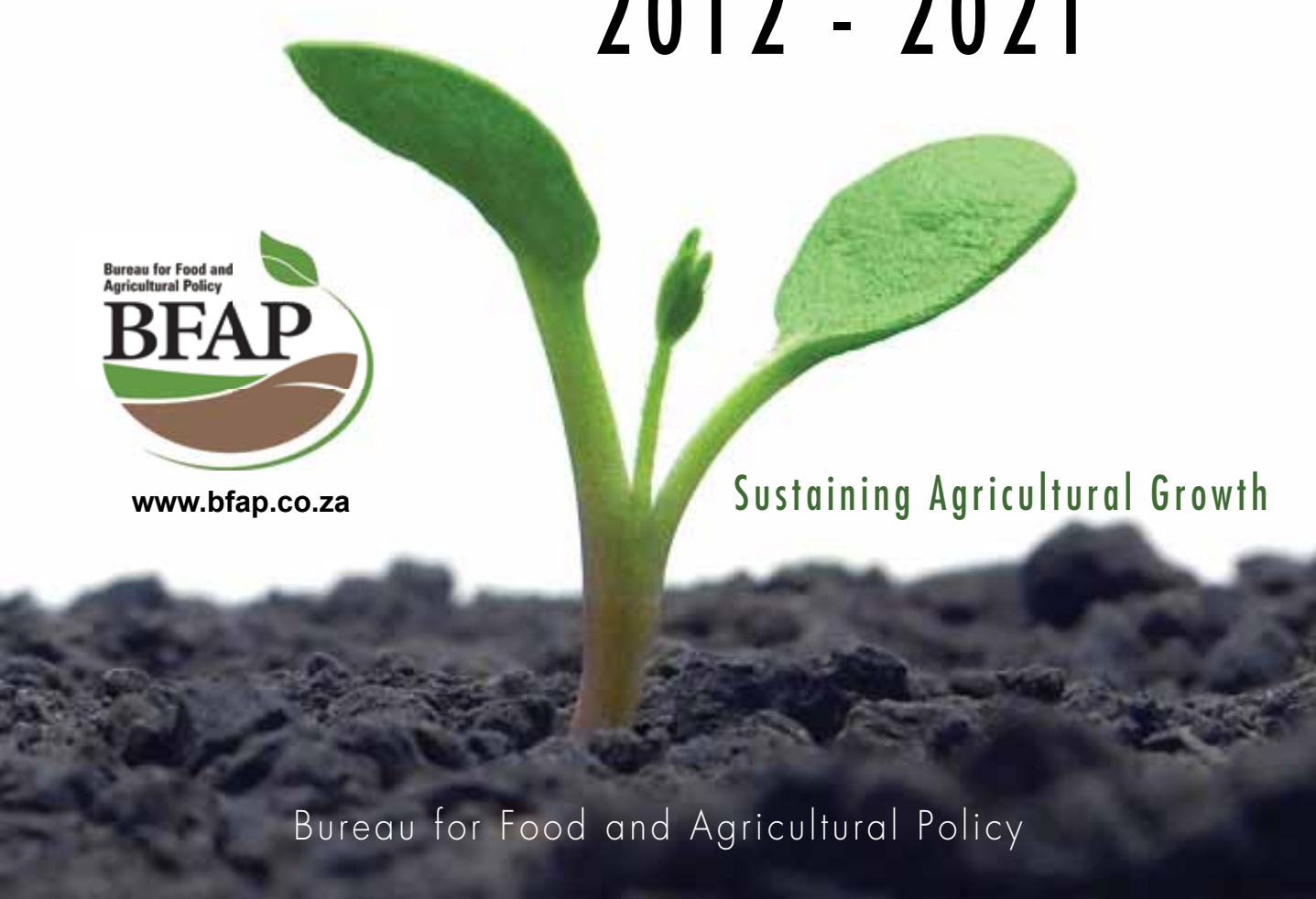
BFAP BASELINE
Agricultural Outlook
2012 - 2021



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Foreword

FOUNDED IN 2004, the Bureau for Food and Agricultural Policy (BFAP), with offices at the University of Pretoria, the University of Stellenbosch, and the Western Cape Department of Agriculture, is made up of 37 public and private sector analysts and experts who pool their knowledge and research to inform decision-making within South Africa's food production and processing system. BFAP has become a valuable resource to government, agribusiness and farmers by providing analyses of future policy and market scenarios and measuring their impact on farm and firm profitability. BFAP also has international partners with which it shares ideas. The Bureau consults to both private sector national and international companies as well as the national government

BFAP acknowledges and appreciates the tremendous insight of numerous industry specialists over the past years. The financial support from the National Agricultural Marketing Council (NAMC), the Western Cape Department of Agriculture and ABSA Agribusiness towards the development and publishing of this Baseline is also commendable.

Although all industry partners' comments and suggestions are taken into consideration, BFAP's own views are presented in the baseline publication.

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Context and purpose of the Baseline

THE BFAP BASELINE 2012 presents an outlook of Southern African agricultural production, consumption, prices and trade for the period 2012 to 2021. This outlook 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, which is an econometric, recursive, partial equilibrium model. For each commodity, the important components of supply and demand are identified and equilibrium established in each market by means of balance sheet principles where demand equals supply. A number of critical assumptions have to be made for baseline projections. One of the most important assumptions is that average weather conditions will prevail in Southern Africa and around the world: therefore yields grow constantly over the baseline as technology improves. Assumptions with respect to the outlook of macroeconomic conditions are based on a combination of projections developed by IMF and the World Bank. 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 the new equilibrium in agricultural markets. Markets are extremely volatile and the probability that future prices will not match baseline projections is 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. This 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 effect of long-term structural changes on agricultural commodity markets, such as the impact of the sharp increase in input costs on supply response.

To summarise, the baseline does NOT constitute a forecast, but rather 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. Scenarios and risk analyses are, however, not published in the baseline, but prepared as independent reports on demand of clients. The BFAP Baseline 2012 should 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

THE KEY ASSUMPTIONS and features of the 2012 BFAP Baseline are:

- A stagnant and declining oil price
- A dampened global and SA economic growth rate
- A gradual depreciation in the exchange rate
- High world agricultural commodity prices over the medium term with a declining trend in the long run
- Strong growth in SA real gross income of the agricultural sector in 2012 and 2013 but declining growth rates over the long run
- Rising field crop production despite a stagnation in the area under production (except for soybeans) due to significant intensification of production.
- Consistent intensification and expansion in meat, eggs and dairy production. Yet domestic production is unlikely to meet the growth rates of the past decade.
- Horticultural production will remain stable over the period, with growing export parity prices due to the weaker exchange rate.

The BFAP Baseline 2012 illustrates a 10-year outlook that can be summarized as a decade of consolidated area under production and faster growing productivity in field crop, horticulture and animal production. This outlook is generated under the assumption of a favourable outcome of land reform. In other words, in terms of grain production the growing demand in SA will most likely be met by intensification and not expansion. Hence, any land that changes ownership has to remain in productive use in order for baseline production forecasts to be met. However, there are industries that will not only intensify but also expand over the outlook, compared to the previous decade. These industries are soybeans, canola, chicken, eggs, beef, pork, sheep meat and dairy. Although the impact of mining in Mpumalanga was taken into consideration by accounting for land confirmed as lost to agriculture, there remains the possibility that further areas will come under prospecting. This could reduce the area under maize and soybeans in the later years of the outlook period even further. During the past 12 months, agricultural commodity markets experienced significant volatility as the balance between supply and demand tightened whilst markets were also significantly influenced by a wide range of exogenous forces. Apart from weather, stronger linkages between agricultural commodities and energy markets through inputs such as fuel and fertiliser, and through the demand for feedstock in the biofuels industry, has strengthened the transmission of volatility in energy markets to agricultural markets. This implies that world economic growth and volatility not only drives agricultural markets through food demand, but also through energy demand. In this regard, the latest projections by the OECD and IMF show a gradual decline in GDP growth rates for all major economies beyond 2013. These projections are based on the assumption that major developing economies such as India and China will attempt to curb inflation, which is likely to result in energy prices remaining at reasonable levels. Therefore, with declining economic growth rates and stable energy prices, the long-run outlook on world prices is at a higher plateau than the past decade, but relatively flat for most of the agricultural commodities.

Slower economic growth of the major global players will affect South African economic growth negatively and therefore in this year's Baseline the real per capita gross domestic product (GDP) is projected to peak at 4.2 % in 2016 and then gradually decline to just below 4 % by 2021. Oil prices are projected to decline from their current relatively stable band of US $110 to US $120 to approximately US $90/barrel by 2021. The Rand is projected to remain relatively strong and only a very gradual depreciation in the exchange rate is anticipated.

On the basis of a more cautious outlook of world economic growth over the next decade, the demand for food in general is expected to grow consistently mainly due to population growth, whilst in real terms world commodity prices are likely to remain fairly stagnant albeit at a higher plateau compared to the previous ten-year period from 2001 to 2011. The projected higher price plateau is not only supported by the growth in demand, but also by resource constraints, particularly those related to water and land. The costs, risks and barriers of breaking new land and producing on a sustainable but competitive basis globally are rising as production has to expand beyond the traditional well developed production areas.

The recovery of commodity prices in 2011 boosted the real gross income of the agricultural sector by 13 %. Thus, the real gross income for field crops is expected to increase by 6.3 % in 2012 and a further 13% in 2013. Beyond 2013, the growth rate will be stagnant as local prices in real terms are expected to remain flat. A projected growth in real disposable income, animal production and domestic prices are expected to spur the gross income of animal products to grow at an annual average growth rate of 3.5 % from 2013 to 2021.

In 2013, SA will reach its highest area under production of field crops since 2004 by expanding production by almost 300 000 ha on the back of increases in commodity prices that are expected to exceed the increase in input costs by a significant margin in the 2012/13 season. This is a drastic turnaround in the outlook for the SA field crop industries for the 2012/13 production season, since a decline in prices was actually anticipated in March and April 2012 when the US intentions to plant were released, which indicated that the US could produce an all-time record maize and soybean harvest on the back of the expanded acreage. However, as the grip of the drought on US maize yields deepened in June and July, the US market for maize and soybeans entered another strong bull run, dragging along most of the other grain and oilseed commodity markets in the world. At the time the Baseline projections on food prices were generated, the impact of the US drought was uncertain and based on annual average maize and wheat price projections, a year-on-year drop in the rate of inflation in prices of maize meal and bread was simulated. However, most recent indications of the US drought show that the impacts are severe and therefore, with much higher world and local maize and wheat prices, the outlook for local maize meal and bread prices will probably be exceeded by a significant margins.

The relative shift in staple food consumption away from maize into bread, pastas, potatoes and rice will continue, but at a much slower pace compared to the past decade, due to slower economic growth over the forecast period. The demand for potatoes and wheat-based products is projected to grow by 18 % and 20 % respectively, while the consumption of maize meal is projected to remain stagnant. The increase in the demand for beef over the next decade is expected to match that of the past decade, averaging an annual growth rate of 3 %. Although the consumption of chicken meat is projected to maintain a rapid growth rate of approximately 4 % per annum, it will not match the sharp rise of 70 % (i.e. average annual growth rate of 7%) that occurred during the past decade; the reason being a projected lower rate of increase in real per capita income for the period 2012 to 2021. Some 2.4 million tons of chicken meat will be consumed by 2021. Chicken meat production is anticipated to grow by 29 % from 1.4 million tons to 1.8 million tons over the next decade, implying that South Africa will remain a net importer of chicken meat. The production of eggs will expand by 29 % during the baseline period, which will be sufficient to meet the total demand for eggs of 530 000 tons by 2021. The negative trend in mutton production is likely to be converted to a positive trend over the outlook period as production is expected to increase due to profit margins exceeding those of grain farming. However, the expected turnaround in production is only likely to occur in areas where stock theft is limited, namely the Western and Northern Cape. The demand for fresh milk

and dairy products is expected to increase by 22 % and 34 % respectively during the baseline period.

The upward trend in area planted to table and dried grapes is projected to break in 2012 and to stagnate between 2012 and 2014, before increasing again from 2015 onwards to reach 22 436 ha in 2021. The export prices for table grapes are projected to follow an increasing trend in nominal terms with an average annual increase of 7 %. With a projected inflation rate of 6 % for the baseline period, table grape prices in real terms are projected to increase on average by only 1 % per year. The increase in real prices is driven by rising demand, especially in non-European markets, the slightly depreciating Rand against the Euro and Dollar, and also a stabilisation in southern hemisphere exports, which in turn creates market space for South African table grape exports to occur.

With current tight global stock-to-use levels, increasing input costs that limit the rapid expansion of production, significantly stronger linkages between agricultural commodities and energy prices, and potentially adverse weather conditions occurring at a higher frequency than in the past 10 years, it is likely that prices could be significantly higher than those presented in this year's Baseline. Although South Africa's export market for white maize to neighbouring countries has diminished considerably over the past two seasons due to maize surpluses produced in a number of countries in Africa, the sustainability of surplus production in southern Africa remains uncertain as government policies play a decisive role in providing incentives to small- and large-scale producers, and there are doubts about the fiscal sustainability of such support. Furthermore, SA has successfully exported large volumes of white maize to premium markets in Mexico and more recently Venezuela and possible China.

The impact of mining on agriculture in a pilot study area is described in the last section. A total of 79 967 ha of land that is currently under maize and soybean production will be taken over by mining activities within the next five to ten years. Without taking expected yield improvements into consideration, it is estimated that approximately 447 581 tons of maize and 49 889 tons of soybeans could be taken out of production from this area. Simulations in the BFAP sector model suggest that maize prices will increase by 9 % on average due to the loss of production in the pilot area. Over the short-run mining's contribution to the country's gross domestic product (GDP) exceeds the contribution of agriculture by a significant margin, yet over the long-run, agricultural production can be regarded as more sustainable. Therefore, the long-run impacts on food security and employment become even more important to understand. Food security has many elements, of which accessibility and affordability of food are the most critical drivers.

To conclude, the following 18 months will be a period of mixed fortunes for the various industries. Whereas field crop production is expected to expand by 300 000 ha in total and prices are currently at record levels, all livestock and dairy enterprises will come under a lot of strain at least over the next six to nine months until grain and oilseed prices a set to decline due to a major supply response under the assumption of normal weather. Local meat and dairy prices will improve as production is expected to be relatively stagnant on the back of high feed prices. Therefore, in 2013 both field crop and livestock industries are expected to grow.

The projected growth in the gross income from field crops and animal products is also expected to increase the real gross income of the agricultural sector by 6% in 2012. A further increase of 7% is expected in 2013. Yet, over the long run, growth rates will decline in real terms as agricultural commodity prices trade sideways under the assumption of a slowing down of the world economic growth rate, the expansion and intensification of agricultural practices and normal weather conditions.

Overview

REAL GROSS VALUE OF FIELD CROPS

AFTER CONSECUTIVELY DECLINING since its peak level in 2008, real gross income from field crops has considerably revived, and increased by 22 % in 2011. The recovery is mainly due to higher domestic prices, driven by the rise in the world commodity prices. Among the field crops, the nominal gross income more than doubled for sunflower seed and showed remarkable growth for barley (92 %) and soya beans (57 %). Gross income for maize and wheat also increased, by 23 % and 36 % respectively. Commodity prices in 2012 are expected to remain well above those of the previous year and due to the significant rise in world prices on the back of the current US drought conditions, local prices will remain high in 2013. Thus, the real gross income is expected to increase by 6.3 % in 2012 and a further 13% in 2013. Beyond 2013, the growth rate will be stagnant as local prices in real terms are expected to remain flat.

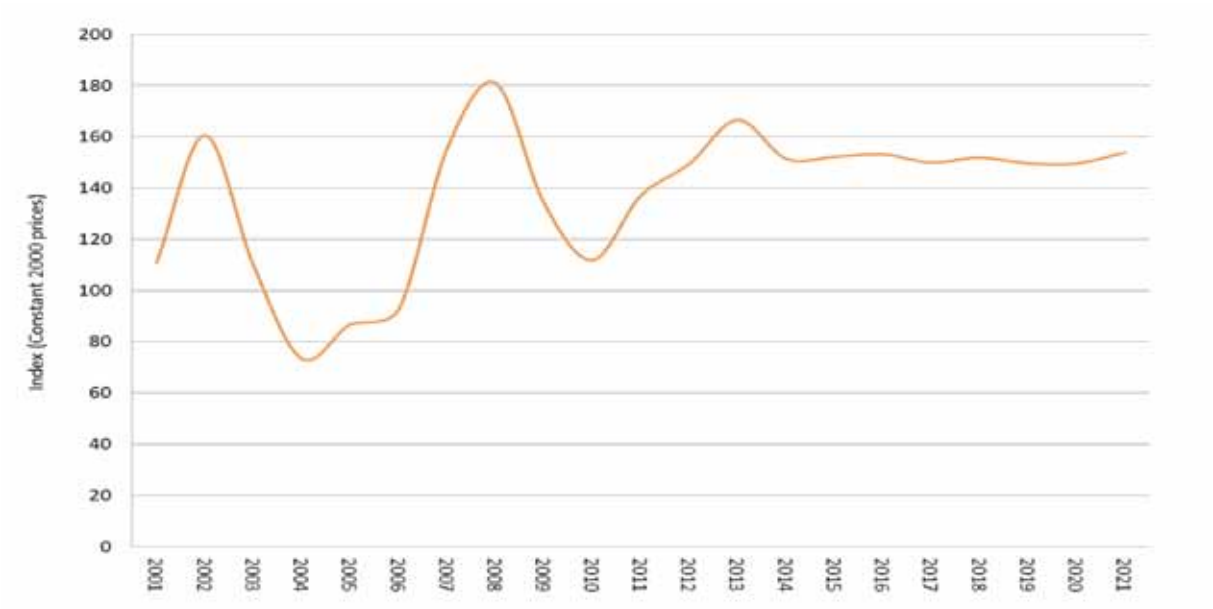


Figure 1: Real gross value of field crops

REAL GROSS VALUE OF ANIMAL PRODUCTS

REAL GROSS VALUE OF ANIMAL PRODUCTS

Real gross income from animal products increased by 3 % in 2011, after remaining relatively stagnant in 2010. Nominal income from cattle and calves slaughtered increased by an impressive 17 % followed by sheep, goats and pigs slaughtered, which all showed a similar growth rate of 11 % in 2011. There was, however, a decline in gross income from milk production and a modest increase from poultry (5 %) and egg (3 %) production. The real income from animal products is expected to increase by 6 % in 2012 as a result of increased production and higher prices in real terms. The projected growth in real disposable income, animal production and domestic prices are expected to spur the gross income of animal products to grow at an annual average rate of 3.5 % from 2013 to 2021.

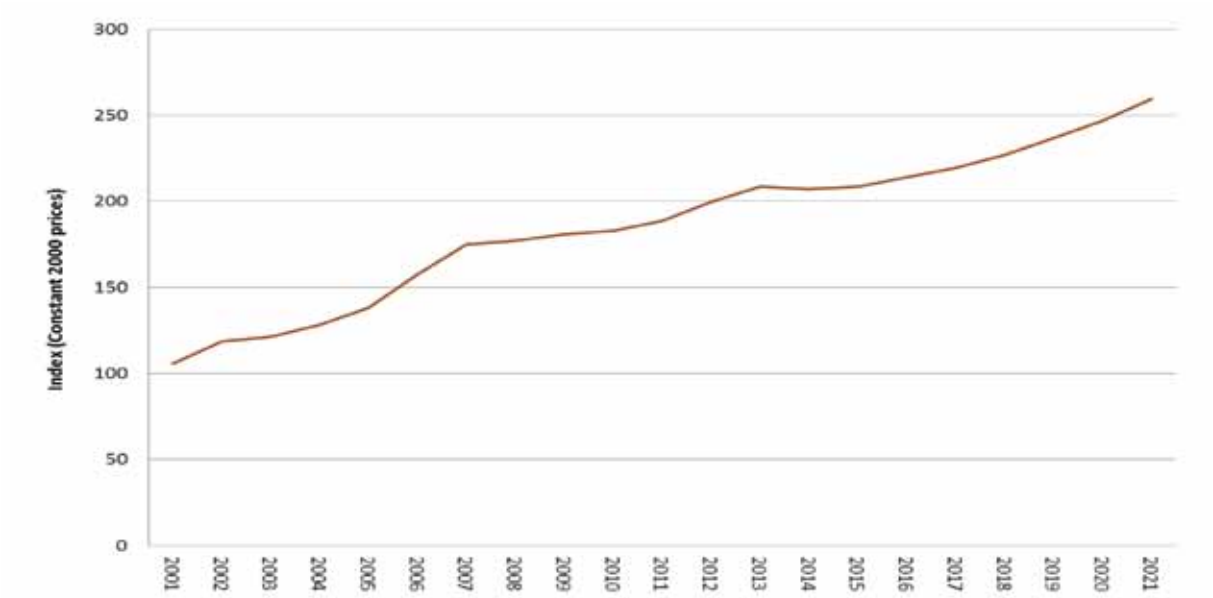


Figure 2: Real gross value of animal products

REAL GROSS INCOME OF TABLE GRAPES, APPLES AND PEARS

THE REAL GROSS income of table grapes, apples and pears decreased by 1.4 % in 2011. This was due to the fall in real gross income from table grapes and pears by 8 % and 4 % respectively. Real gross income from apples, however, showed a 9.8 % increase during the same period. In 2012, the real gross income from the three fruits is expected to grow by 3 % as a result of a further growth of gross income from apples. During the baseline period, a 1.4 % average annual growth rate is projected. The modest growth rate is mainly due to the projected marginal growth rate of pears compared to the other two fruits.

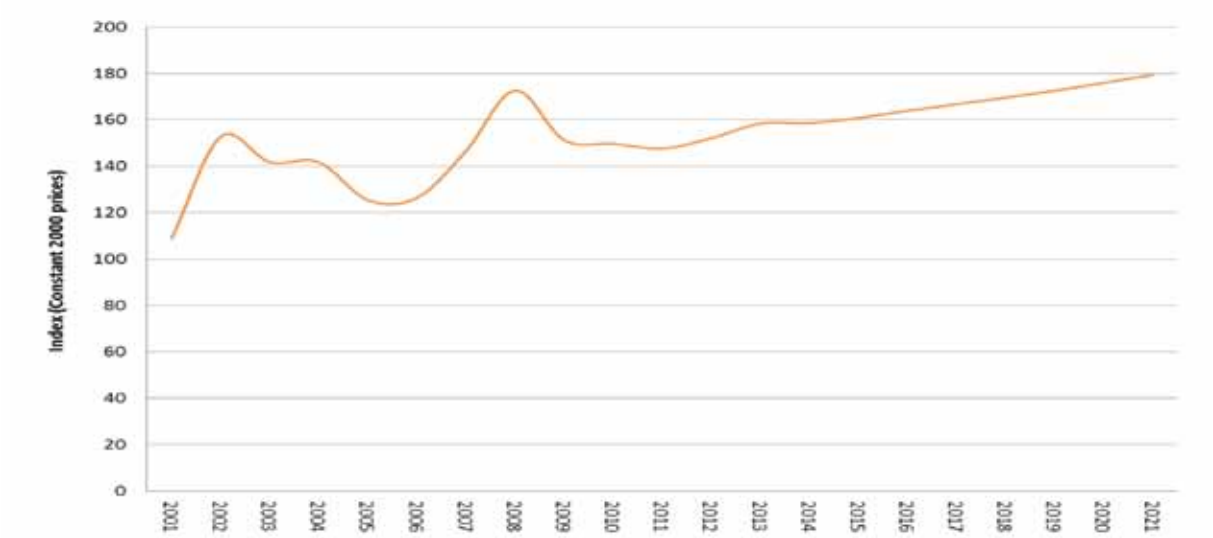


Figure 3: Real gross income of table grapes, apples and pears

REAL GROSS INCOME OF THE AGRICULTURAL SECTOR

THE RECOVERY OF commodity prices in 2011 boosted the real gross income of the agricultural sector by 13 %. In nominal terms, gross income from field crops, animal products and horticulture increased by 28.6 %, 8.3 % and 6 % respectively in 2011. Thus, the substantial growth of income from field crops due to higher commodity prices contributed most to the growth in the gross income of the sector. The projected growth in the gross income from field crops and animal products is also expected to increase the real gross income of the agricultural sector by 6% in 2012, with a further increase of 7% expected in 2013. From 2014 onwards, a 1.4 % annual average growth rate is projected, with an initial decline in 2014, followed by a recovery and gradual increase in the real gross income over the baseline period.

Figure 4: Real gross income of the agricultural sector

REAL INTERMEDIATE INPUT EXPENDITURE

REAL INTERMEDIATE INPUT expenditure refers to all purchased inputs used during the production season. Among these expenditures are fuel, fertiliser, feed, farm services, and maintenance and repairs. Real intermediate input expenditure increased by 4 % in 2011. This growth is mainly due to a higher nominal growth rate of maintenance and repairs expenditure (16 %), followed by farm service expenditure (15 %). Fuel, feed and fertilised expenditure also rose by 6 %, 8 % and 9 % during the same period. The projected increase in area under production and input prices is also expected to further increase real intermediate input expenditures by 4.3 % in 2012. Key drivers of intermediate input expenditure are the oil price and the exchange rate and, under the assumption of stagnant and even slightly declining oil prices over the long run, the average growth rate in intermediate input expenditure is expected to decline to an annual average growth rate of 2.2% between 2013 and 2021.

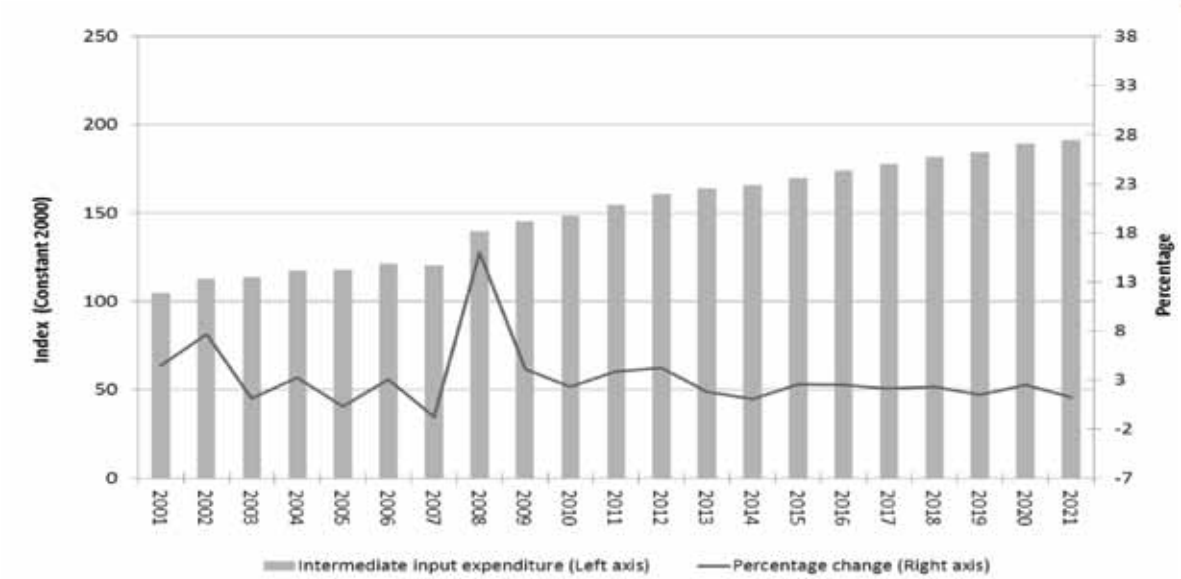


Figure 5: Real intermediate input expenditure

REAL GROSS VALUE ADDED OF AGRICULTURAL SECTOR

THE AGRICULTURAL SECTOR'S contribution to the economy is measured in terms of the real gross value added (agricultural GDP). It is computed as the difference between the gross income (including own construction and changes in livestock inventory) and intermediate input expenditure. The remarkable growth of agricultural income in 2011 propelled the growth of real value added of the sector by 10.4 %. A projected growth of gross income of the sector is also expected to further spur the growth of real value added by 8 % in 2012 and 12% in 2013. Gross income of the sector during the baseline period is projected to spur a 2.4 % annual average growth rate of real gross value added from 2013 to 2021. It is, however, important to note that this positive growth rate is the average of a declining growth rate during the medium term (2014-2017) which is eventually outweighed by a strong positive growth rate in the outlying years of the baseline.

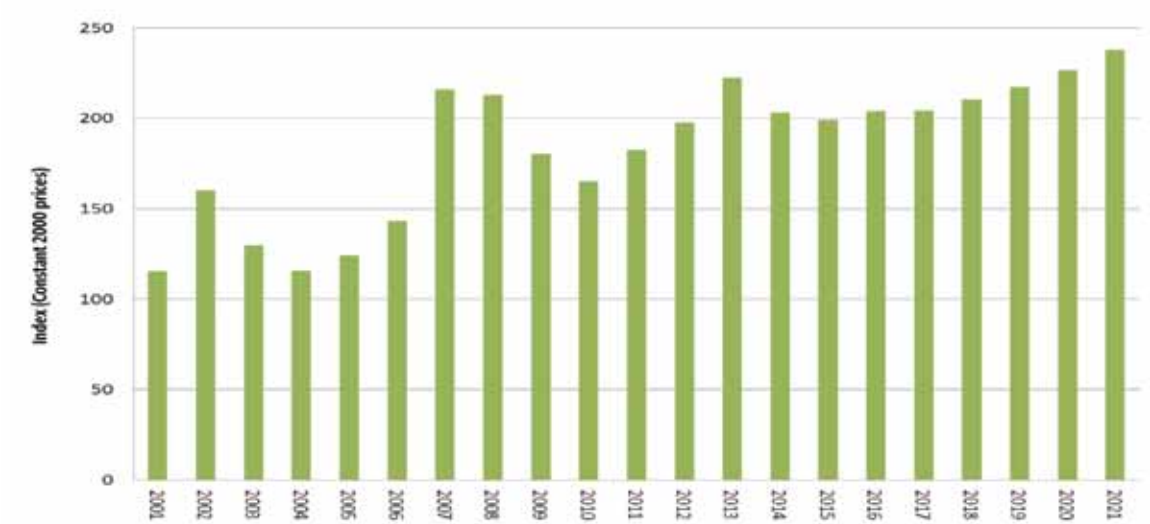


Figure 6: Real gross value added of the agricultural sector

REAL NET FARMING INCOME

NET FARMING INCOME shows the producer's income remaining after paying for rent, interest, labour remuneration and an allowance for depreciation. The decline of net farming income since the peak level of 2008 was reversed in 2011, registering a substantial growth of 17 % as a result of a significant growth in gross income compared to input expenditures. The projected higher growth in gross income compared to input expenditures is projected to increase net farming income by 10 % in 2012. During the baseline projection period, real net farming income is expected to show a considerable growth in 2013 due to the projected higher commodity prices. For the remaining baseline period, however, it is projected to remain flat over the medium term and increase towards the end of the baseline as the growth in commodity prices is expected to outpace the rise in input expenditure.

Figure 7: Real net farming income

REAL AGRICULTURAL DEBT

THE REAL AGRICULTURAL debt increased by 8 % in 2010, following the substantial rise in gross capital formation of tractors, machinery and implements, which grew by 26 % in 2011. Most of the growth in debt during 2011 was acquired from the Land Bank, whose nominal debt level to the sector grew by 37 %. The debt from commercial banks grew by only 8 % in 2011. The total agricultural debt, however, is still dominated by commercial banks, whose share accounts for 57.7 % compared to the Land Bank (24.9 %) and Cooperatives (10 %). During the baseline period, it is projected to increase by a 2 % annual average growth rate, due to a projected growth in gross capital formation. Thus, the debt burden (which is the percentage of the total debt to the total asset value) is expected to remain below 32 % during the baseline period.

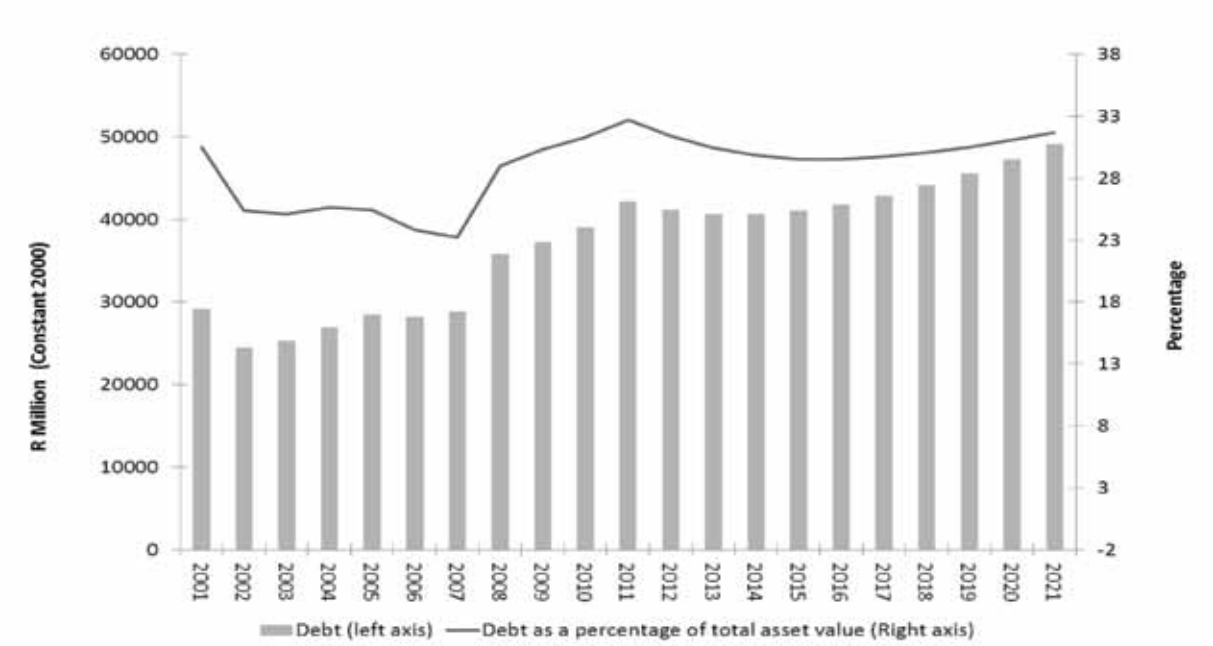


Figure 8: Real agricultural debt

KEY BASELINE ASSUMPTIONS

POLICIES

The baseline assumes that current international as well as domestic agricultural policies will be maintained. In a global setting, this assumes that all countries adhere to their bilateral and multilateral trade obligations, including their WTO commitments. On the domestic front, current policies are maintained. With the deregulation of agricultural markets in the mid-nineties, all the non-tariff trade barriers and most direct 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 US $157/ton to US $215/ton. Following the recent sharp increase in world price levels, the industry submitted a request for a further increase in the reference price, but the results of this submission are not yet known.

Current levels of world prices for both maize and wheat are significantly higher than the reference prices, thus the duty on imported wheat and maize is zero. 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. The projected tariff levels, as derived from the FAPRI projections of world commodity prices, are presented in the

Table 1: Key policy assumptions

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
						R/ton					
Maize tariff: (Ref. price = US$ 110)	0	0	0	0	0	0	0	0	0	0	0
Wheat tariff (Ref price = US$ 215)	0	0	0	0	0	0	0	0	0	0	0
Sunflower seed tariff: 9.4 % of fob	404	389	447	365	370	378	392	408	426	441	451
Sunflower cake tariff: 6.6 % of fob	89	98	111	81	86	90	96	102	109	115	118
Sorghum tariff: 3 % of fob	57	66	61	59	61	62	64	64	65	66	67
Soybean tariff: 8 % of fob	279	301	346	282	286	292	303	316	330	342	349
Soybean cake tariff: 6.6 % of fob	166	192	214	164	172	181	190	200	211	221	228
						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
						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)	735	885	970	975	962	964	970	991	1036	1087	1142
Lamb tariff: max(40 %* fob,200c/kg)	1295	1196	1310	1316	1300	1302	1310	1339	1399	1468	1542
Chicken tariff: 220c/kg	220	220	220	220	220	221	222	223	224	225	225
Pork tariff: max(15 %* fob, 130c/kg)	159	159	180	171	168	175	183	191	195	198	202

IN THE CASE OF biofuels, the South African government published its industrial strategy on biofuels in December 2007. This strategy has been incorporated into the model by taking the relevant tax rebates into consideration. The current level of biofuel production from agricultural commodities is negligible. It is possible that by the time this Baseline is published, government will have announced a 2 % mandatory blending rate. The details of when and how this mandatory blending rate will be introduced are, however, uncertain. In terms of renewable energy, an alternative of co-generation is also incorporated in the chapter presenting the sugar outlook. Policies regarding renewable fuels and energy are still being debated and have not been implemented.

MACRO-ECONOMIC ASSUMPTIONS

THE BASELINE SIMULATIONS are largely 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 Global Insight.

Table 2: Key macro-economic assumptions

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
						Millions					
Total population of SA	50.46	50.74	50.98	51.21	51.43	51.66	51.88	52.11	52.34	52.57	52.81
US $/barrel											
U.S. refiners acquisition oil	111.40	110.20	103.94	108.25	106.05	104.94	102.22	97.61	92.93	88.25	89.74
						SA cents/Foreign currency					
Exchange rate (SA cents/US$)	726	804	822	848	876	902	928	954	981	1009	1037
Exchange rate (SA cents/Euro)	1014	1025	1044	1075	1108	1140	1173	1207	1242	1278	1315
						Percentage change					
Real GDP per capita	3.07	2.70	3.40	3.62	3.82	4.20	4.14	3.89	3.86	4.02	3.96
GDP deflator	6.70	6.20	6.00	5.90	5.60	5.30	5.00	4.80	4.50	4.30	4.20
						Percentage					
Weighted prime interest rate	9.48	9.55	9.61	9.67	9.74	9.80	9.86	9.93	9.99	10.05	10.12

BFAP BASELINE AGRICULTURAL OUTLOOK

summer grains

GLOBAL MAIZE SITUATION AND TRENDS

IN JULY 2012 THE USDA's World Agricultural Outlook Board released its projections for the US summer crops, forecasting major downward adjustments in yields. General market expectations that the 2012 US maize and soybean crop would replenish world stock levels significantly on the back of expanded acreage are being crushed by the impact of the severe drought in the main production regions in the US. The US is responsible for 50% of world exports of maize. Whereas all indications were that market prices would decline towards the end of 2012, prices are now spiralling, and the world price for maize has become a moving target. This comes just after maize prices had reached record highs in 2011.

World maize stocks are therefore foreseen to remain low in 2012, which will keep season average world prices at higher levels. Under the assumption of normal weather conditions in key maize-producing countries during 2013, world production will outstrip use in 2013 and will allow some stock rebuilding. World prices are projected to decline in 2013 as supply fears subside. Maize planting is forecasted to increase over time in countries such as Brazil, Europe and the former Soviet Union countries and, yields are expected to grow as a result of improved technology These combined influences result in a projected growth in output that is slightly faster than the growth in demand in the long run. The improved stock outlook, together with lower future prices of crude oil, are expected to moderate world maize prices towards the end of the baseline period (Figure 9). Nonetheless, stock levels remain tight and markets will be sensitive to any news affecting world maize supply and demand.

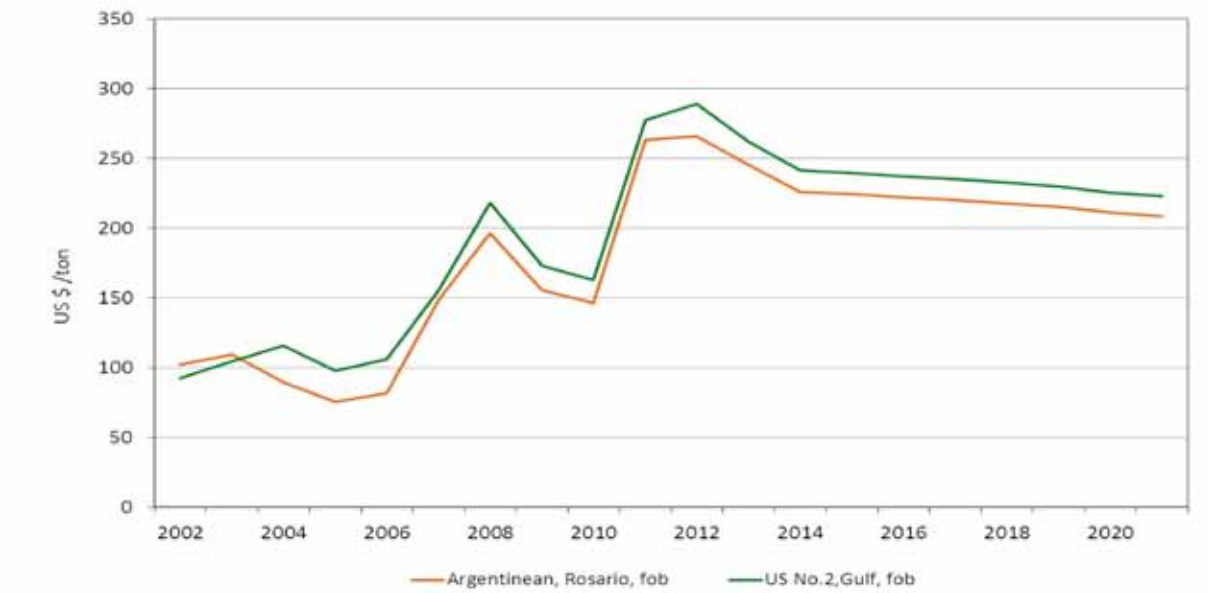


Figure 9: Yellow maize world prices
Source: FAPRI & BFAP

DOMESTIC SUMMER GRAIN SITUATION AND TRENDS

HIGHER INTERNATIONAL PRICES and lower domestic stock levels have led to significant increases in domestic maize prices at the time farmers had to make their planting decision for the 2011/12 production season. Following the higher prices, South African producers increased maize plantings from 2.37 million hectares in 2011 to 2.7 million hectares in 2012. White maize plantings increased by 15 % to 1.64 million hectares while yellow maize plantings increased by 11 % to 1.06 million hectares. However, this increase came partially at the expense of sorghum since sorghum plantings declined by a further 30 % to less than 49 000 hectares in 2012, following a 20 % decline in 2011 (Figure 10).

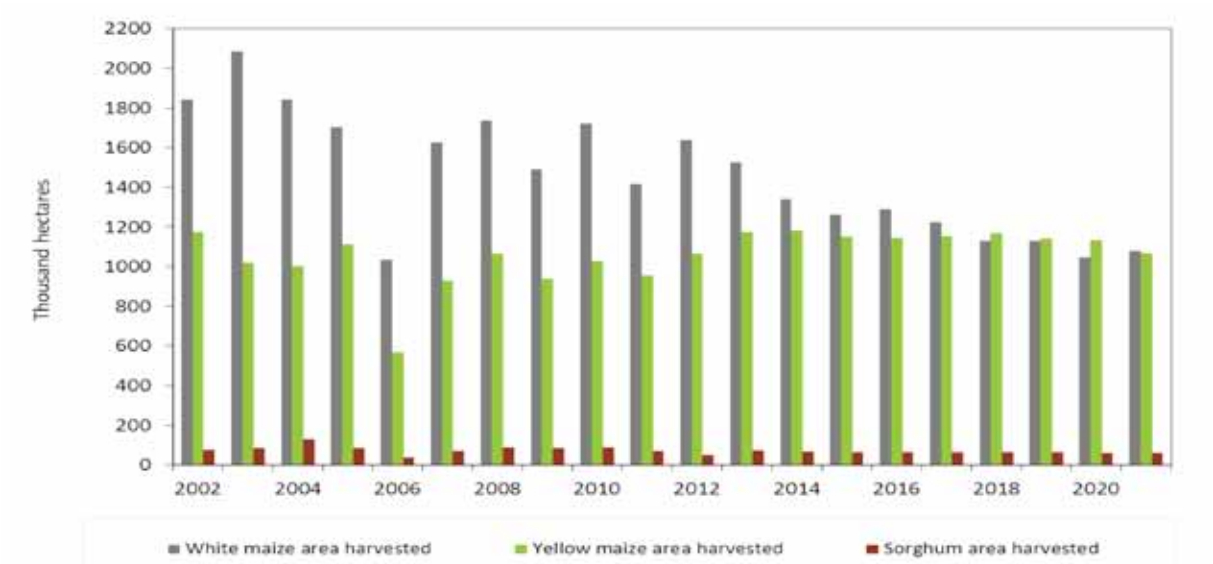


Figure 10: Summer grain area harvested

THE OVERSUPPLY SITUATION DURING harvesting time in 2011 led to a situation where local maize prices even traded below export parity for some time. This created an opportunity for traders to lock in profitable deep sea export business to countries such as Mexico in advance. The higher exports, together with a smaller than initially anticipated 2012 maize crop eventually paved the way for a significant reduction in projected 2012 ending stocks after the completion of the 2012 harvest. By the end of the 2011 season, ending stocks were below the pipeline requirement. White and yellow maize spot prices spiralled, but the July 2012 future contract price remained relative stable around R2000/ton as the market was expecting a decent sized crop. The ending stocks at the end of the 2012 season will depend on the level of exports over the next six months. One important fact is that local prices have not yet traded below export parity prices as was the case in 2011. However, even with sufficient ending stock levels, average 2012 local maize prices are projected to be higher than the 2011 averages as world prices are significantly higher (Figures 11 and 12).

White maize plantings are projected to decrease by 109 000 hectares, but yellow maize plantings will increase by 110 000 hectares, bringing the total maize planting in 2013 to the same level as 2012. In the medium term, yellow maize plantings are expected to increase at the expense of white maize as feed demand is projected to grow while the demand for maize as food is projected to stagnate (Figures 10 and 13). However, total maize acreage will decline over the baseline period as producers switch to oilseeds while the continuing expansion of mining activities in important maize growing areas such as Mpumalanga will add to acreage losses. Despite the lower total maize plantings, total production is projected to remain at around 12 million tons, as yields are projected to increase by approximately 2 % per year if normal weather prevails. Under this assumption, the national average yield for the white and yellow maize crop in 2021 will be 5.3t/ha and 5.7t/ha respectively. South Africa will remain a net exporter of white maize but may have to import yellow maize by the end of the forecasting period as the growth in demand for yellow maize is projected to outpace the growth in production (Figures 11 and 12).

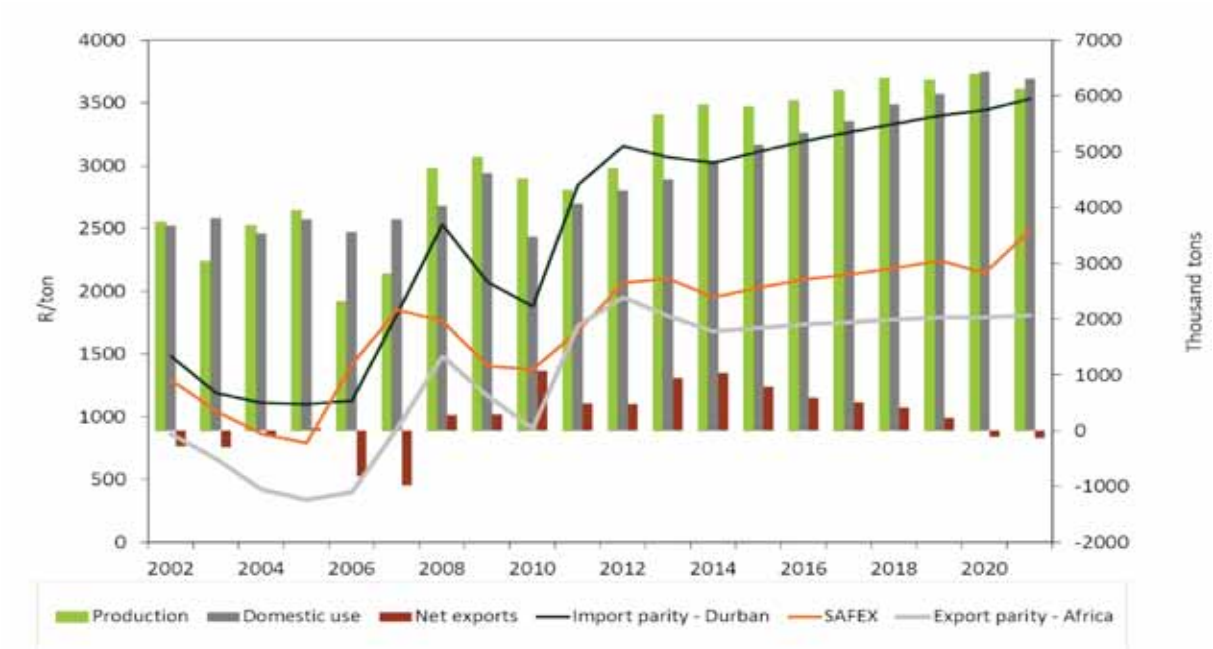


Figure 11: White maize production, domestic use, net trade and prices

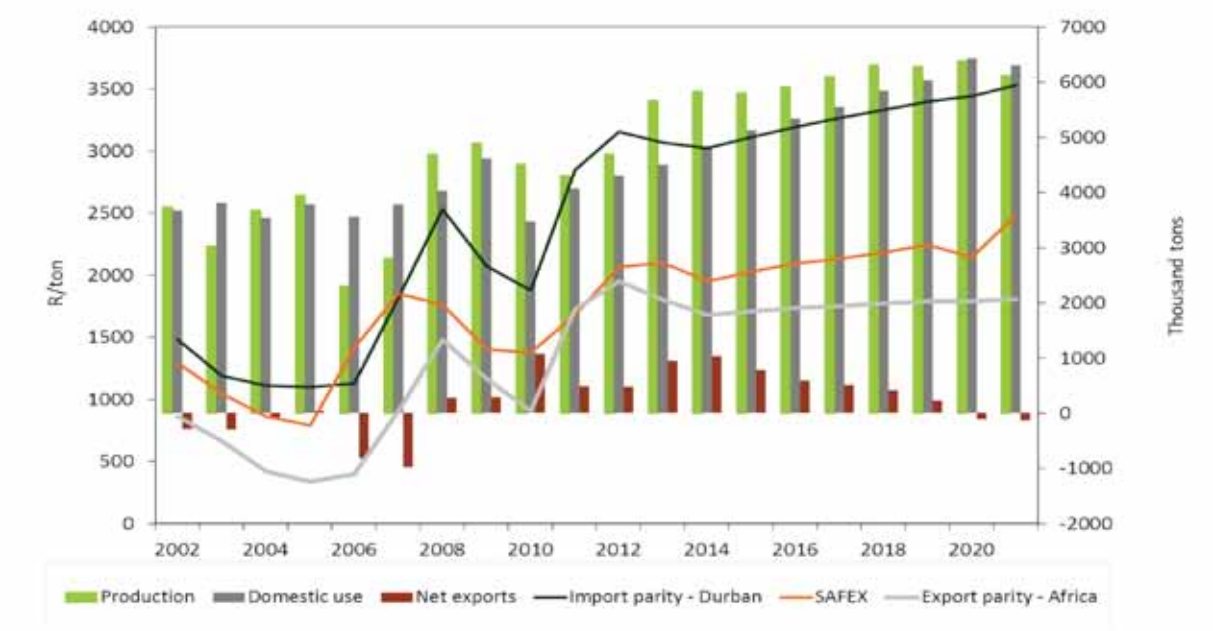


Figure 12: Yellow maize production, domestic use, net trade and prices

HENCE, UNDER THE BASELINE, the SAFEX white and yellow maize prices are expected to ease away from export parity levels and trade between import and export parity. Due to the lower projected hectares, price volatility is anticipated to increase as the switch between surpluses and shortages will occur quicker.

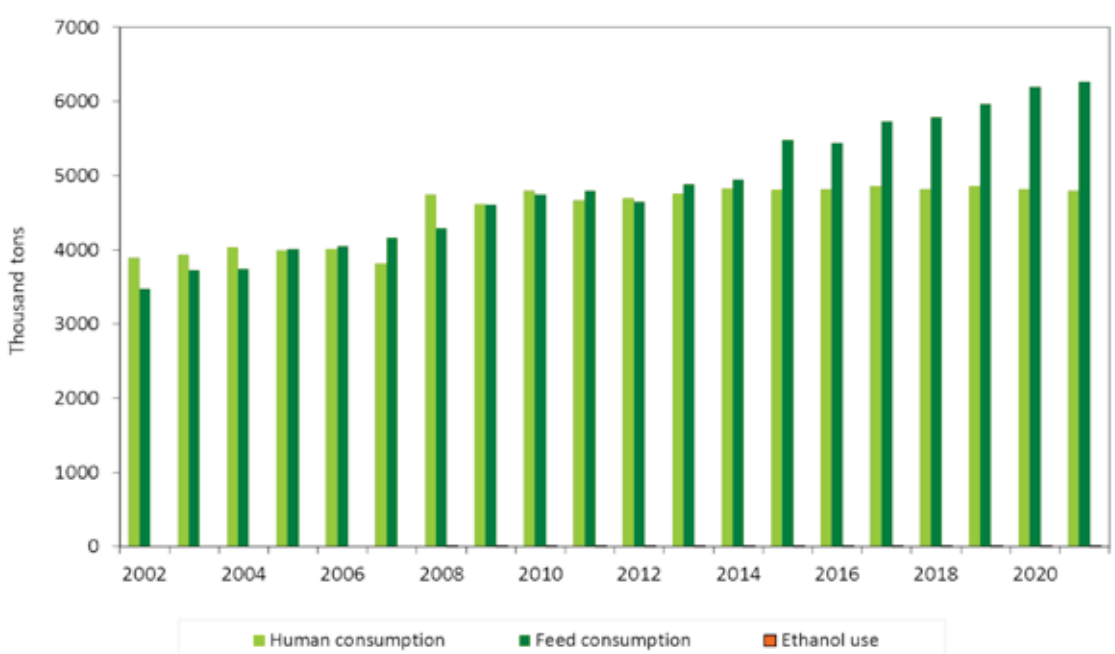


Figure 13: Total maize domestic consumption

DOMESTIC SORGHUM SITUATION AND TRENDS

OVER THE PAST DECADE, sorghum plantings made up only 3 % of total summer grain plantings in South Africa and can be regarded as a secondary summer grain crop after maize. After a 20 % decrease in sorghum plantings during 2011, sorghum producers planted a further 30 % less in 2012 despite higher prices. The lower plantings eventually resulted in South Africa being a net importer of sorghum since 2011 (Figure 14). Due to the local short supply, the producer price of sorghum is forecast to be 47 % higher in 2012 compared to 2011. The higher projected price will most likely provide a stimulus for higher sorghum plantings in 2013 and if normal weather prevails, local supply will be sufficient to meet the demand. This will lead to a lower price in 2013 and 2014. However, over the rest of the baseline, domestic use is projected to be slightly higher than production, which results in a projected net importing situation during the remainder of the forecasting period (Figure 14).

From an economic perspective, sorghum has been losing ground compared to maize, and a drastic turnaround is required in breeding programmes to improve the competitiveness of sorghum relative to maize, even in marginal production regions. Whereas average yields of yellow maize have improved by 5 % on average per annum, sorghum yields have only improved by 3 % per annum. The introduction of new, drought resistant maize varieties will in future years increase the competitiveness of maize even more in marginal production areas. Under current production parameters, sorghum has to trade at a significant price premium to ensure that some plantings do occur. Over the baseline, this is anticipated to be the case, with sorghum trading closer to import parity levels and therefore at a premium of approximately 30 % above maize prices.

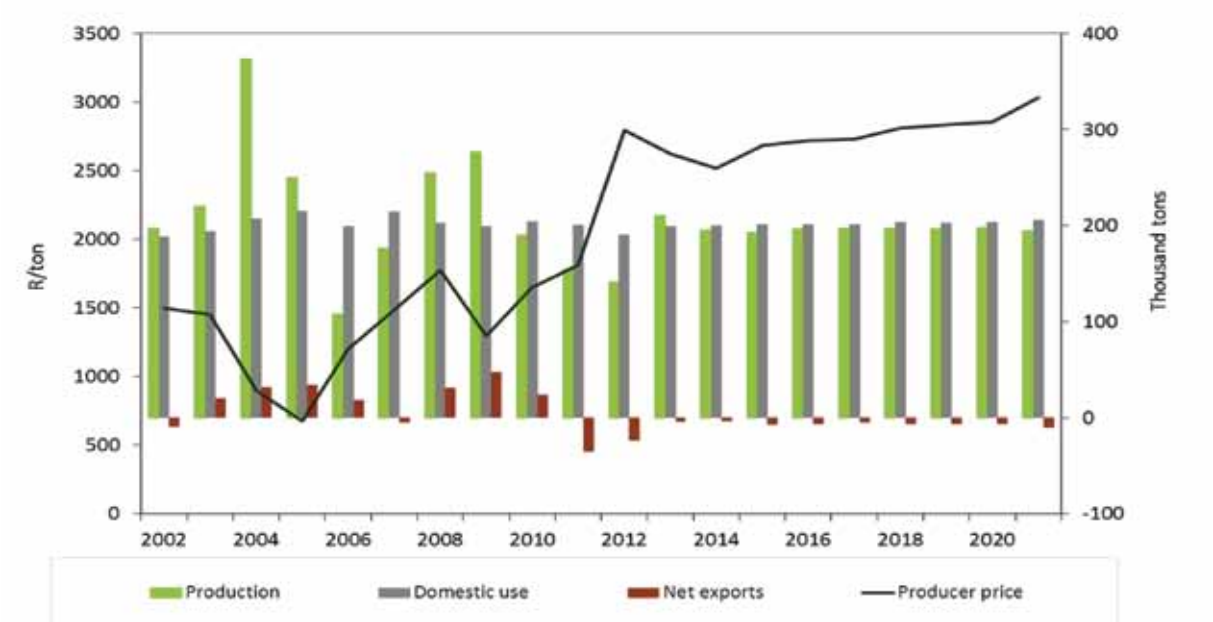


Figure 14: Sorghum production, domestic use, net trade and prices

IN RECENT MONTHS THERE have been renewed debates regarding the possible implementation of a mandatory blending level (possibly 2%) for bioethanol. Given the fact that maize has been excluded from the list of possible feedstock, the focus seems to be on sorghum and possibly sugar beet. If a mandatory blending rate is actually announced, it could, depending on the terms of implementation, have far reaching implications for the outlook of the sorghum industry. However, prices are at import parity levels and will most likely stay there, unless significant progress in made in breeding programs to improve yields and the impact of bird damaged is marginalised by growing bitter sorghum varieties that can be planted for the use of ethanol production instead of sweat sorghum for the human consumption market.

BFAP BASELINE AGRICULTURAL OUTLOOK

winter grains

GLOBAL CEREAL SITUATION AND TRENDS

IN CONTRAST WITH MAIZE, the world wheat stocks-to-use ratio is at much higher levels compared to a few years ago. Notwithstanding ample supply, global wheat prices increased by more than 30 % in 2011 and are projected to strengthen further in 2012 as grain markets in general responded to the tight maize stock situation. With an improved world feed grain outlook and global wheat yields matching long term trends, world wheat prices are projected to decline in 2013 before they consolidate and then drift lower towards the end of the baseline period in line with international feed grain prices (Figure 15). Despite the projected decline, prices are expected to remain above pre-2007 averages.

Overall global per capita consumption of wheat is projected to decline slightly over the coming decade, while growth in consumption is concentrated in developing countries where income and population gains drive increases in demand. Wheat remains the main feedstock used to produce ethanol in the EU in the near future but it is projected that the feedstock will shift to maize to support further expansion in ethanol production in the long run. With regard to global wheat trade, Russia, Ukraine and Kazakhstan's share in global wheat exports is forecasted to increase over the projection period, mainly at the expense of the US, Canada and Australia. However, year to year volatility in production and trade is likely during the period because of the Black Sea region's highly variable weather and yields.

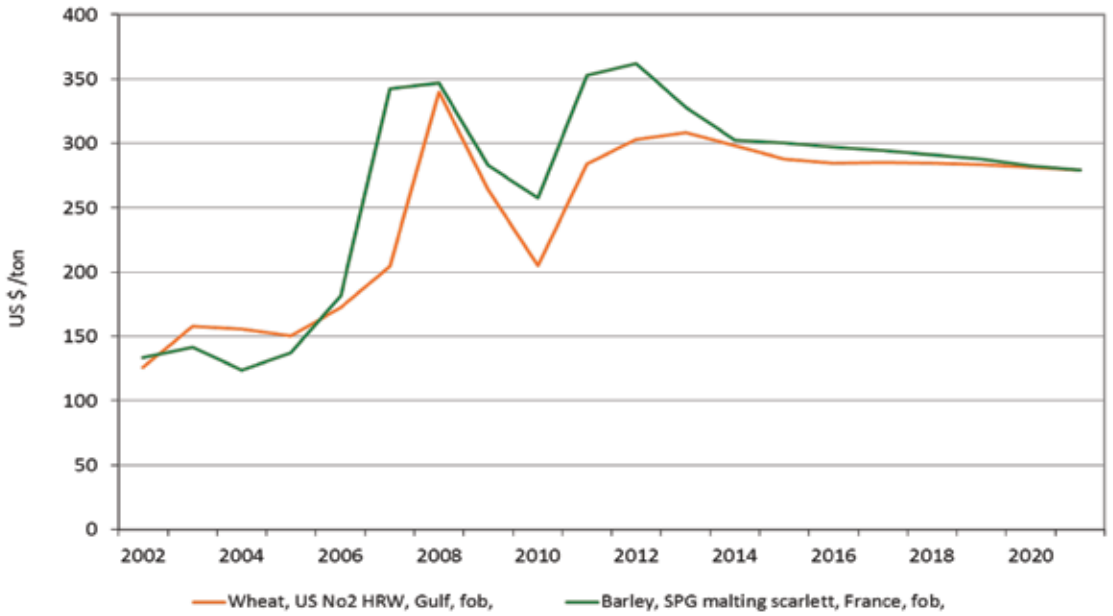


Figure 15: World winter grain prices
Source: FAPRI & BFAP

DOMESTIC WINTER GRAIN SITUATION AND TRENDS

SOUTH AFRICAN WHEAT PRODUCERS planted a total of 605 000 hectares of wheat during 2011, which was 8 % more compared to 2010 due to an increase in wheat plantings in the summer rainfall area (Figure 16). The higher acreage together with above trend yields resulted in a 33 % increase in local wheat production and fewer imports were needed to bridge the supply gap in 2011 (Figure 17). Despite the higher 2011 wheat price and good yields, producers in the summer rainfall area are expected to decrease plantings by 17 % in 2012 because of the higher 2012 maize plantings and less favourable soil moisture conditions at the onset of the 2012 wheat planting season. It is projected that producers in the winter rainfall area will keep wheat plantings unchanged from 2011 during the new season. Although no significant increases in wheat plantings are projected over the baseline period, local wheat plantings are not projected to continue the declining trend of the previous decade. Based on the assumption of normal weather, total wheat plantings are forecast to consolidate just above 600 000 hectares over the baseline period (Figure 16).

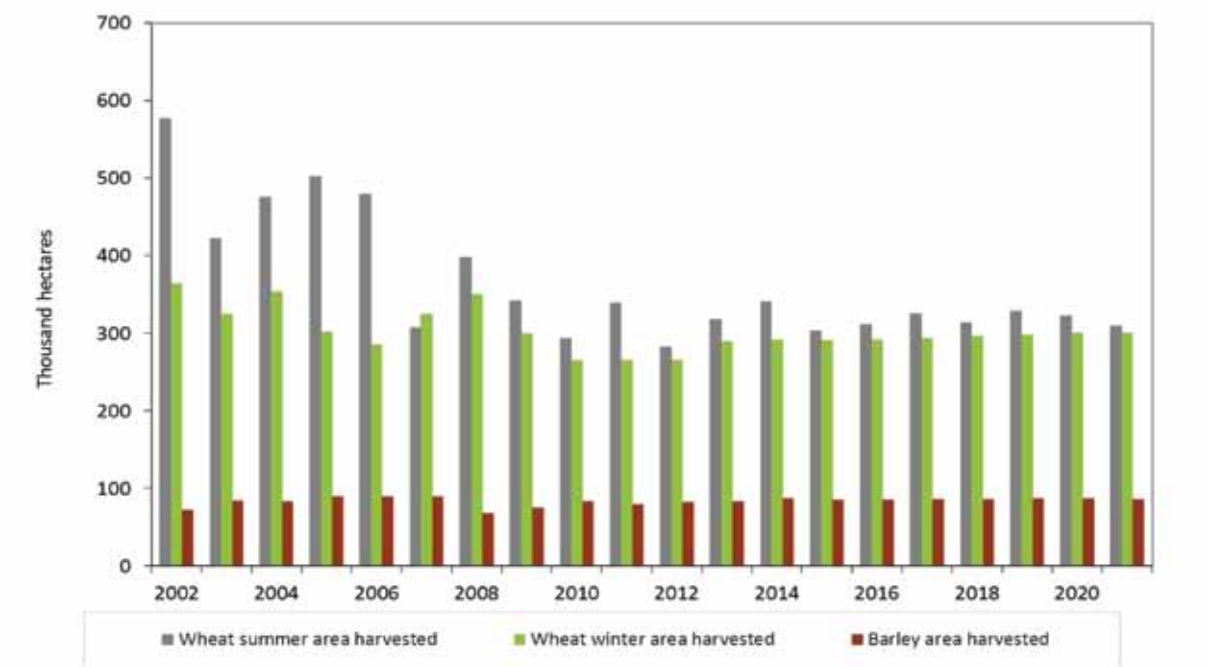


Figure 16: Winter grain area harvested

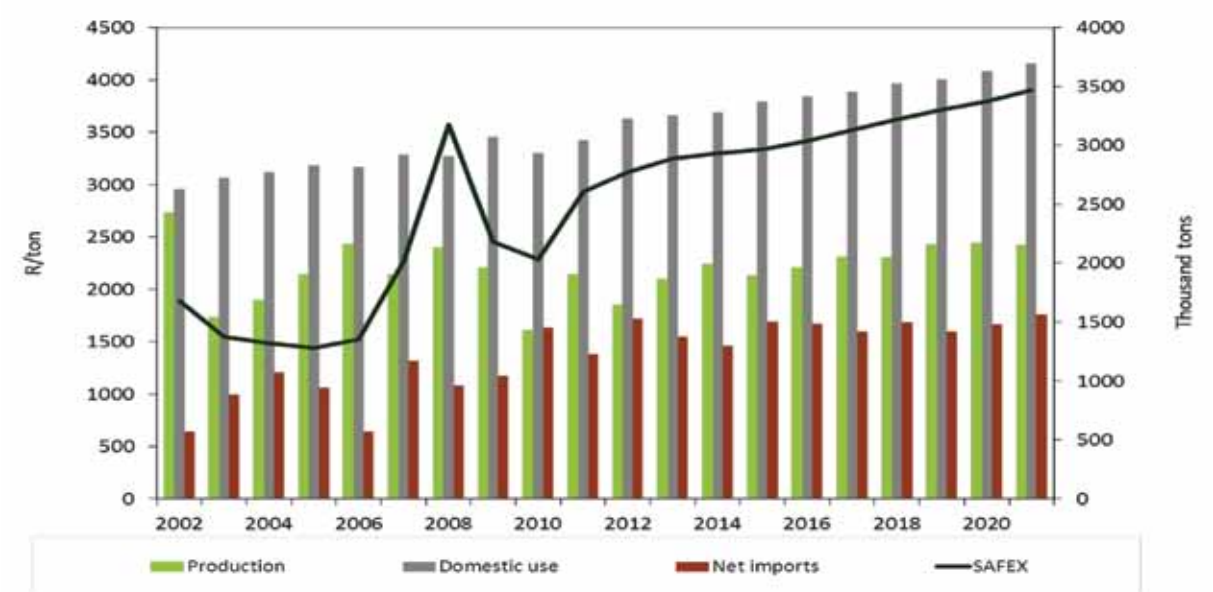


Figure 17: Wheat production, consumption, trade and price

LOCAL WHEAT CONSUMPTION IS projected to increase by 2 % per year over the next decade due to a growth in population as well as an increase in per capita consumption. With no significant changes projected in wheat plantings, the demand growth will have to be supplied by improved yields and an increase in imports (Figure 17). As South Africa remains a net importer of wheat over the baseline period, the local price trend will be dictated by the international wheat price and exchange rate fluctuations. The SAFEX wheat price is projected to increase in 2012 and 2013. From 2014 onwards, the forecast depreciation of the exchange rate is expected to more than compensate for the projected lower international prices, leading to an increase in local wheat prices towards the end of the baseline period (Figure 17).

DOMESTIC BARLEY SITUATION AND TRENDS

IN THE CONTEXT OF total winter grain, barley might be regarded as a small crop but as local barley production takes place mainly in two areas, namely the Southern Cape and Northern Cape, barley is an important crop from a regional point of view. In 2011, producers planted 3 % less barley compared to 2010 but production jumped 59 % as producers obtained record yields. The high yields together with favourable prices resulted in producers realising a significant increase in gross income per hectare. Plant breeders argue that the average yield for the dryland crop in 2011 of more than 3.5t/ha was exceptional and that long run trend yields will be lower under normal climatic conditions. However, the introduction of two new varieties in the dryland area has boosted the potential for yield improvements significantly. It is also expected that the average long run yields of barley will marginally exceed those of wheat in the dryland production regions. Furthermore, the new varieties have the potential of being classified as high fermentable malt (traditionally know as type-A). This type of malting barley is imported to supplement the specific requirements for local beer types, yet if the local production of high fermentable malt is increased, imports are likely to decline over time. Under the baseline projections, imports of malting barley decline as the rate of increase in local production, especially the production of high fermentable malting barley, marginally exceeds the growth in local demand.

Producers are projected to increase plantings by 3 % in 2012. The local barley acreage is expected to remain relatively stable at around 86 000 hectares, while production will increase as a result of higher yields over the baseline period (Figure 16 and 18). The 2012 barley price is projected to come in higher at around R2810/ton and over the period of the outlook, prices will increase on the back of a weaker exchange rate despite lower trending world prices. Similar to the world market where malting barley is trading at a small premium above wheat, the local malting barley price in Randfontein (derived from the Caledon price in the BFAP model) will trade slightly above the SAFEX wheat price (Randfontein) over the outlook. Together with higher trend yields, barley producers are therefore expected to achieve a premium income per hectare above wheat producers for the additional amount of production and management risk that barley requires above wheat production due to the technical requirements for producing a high quality malting barley.

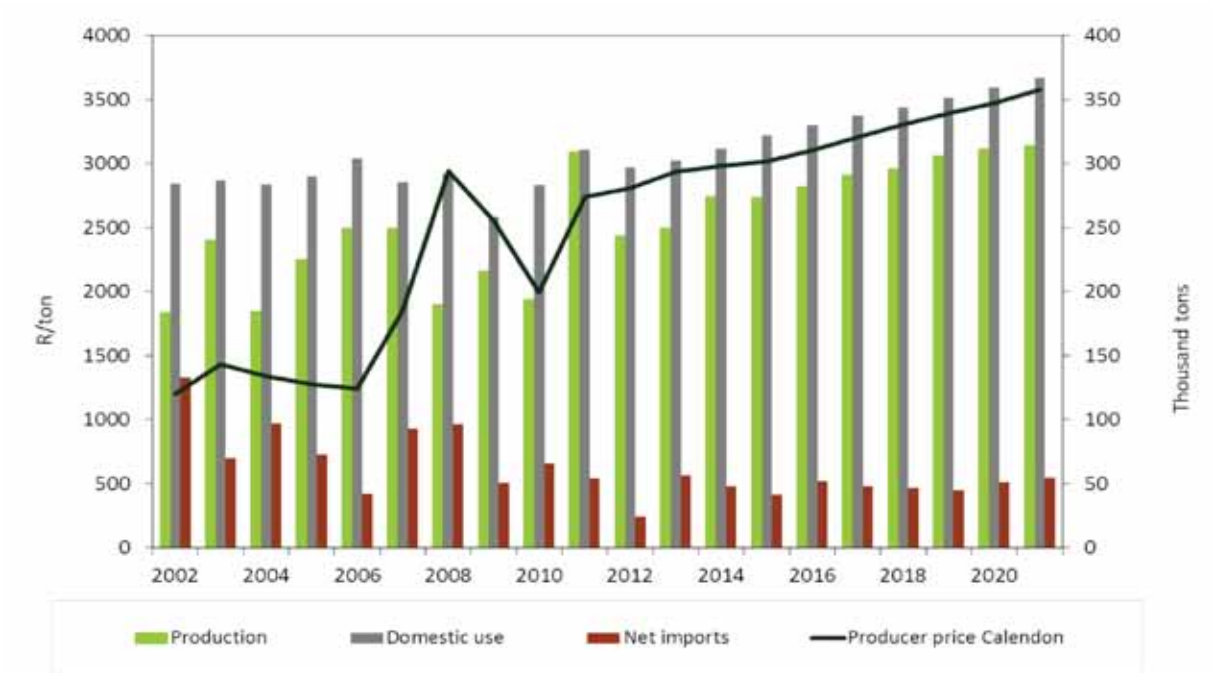


Figure 18: Barley production, consumption, trade and producer price

BFAP BASELINE AGRICULTURAL OUTLOOK

oilseeds & oilseed products

GLOBAL OILSEED SITUATION AND TRENDS

THE TIGHTENING OF WORLD oilseed stocks during 2011, in particular due to severe soybean losses in South America, pushed world oilseed prices higher in the past season (Figure 19). Similar to maize, the world market was anticipating that world stocks would be replenished by the expansion in soybean acreage in the US. However, the current drought has a detrimental impact on soybean yields and prices are spiralling as the crop estimates are lowered. Oilseed prices are expected to remain at record levels through 2012 and the first half of 2013, after which prices are forecasted to decrease gradually over the rest of the baseline period, corresponding to lower feed grain and crude oil prices. Soybean imports by China and exports by South America and the US are expected to continue dominating the world oilseed trade and are projected to rise over the next decade; although at a slower pace than in recent years.

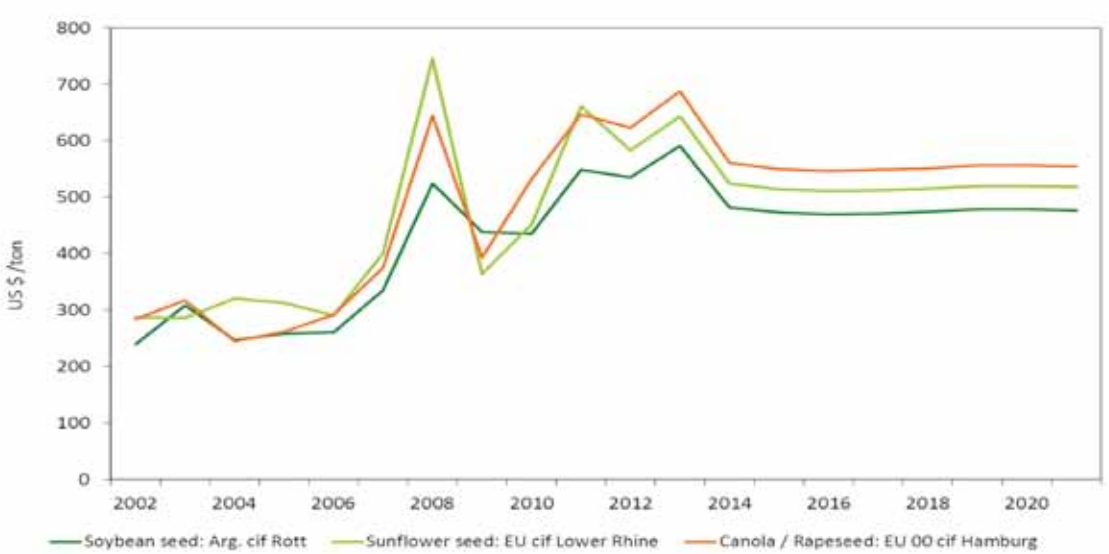


Figure 19: World Oilseed Prices
Source: FAPRI & International Grains Council

DOMESTIC OILSEED SITUATION AND TRENDS

PROSPECTIVE GOOD RETURNS ON maize production and unfavourable planting conditions during the 2012 summer grain planting season led to a projected 30 % drop in sunflower plantings. Soybean producers, on the other hand, increased soybean plantings by 13 % due to strong soybean prices obtained in 2011 and the superior crop rotation benefits of soybeans (Figure 20). The decline in sunflower plantings and the further increase in soybean plantings resulted in soybeans overtaking sunflower seed as the most important oilseed crop produced in South Africa in 2012. Canola, the key oilseed crop in the winter rainfall area, increased to 43 500 hectares in 2011, while a further increase to 50 000 hectares is projected for 2012 (Figure 20).

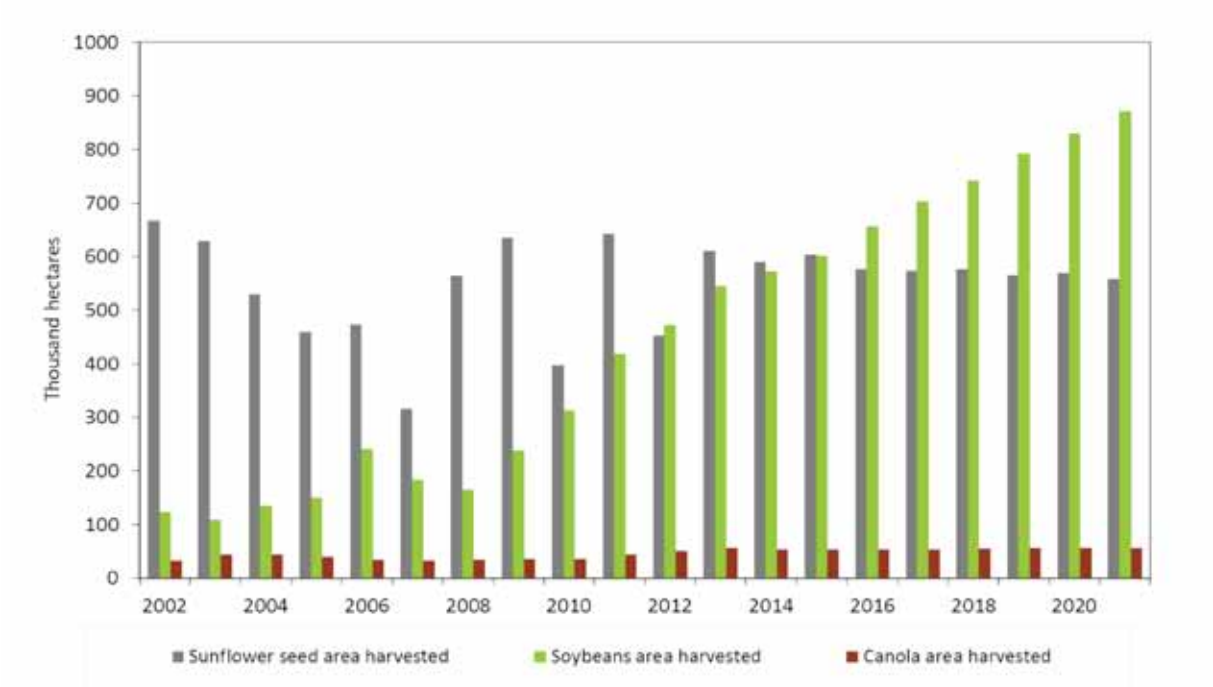


Figure 20: Oilseed area harvested

LOCAL OILSEED PRICES WILL not be left unaffected by the sharp rise in world oilseed prices and sunflower, soybean and canola prices are expected to remain at record levels for the remaining 2012 season as well as 2013. This will provide a major drive for producers to expand the acreage under oilseed production.

Based on the assumption of normal weather, sunflower seed plantings are forecast to increase again to above 600 000 hectares in the coming 2013 season. At trend yields, the local 2013 sunflower crop is projected to recover to above 850 000 tons, which is more than 57 % higher than the 2012 production level.

Over the longer term, sunflower seed plantings are projected to decline to approximately 550 000ha and, but at the same time, yields are expected to improve, which will result in a crop of 900 000 tons by the end of the baseline period (Figure 21). At these production levels, all of South Africa's current underutilised oilseed crushing capacity will have to come back into production and supply and demand will be narrowly balanced with local prices trading in the middle of the import-export parity price band.

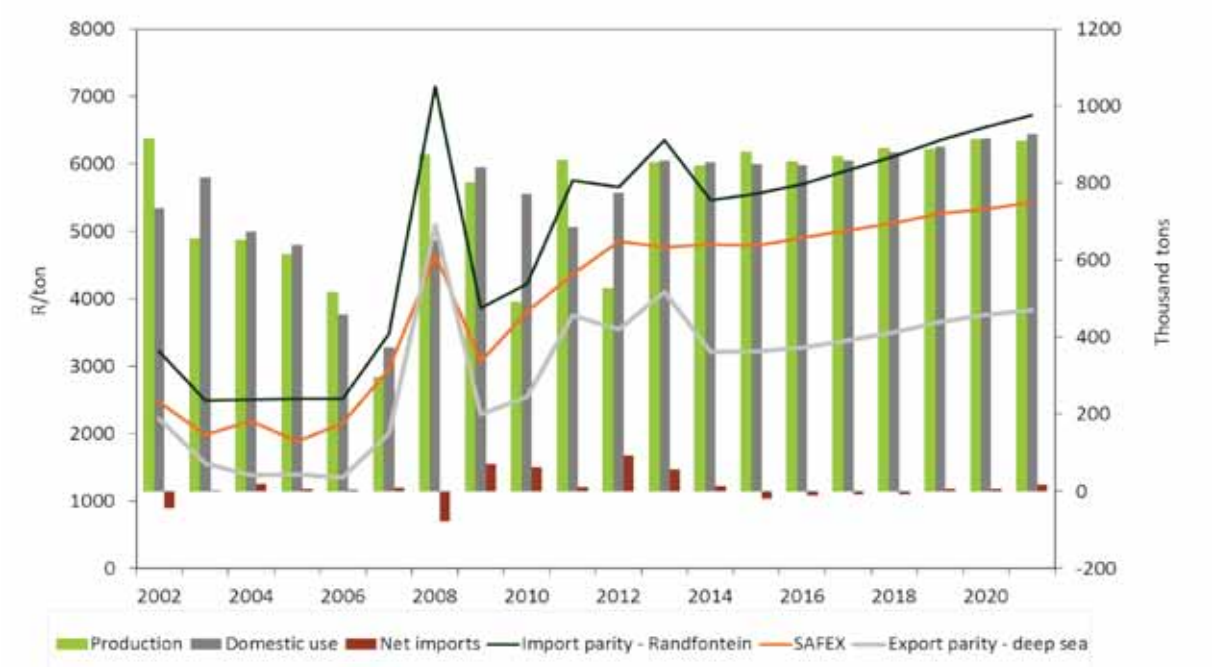


Figure 21: Sunflower seed production, domestic use, trade and prices

IN TERMS OF SOYBEANS, lower yields due to unfavourable weather during the 2012 growing season means that the new season production will be slightly lower than 2011, despite record soybean plantings. Regardless of the generally disappointing yields in 2012, soybean hectares is projected to jump further in 2013 on the back of record high prices that can already be contracted for the 2013 season. The area under soybeans will grow to just below 900 000 hectares as more producers include soybeans on a greater scale in their crop rotation programme (Figure 20). The impact of mining in the Mpumalanga Province will also affect the total expansion in area under soybean production. At the end of the baseline, the total area under soybeans will amount to more than 40% of the total maize area under production. The projected increase together with higher yields will result in a local soybean crop of more than 2 million tons by the end of the baseline period (Figure 22).

Local soybean crushing is projected to grow by a million tons over the next decade as the industry responds to the increased local supply of soybeans. South Africa could remain a net exporter of soybeans destined for premium export markets such as Asia where South African soybeans are well suited for the tofu market, but this market will be small compared to the local activity. Local supply and demand will be closely matched with local production satisfying local demand under normal weather conditions.

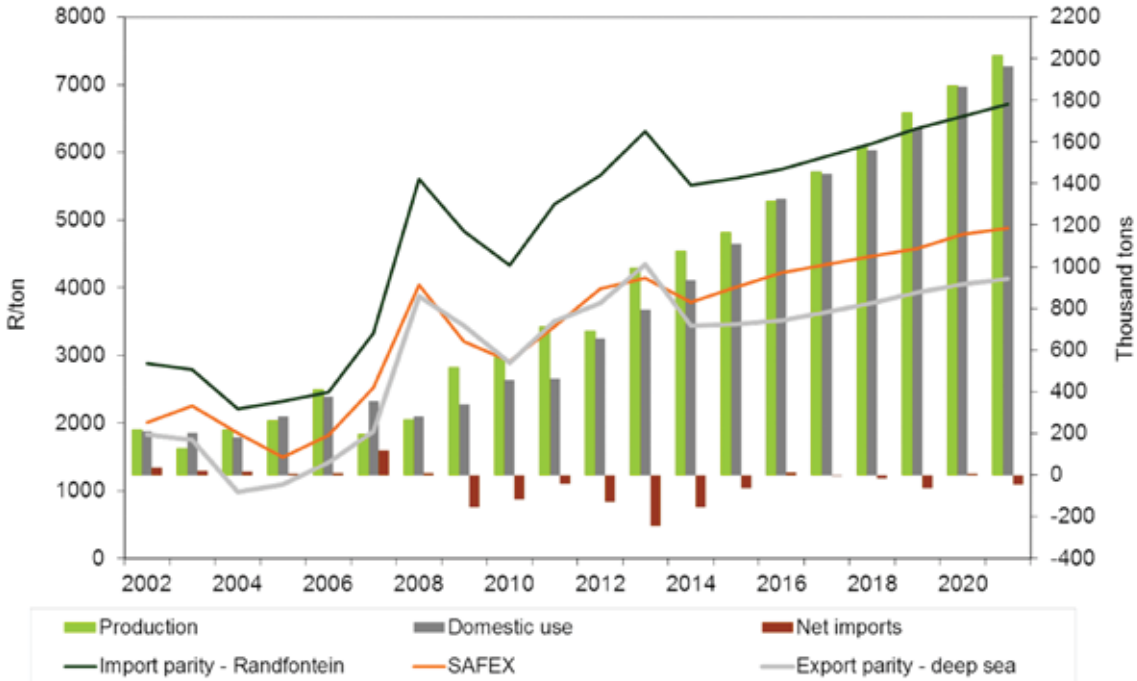


Figure 22: Soybean production, domestic use, net trade and prices

CANOLA PLANTINGS ARE PROJECTED to increase to 50 000 hectares in 2012 and will grow steadily over the baseline period to almost 55 000 hectares in 2021. Production of canola will be slightly higher than use during the first years of the baseline period, but domestic use will grow faster during the second half and is projected to equal production by the end of the baseline period.

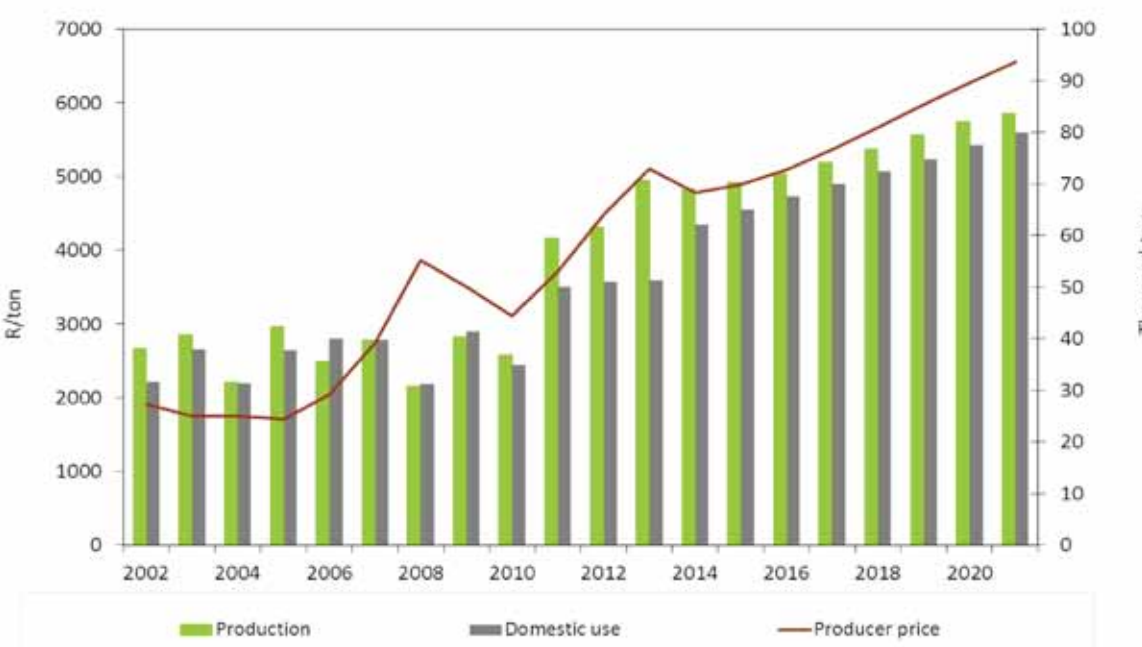


Figure 23: Canola production, domestic use and prices

GLOBAL OILCAKE SITUATION AND TRENDS

THE REDUCED AVAILABILITY OF soybeans and soybean oilcake from South America provided support to international oilcake prices during 2011. The supply of soybean oilcake is projected to remain under pressure due to the drastic reduction in the 2012 US crop and the first relief is only anticipated with the 2013 South American soybean crop. As a result, international soybean oilcake prices are forecast to remain at record levels in 2012 and the first half of 2013 before prices reduce sharply as a major supply response kicks in. The continued growth in the demand for animal products due to increased world income per capita and changing diet patterns in especially developing countries will provide long-term support to soybean oilcake prices.

Due to the spill-over effect of the rising international soybean oilcake price, sunflower oilcake prices increased during 2011 despite ample supplies. Over the longer term, the higher availability of rape seed oilcake in Europe due to increased bio-diesel production is expected to put pressure on the international sunflower oilcake price, keeping it relatively flat (Figure 24).

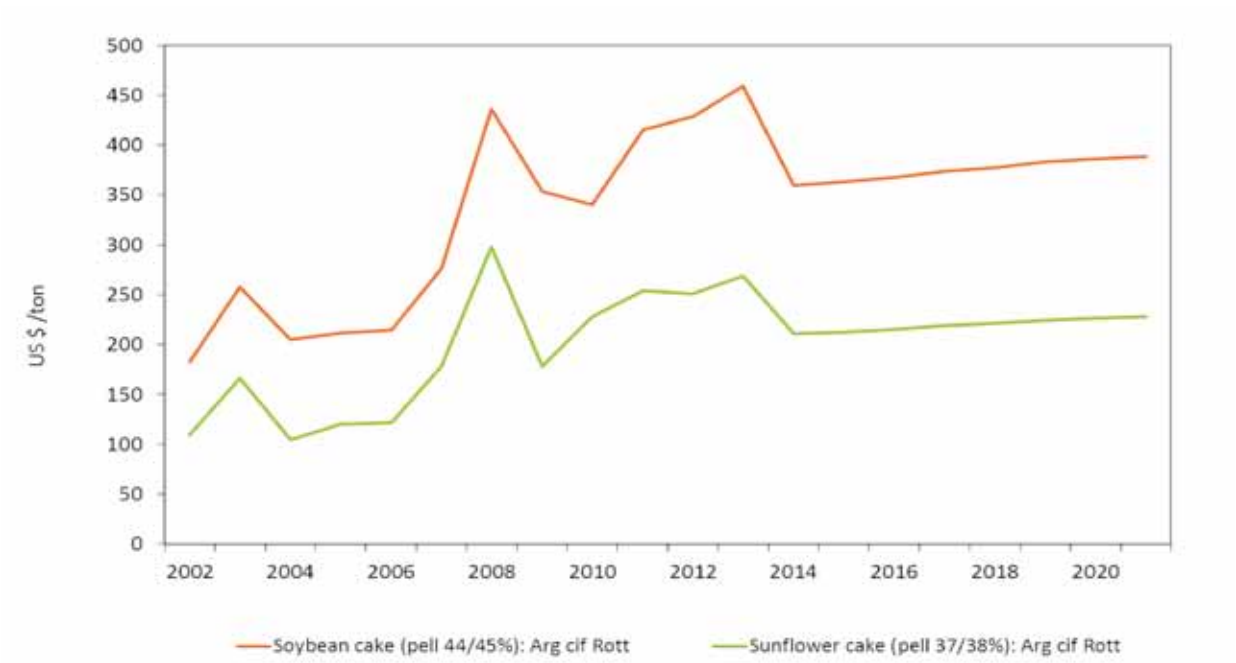


Figure 24: Soybean and sunflower oilcake world prices
Source: FAPRI & International Grains Council

DOMESTIC SOYBEAN OILCAKE SITUATION AND TRENDS

SOYBEAN OILCAKE IS THE preferred protein feed source in South Africa and domestic consumption more than doubled over the past decade. As local production of soybean oilcake was limited in the past, almost all of the local consumption had to be imported. However, local soybean oilcake is projected to increase significantly over the baseline period as the local soybean crushing industry expands as local soybean production grows (Figure 25). By the end of the baseline period, imports are projected to provide only 28 % of the local consumption compared to the 83 % in 2011. This, however, still implies that South Africa will remain a net importer of oilcake and therefore local oilcake prices will continued to be determined by exchange rate fluctuations and international prices. With local soybean prices expected to trade closer to export parity and soybean cake trading at import parity, local crushing margins will remain positive.

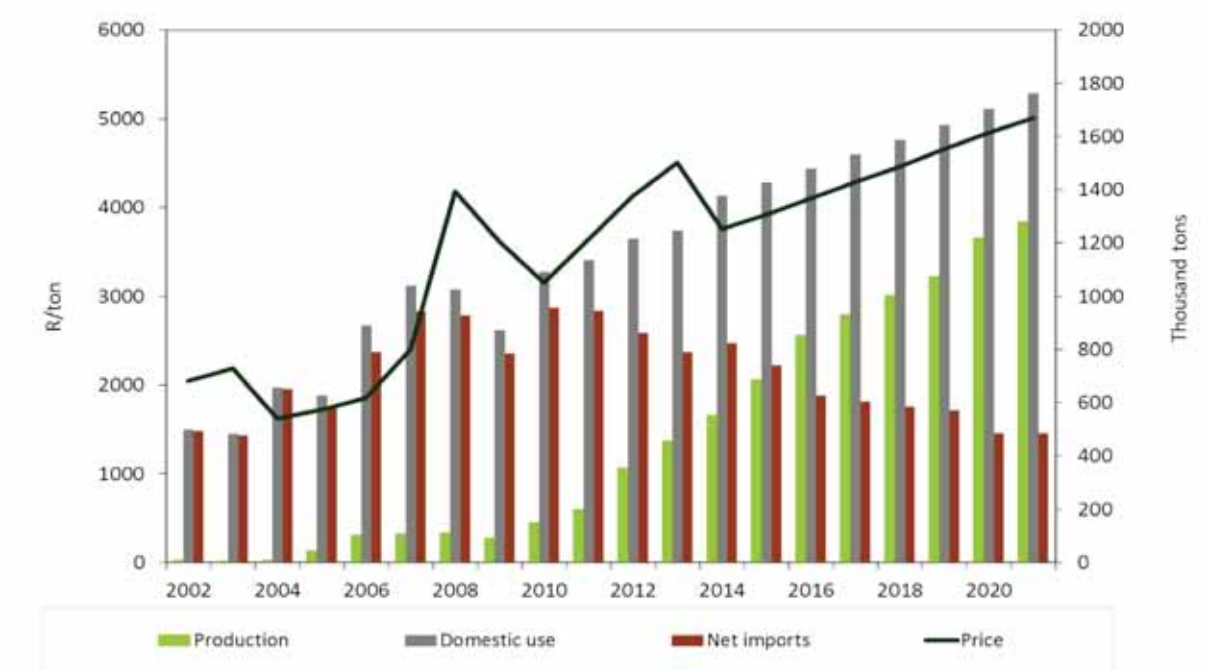


Figure 25: Soybean oilcake production, consumption, trade and prices

GLOBAL VEGETABLE OIL SITUATION AND TRENDS

THE CONTINUED GROWTH IN bio-diesel production will be one of the main drivers of vegetable oil demand during the next decade. As a result of the robust bio-diesel demand forecast, the outlook for soybean oil prices remains positive in the near and medium term despite the softer crude oil price forecast. International sunflower oil prices are expected to decline in 2012 due to ample supply but trade right up again in 2013 as the oilseed complex runs low on stock levels. After a short-term increase in 2013, sunflower oil will trade lower towards the end of the baseline period (Figure 26).

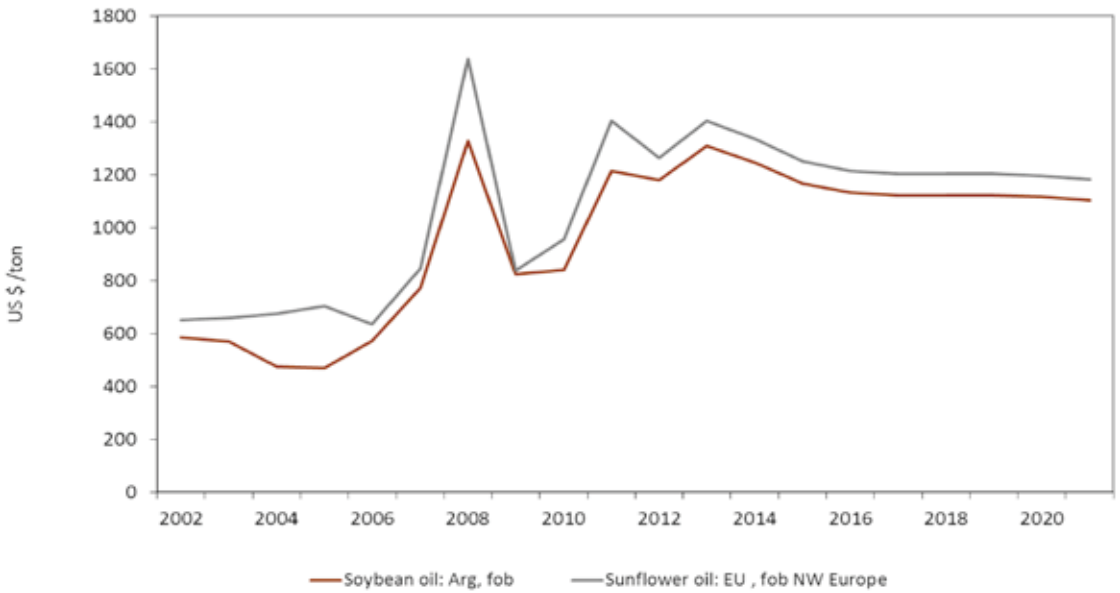


Figure 26: Vegetable oil world prices
Source: FAPRI & International Grains Council

DOMESTIC SUNFLOWER OIL SITUATION AND TRENDS

SOUTH AFRICA IS A NET importer of sunflower and other vegetable oils and therefore local prices are mainly determined by international prices and the exchange rate.

The domestic consumption of sunflower oil is projected to increase by 2.1 % per year over the baseline period to a total of 439 000 tons in 2021. With local production growing slightly slower than consumption over the baseline period, imports are projected to amount to 80 000 tons by 2021 (Figure 27).

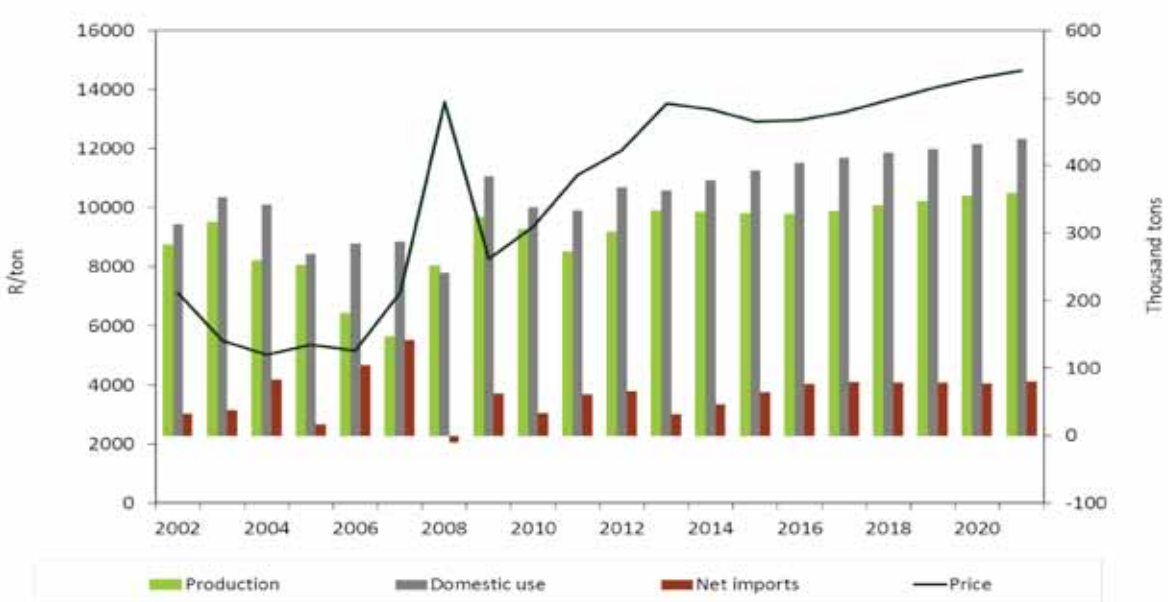


Figure 27: Sunflower oil production, consumption, net trade and prices

BFAP BASELINE AGRICULTURAL OUTLOOK

sugarcane & sugar

OVER THE PAST DECADE, the area under sugarcane production has declined by more than 12 %. Apart from rising input costs and transportation costs to mills, industry experts argues that a number of external influences such as urbanisation in the coastal regions, land claims, unsuccessful land reform projects in the midlands areas and high fertilizer prices have all contributed to this declining trend. In the past couple of years, seasonal droughts have also impacted negatively on the financial state of sugarcane farmers. Further proof that the area under sugarcane has been negatively affected by more than economic reasons is the fact that sugarcane prices have almost doubled over the past five years, mainly driven by international world prices, which have been boosted by the production of ethanol from sugarcane in Brazil.

However, the industry seems to be more upbeat about the current production season, with the sugarcane area harvested increasing by almost 15 000 ha from the past season. Sugarcane production is projected to increase to well over 18 million tons from the 16.8 million ton harvest in the previous season.

The outlook on sugarcane prices is favourable and is projected to increase by an annual average of approximately 7 %. With an expected annual average increase in fertilizer cost of below 3% per annum, the area under sugarcane is anticipated to stabilise at around 382 000 ha.

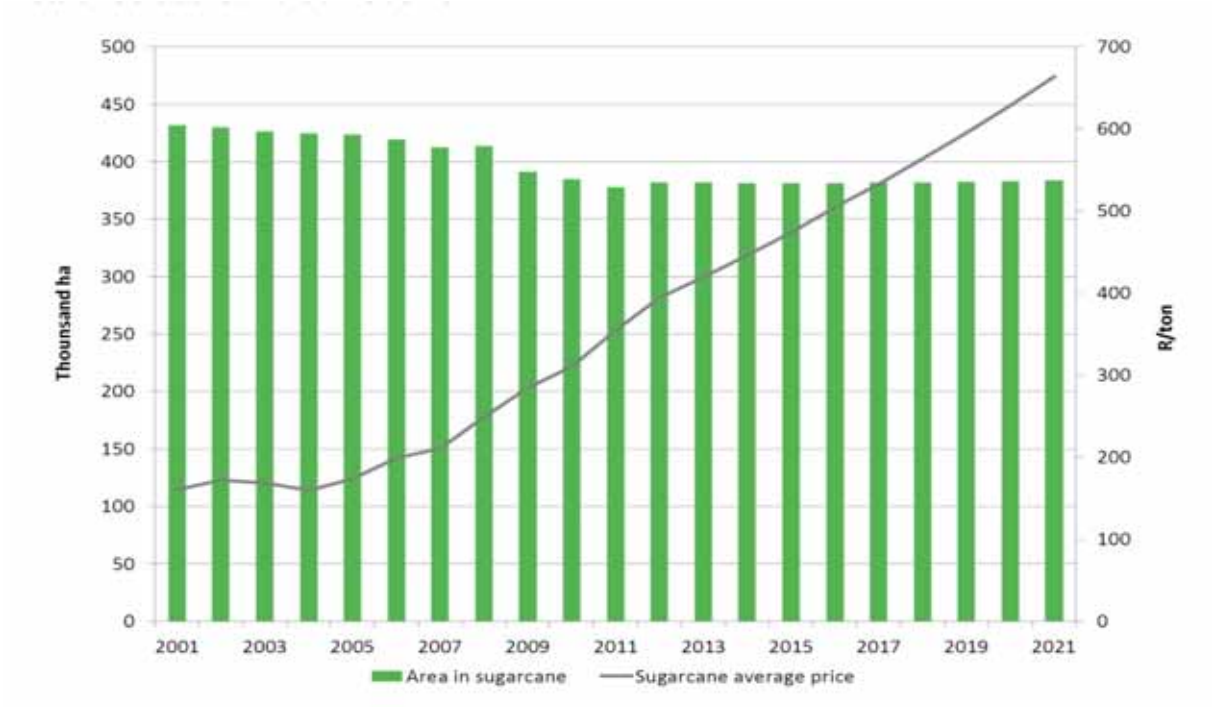


Figure 28: Sugarcane area and price

CANE YIELDS ARE EXPECTED to remain constant, with changes subject to weather conditions. The average yield will increase from around 62 tons per hectare in 2012 to 65 tons per hectare in 2021. Sugar imports continue to compete with domestic production. In 2010/11, approximately 85 000 tons entered the South African market, most of which originated from Brazil. High world prices have reduced the quantity of imports but it is expected that the average level for imports over the baseline period will be around 120 000 tons per season. Swaziland imports are still entering the country as the trade policy harmonisation efforts between the respective governments have yet to be implemented. Total exports of Swaziland sugar to the other SACU countries is expected to continue throughout the baseline period, with a seasonal average of 300 000 tons entering the market. In other words, more than 400 000 tons of imported sugar will enter the South African market by 2021.

South African sugar exports have been hampered by the drought in the 2010/11 season, but with more favourable weather conditions total exports are expected to recover and stabilise around 300 000 tons for the remainder of the outlook period (Figure 29). This is still very low compared to exports of close to 1.5 million tons in 2002.

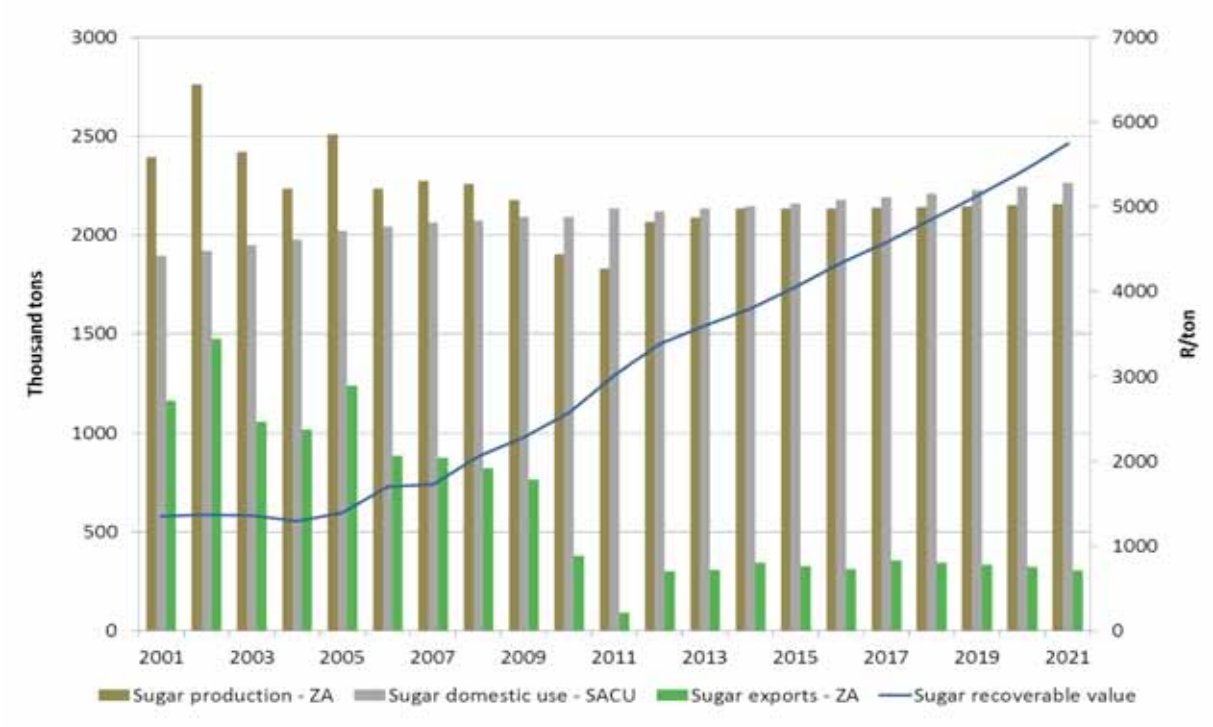


Figure 29: Sugar production, consumption and the RV price

THE INDUSTRY IS CURRENTLY reviewing a number of proposals to improve the general incentives for re-investment in the industry, which is vital to unlock and regain full capacity. There are a number of institutional issues to be resolved and the future of the Sugar Act is being debated. New initiatives that are being considered to improve the efficiency of the industry include the production of biofuels from sugar, yet without substantial tax rebates and other financial incentives, the production of bioethanol from sugarcane is not economically sustainable under the baseline assumptions.

Other renewable energies are also presently under consideration, for example the co-generation of electricity from bagasse. The sugar industry has developed various strategies to ensure active participation in the value-adding process. The first co-generation projects are expected to come online in the next few years, which in turn will benefit industry role-players and improve the economics of cane farming, depending on the principles of the division of additional proceeds from co-generation as well as any legislative changes to the Sugar Act. The additional revenue is expected to improve yields and maintain production. Figure 30 presents the impact on the area under sugarcane if a co-generation tariff of R1.84 is introduced in 2012, which grows to R2.87 by 2021.

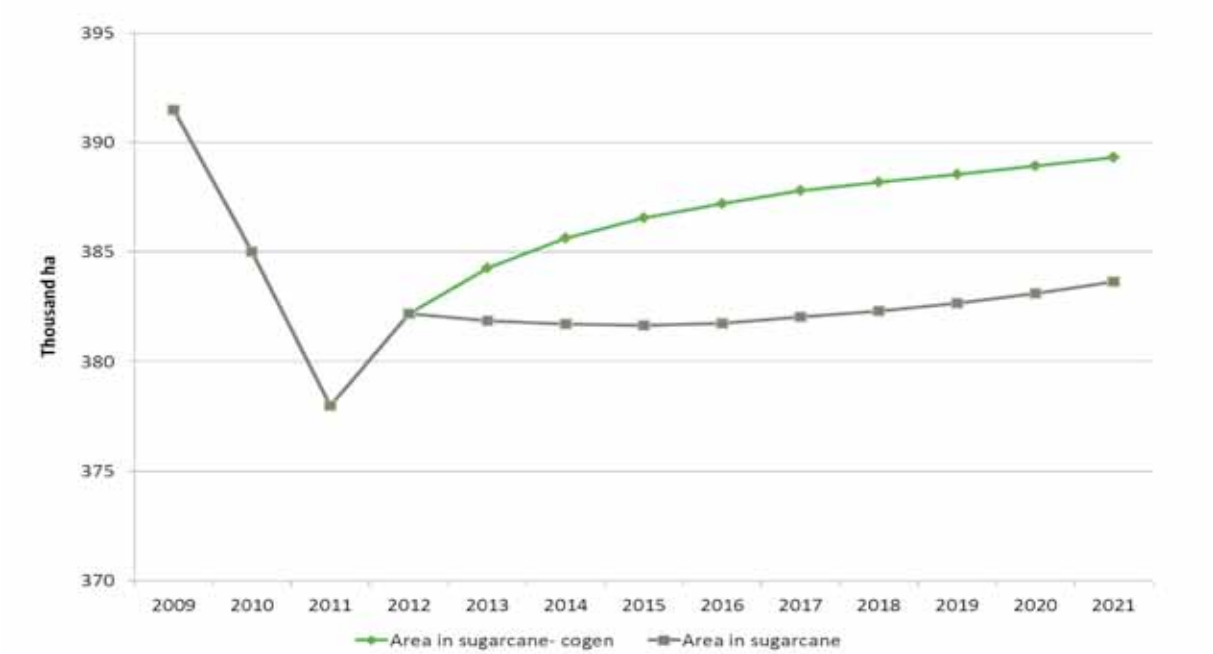


Figure 30: Alternative scenario for the sugar industry - cogeneration

BFAP BASELINE AGRICULTURAL OUTLOOK

meat

MEAT – GLOBAL

GLOBAL MEAT PRICES HAVE recovered significantly from 2009 levels, following positive economic signals. Beef prices were most affected by the economic crises, as consumers switched to cheaper animal protein, resulting in chicken markets that remained relatively strong throughout the crisis. The recovery in prices has therefore also been greater in the beef market, where the longer production cycle caused a slower supply response to increased demand than in the chicken market. Though increased demand has been a factor, the recovery in prices is also due to a contraction of supply. World stock numbers have declined and in the US the cattle herd numbers are the lowest since the 1960s. Despite positive economic signals, extremely dry weather conditions in the US prevented the industry from responding in the normal way. Higher profits over the past two years have allowed a number of countries to rebuild herds, with Australian beef production expected to reach a record high in 2012. The European debt crisis has also depressed European demand slightly in 2012, allowing the price to stabilise in 2012 following the rapid increase from 2009 to 2011. Similarly, tight supply in 2011 led to increased lamb prices worldwide. With the EU market not importing its normal levels and improved stock numbers leading to increased production, New Zealand and Australian lamb prices have declined steadily since November 2011 after significant gains from 2009 to 2011.

The profit margins of pork and chicken farmers came under increasing pressure in 2011 due to the spiralling feed prices. While pork prices grew strongly, along with feed costs, chicken prices failed to keep up, placing significant pressure on farmers' margins. This follows a brief period in 2010 during which profit margins improved significantly due to higher chicken and pork prices with feed costs remaining relatively stable.

- The OECD-FAO Outlook projects that world consumption of meats over the next decade will continue to expand at a consistent rate. World poultry consumption is projected to grow by 2.2% per annum over the next decade, followed by beef (1.8% per annum) and sheep meat (1.8% per annum), and finally pork (1.4% per annum).
- The recovery in meat prices has already induced a phase of rebuilding stock numbers and, over the long run production will expand in order to match consumption of meat.

- Whereas US beef prices are expected to remain high in 2012 and 2013, the increased supply of meat due to the current stock building phase will cause prices to trade softer over the outlook period. Pork markets are projected to follow a typical cyclical trend, entering into a declining trend after a peak is reached in 2012.
- Despite consistent growth in demand over the outlook period, chicken prices increase only marginally. After widening significantly in 2010, the margin between beef and chicken prices decreases again towards the end of the baseline.
- The world price for lamb is projected to retreat slightly from record levels in 2011 and trade softer in 2012 and 2013 as supply out of major exporting countries such as Australia and New Zealand increases.

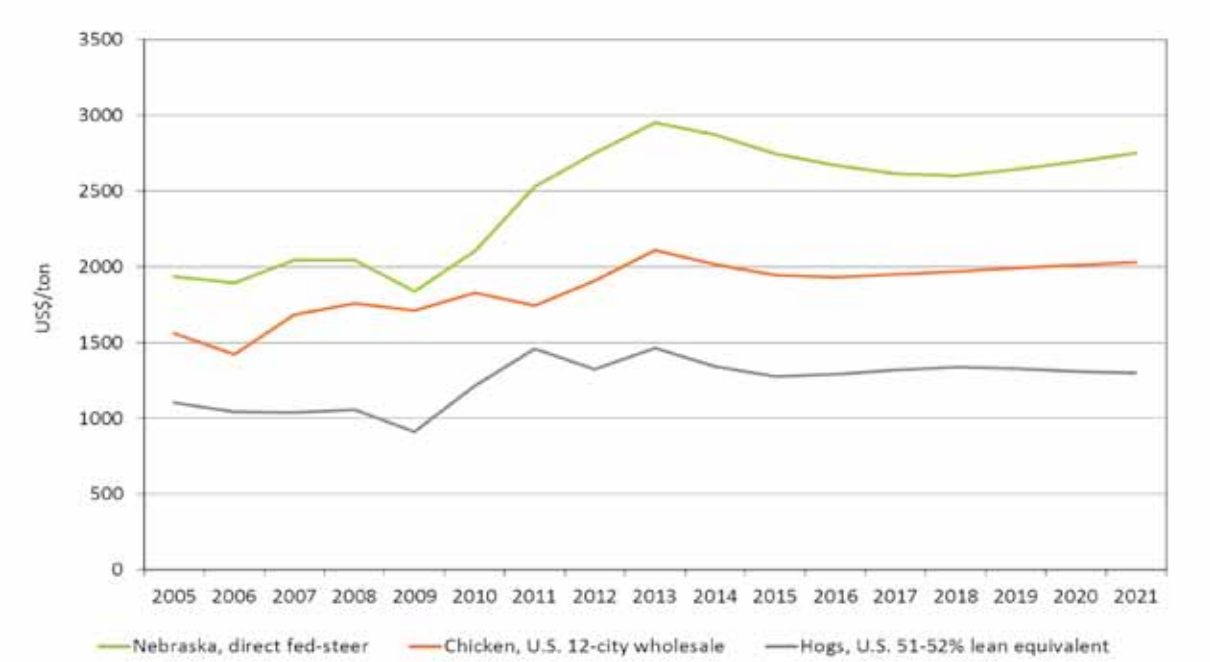


Figure 31: World meat prices
Source: FAPRI 2012 & BFAP updates

MEAT AND EGGS – SOUTH AFRICA

OVER THE PAST TWO seasons, the domestic meat and egg markets have been characterised by exceptional volatility. The price margins between the various types of meat changed continuously as the impact of key exogenous drivers differed from one industry to the next. Although cross substitution relationships do exist, the fundamental equilibrium pricing conditions differ between the various industries, which implies that over the short run the margins between the various types of meat can fluctuate as exogenous drivers shift. Not only did market prices drive the uncertainty in the meat industry, but the outbreak of Rift Valley Fever and more recently Foot and Mouth Disease has also influenced the behaviour of role players in the market.

Feed costs and the level of import parity prices play an important role in the formation of prices in the poultry and pork industries, as these key indicators are used in the price negotiations between major producers and buyers. With the appreciation of the Rand and feed prices trading softer in 2010, chicken and pork producer prices came under severe pressure. The appreciation of the Rand outweighed the increase in international chicken

prices, therefore making imported chicken more attractive. Lower prices boosted consumption and in the case of chicken meat, consumption in 2009 rose by more than 6.2 % per year from 1.52 million tons to 1.71 million tons in 2011. During the same period, chicken production increased by only 95 000 tons and, as a result, chicken imports rose by 29 % per year. In 2011, increased feed prices accompanied by a strong Rand and the associated increase in imports placed chicken producers under severe pressure. With the import parity price of imported whole birds originating from both Argentina and Brazil still trading significantly below the domestic price for whole frozen chicken (Figure 32), the trend of increased imports looks set to continue. This is noteworthy, as the chicken industry employs roughly 51 900 people as well as having a significant influence on the 48 500 people employed through upward and downward linkages (maize and soya industry) as the largest consumer of animal feed. If increased consumption could be met with local production instead of imports, the contribution to employment could be significant.

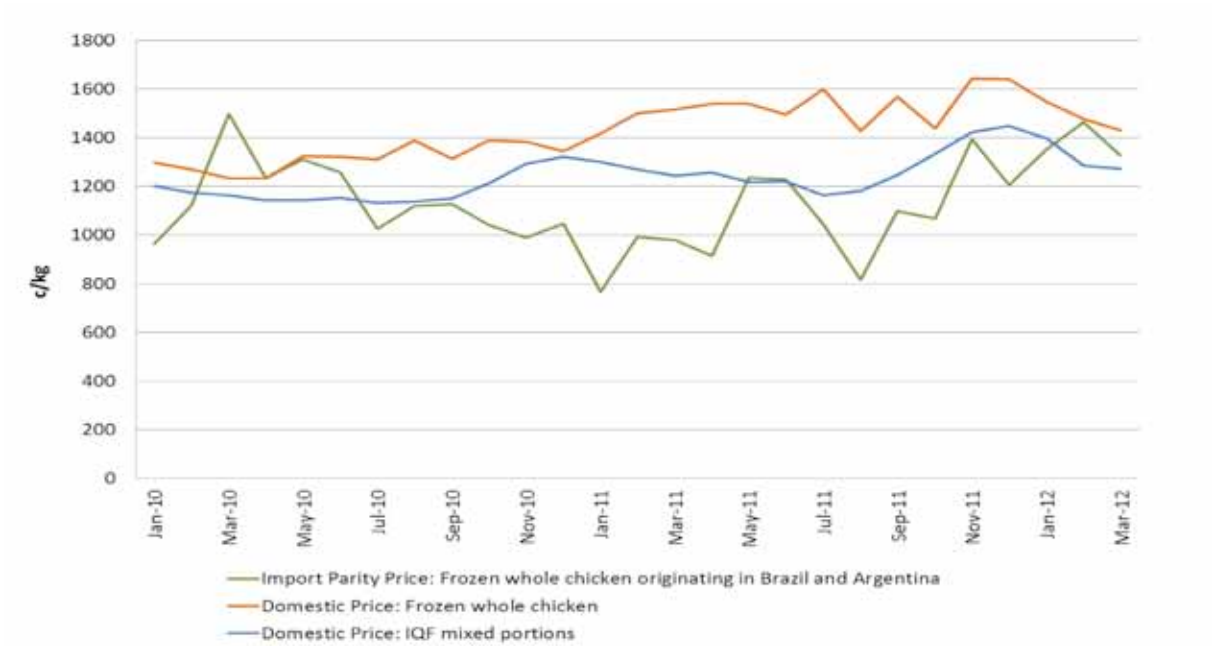


Figure 32: Chicken domestic price vs. import parity price (whole birds) comparison

THE PRODUCER PRICES OF eggs also declined in 2011 for the second year running. The lower price resulted in local egg producers not matching the increase in local consumption of eggs, resulting in a decrease in the level of egg exports into neighbouring countries.

Lamb and beef prices found significant traction in the market place and increased from 2010 to 2011. South Africa is a net importer of sheep meat and with a strong correlation between domestic and import parity prices, lamb prices increased on the back of the higher import parity prices. The parity prices increased as soaring international prices due to limited exports from New Zealand outweighed the bearish impact of the appreciating Rand exchange rate.

The impact of the financial crises on the local beef market seems to be almost negligible when compared to the impact on, for example, the US beef market where prices declined by approximately 10 %. At the heart of the financial crises in 2009, the contraction of 3 % in the consumption of beef was matched by a 3 % contraction in supply, and beef prices posted marginal gains. Calf

prices remained constant as the feeding margin of feedlots did not improve, as grain prices remained relatively high. In 2010, with the gradual recovery of real disposable income of consumers and South Africa's hosting of the soccer world cup tournament, the demand for beef increased by 45 000 tons (6 %) and beef producers responded by increasing the number of carcasses slaughtered and the average weight of the carcasses. During 2010, beef prices posted solid gains, especially in the last quarter of 2010. Higher carcass prices and lower feed prices boosted the feeding margins of feedlots in 2010 and calf prices increased sharply as the demand for veal increased. In 2011, feed prices and calf prices were higher, placing pressure on feedlot profit margins. The beef price also increased in 2011, before decreasing sharply in the first part of 2012.

Over the next decade the growth in the consumption of chicken meat is projected to outpace the growth for all the other types of meat. With an increase of 48 % over the next decade (compared to 70 % over the period 2000–2010), the total consumption of chicken meat is projected to reach almost 2.4 million tons by 2020. This implies that per capita consumption of chicken meat will exceed 45 kg by 2020. The consumption of eggs is also expected to increase by 35 % (compared to 22 % over the period 2000–2010), exceeding 500 000 tons by 2020. Beef consumption is expected to grow by 23 % (compared to 24 % over the period 2000–2010). Although the mutton market is relatively small, growth of 20 % (compared to a contraction of 7 % over the period 2000–2010) is expected over the next decade. Pork consumption is projected to grow by 46 % (compared to 41 % over the period 2000–2010) until 2020 (Figure 33).

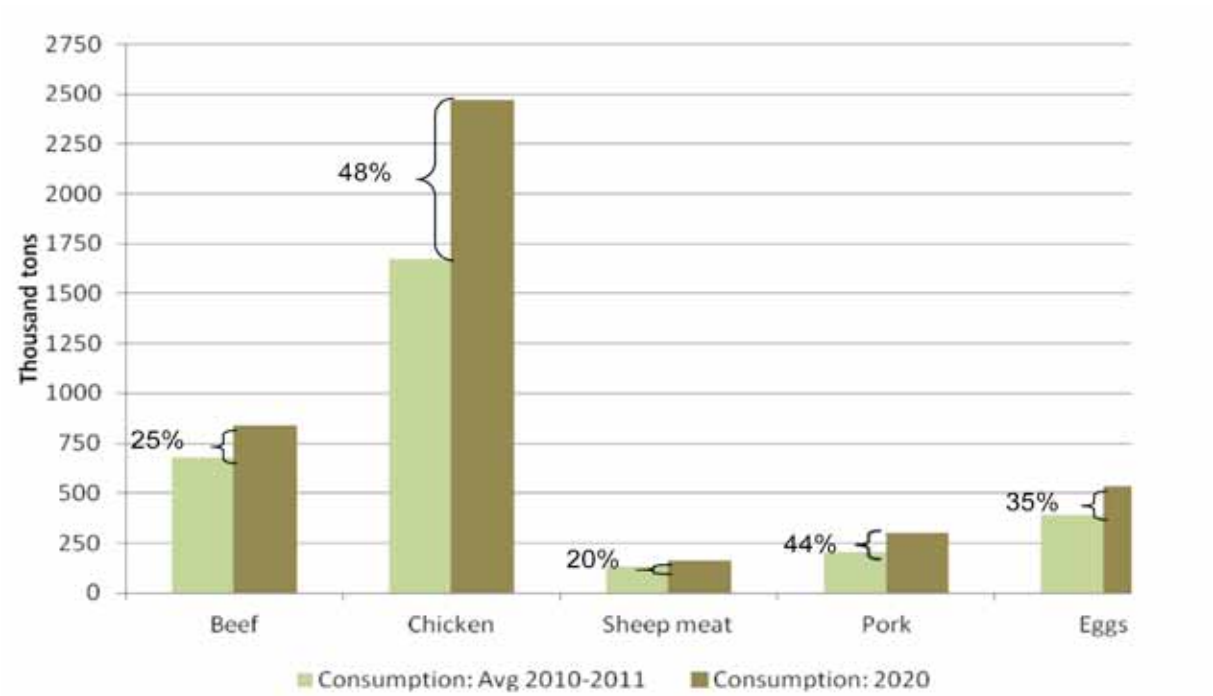


Figure 33: SA meat consumption

SA IS EXPECTED TO remain a net importer of chicken meat as the annual average growth in production (2.8 %) is outpaced by the growth in consumption (4.5 %) over the outlook period. Chicken production will increase to 1.8 million tons over the next decade. Approximately 657 000 tons of chicken meat will be imported in 2020.

The chicken to maize price ratio is one of the key indicators illustrating the potential profit in the industry (Figure 34). Although the profitability increased rapidly in 2009 as grain prices started to fall, the ratio deteriorated again in 2011 with higher feed costs and stagnant producer prices of chicken. The price ratio will remain relatively constant over the medium term, with a slightly upward trend towards the final years of the baseline, as the average annual increase (nominal terms) in chicken prices of 5.7 % marginally outpaces the projected increase in yellow maize prices of 5.1 % per annum.

Despite a high level of volatility over the past decade, the producer price of eggs has on average increased at a faster rate than feed costs (maize) and this trend is projected to continue over the period of the outlook (Figure 35). This positive output–input price ratio supports the expansion of the local industry in order to match the increase in per capita consumption.

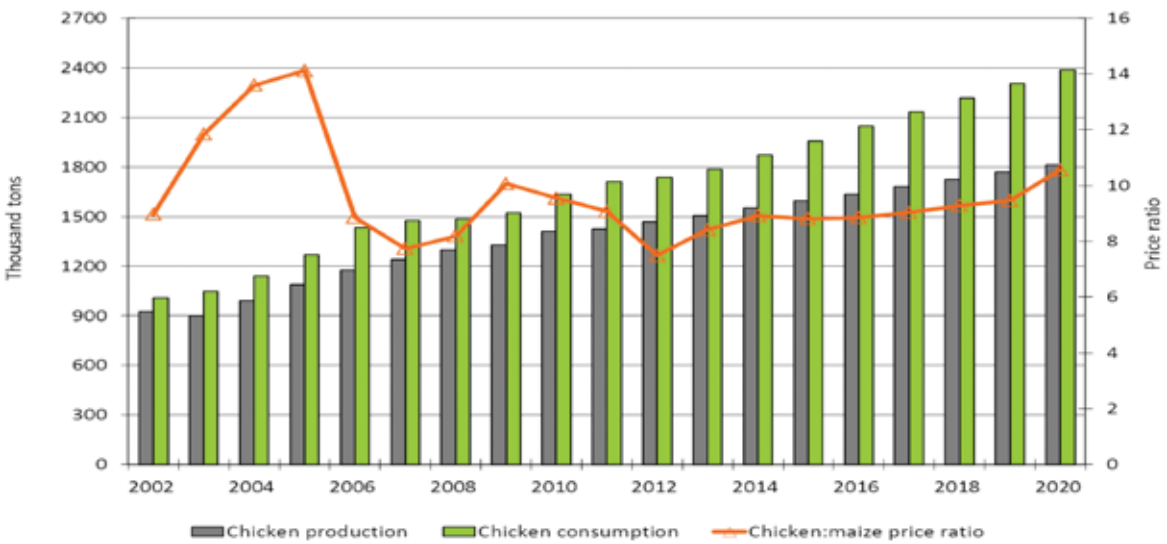


Figure 34: SA chicken production, consumption and chicken-maize price ratio

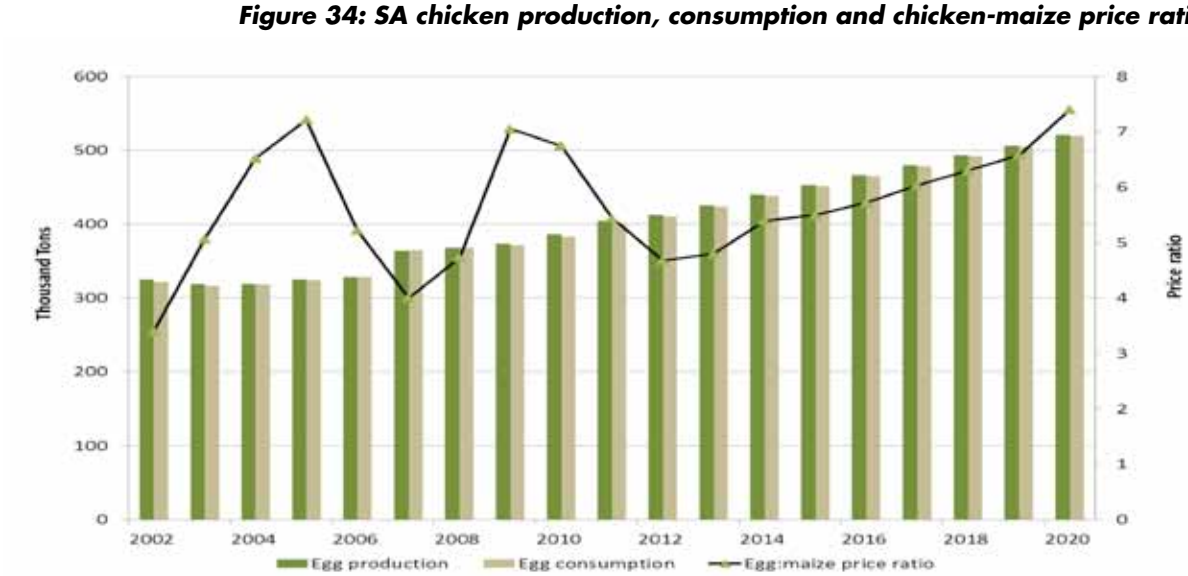


Figure 35: SA egg production, consumption and egg-feed price ratio

OVER THE LONG RUN, demand and supply of beef is projected to grow at a constant rate, improving on the growth that was recorded over the past decade. The typical cycles will recur as restocking of herd numbers takes place on the back of significant increases in prices (as in the 2011 season), which will be followed by periods of slower growth in prices due to increased supply.

Prices have been in an upward swing to 2011, but from 2012 are expected to trade sideways and become relatively volatile for a period of time, before increasing at a constant rate from 2015 onwards. With a projected annual average growth rate of 6.5 %, nominal beef prices will reach R44/kg in 2020, which implies that with a target inflation rate of approximately 6 % over the next decade, beef prices are expected to grow in real terms by only 0.5 %.

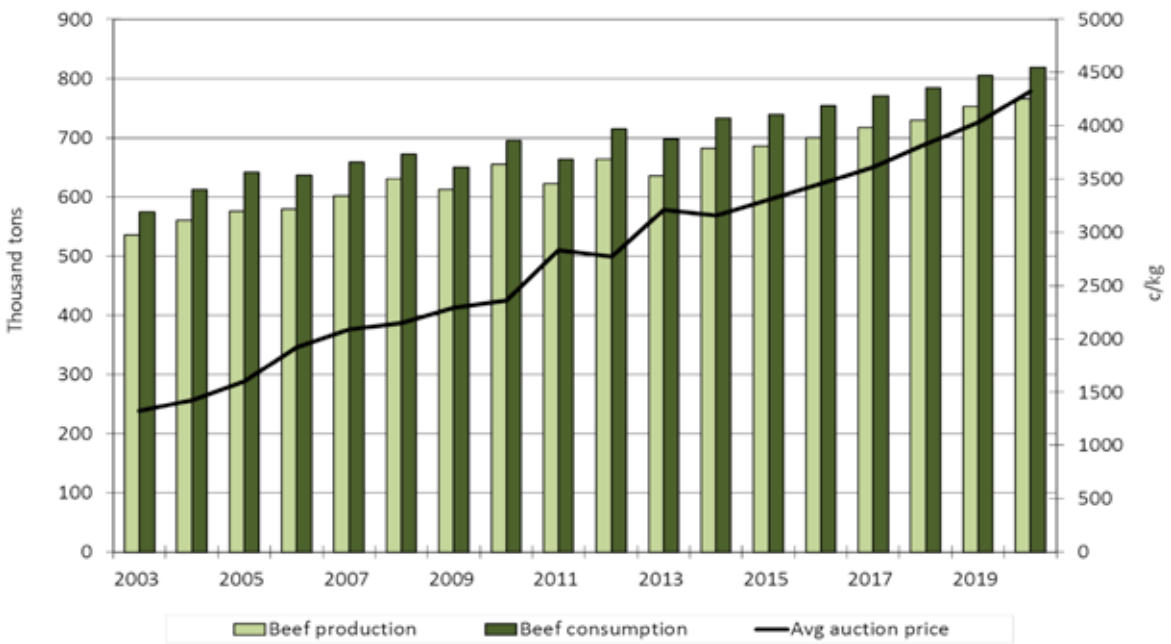


Figure 36: SA beef production, consumption and price

WHEN MAIZE PRICES ARE low, maize producers who also have a livestock production enterprise typically aim to realise a higher value for their maize by feeding it to calves which are not marketed immediately. Consequently, in years where maize prices are exceptionally low, calf prices tend to increase rapidly as the calf supply contracts in the short term. If beef prices are not supported by strong demand for beef, the result is that calf prices as a percentage of beef prices increase rapidly, which holds a significant risk for the producers since beef prices could come under significant pressure when these animals are finally sold.

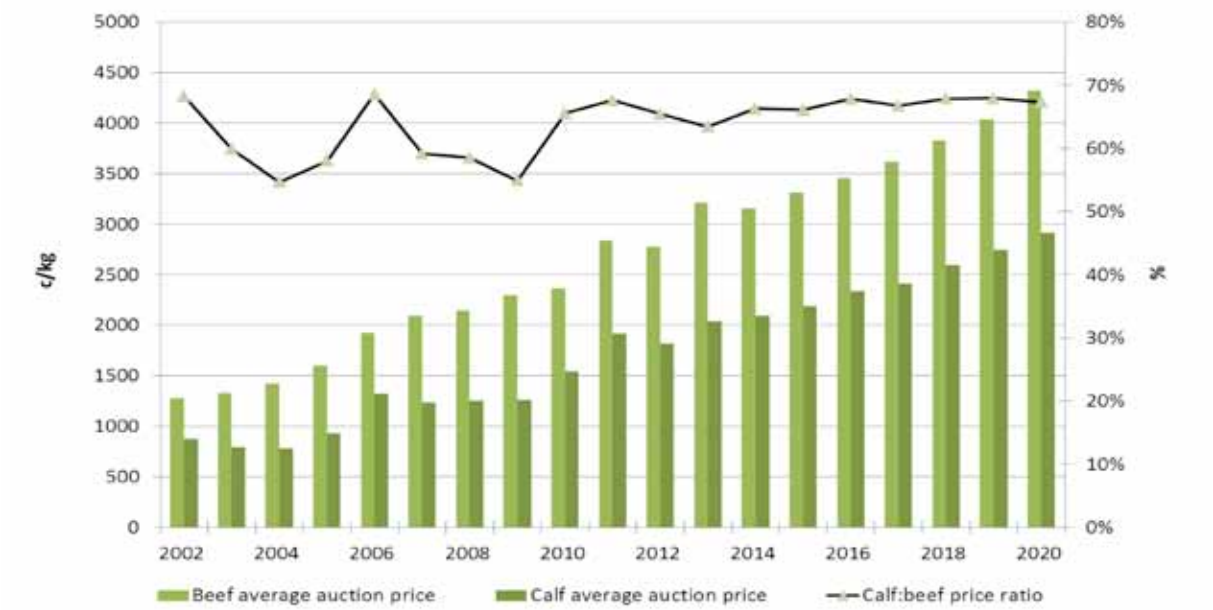


Figure 37: SA beef price versus calf price

OVER THE PAST YEAR, lamb prices have broken away completely from the other types of meat, spiralling upwards as local supplies cannot meet demand and import parity prices have increased sharply on the back of international prices that have reached record levels. The price is expected to decrease slightly in 2012, before stabilising on the back of lower lamb prices in New Zealand and Australia.

The lamb price is expected to increase at an annual rate of 4.4 % over the outlook period in nominal terms. This is less than the expected inflation rate of 6 %, leading to a price decrease in real terms and hence the negative trend in production but a positive trend in consumption of lamb over the long run.

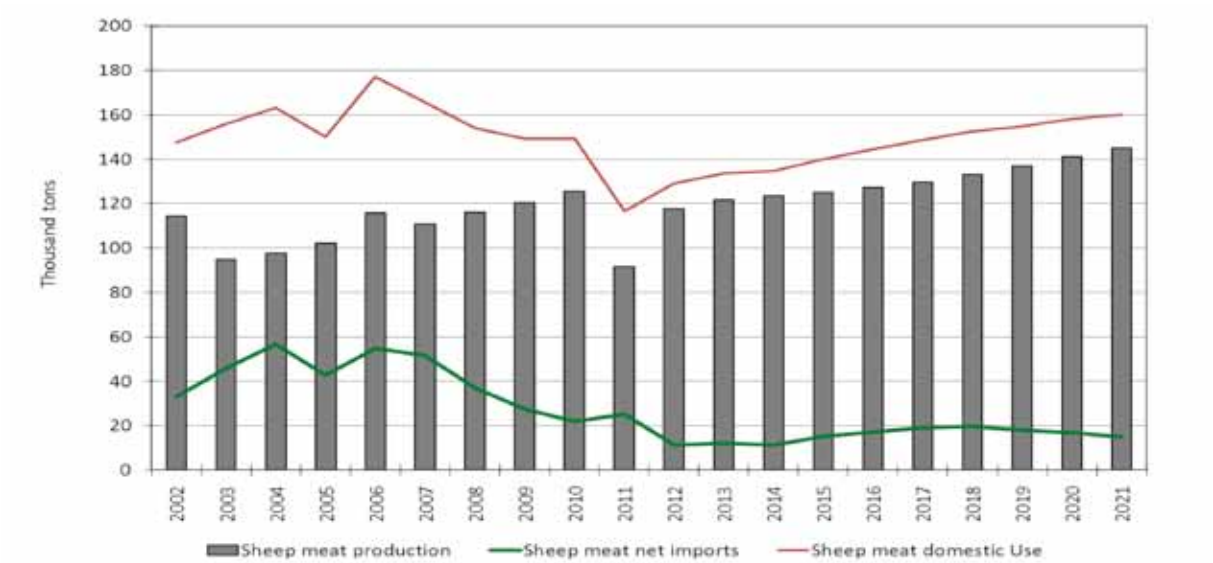


Figure 38: Sheep meat consumption and imports

South Africa is expected to remain a net importer of pork. During periods of an appreciating exchange rate, cheaper imports pose a greater threat to the domestic industry. Since the origin of most imports is either France or Germany, the sharp depreciation in the Euro relative to the Rand in 2010 and 2011 opened a window for imports to increase, before a stronger Euro in 2012 decreased imports again. Mainly ribs are imported.

Pork production responded to better prices and increased to more than 185 000 tons in 2011 (Figure 39). This increase in production was in response to an increase of 12 % in consumption. Consumption is expected to decline slightly in 2012 in response to the decreasing beef price, before gradually increasing over the outlook period. Over the baseline the growth in production of 41 % marginally outpaces the projected growth in consumption of 38 %. As a result pork imports will increase to approximately 35 000 tons by 2020.

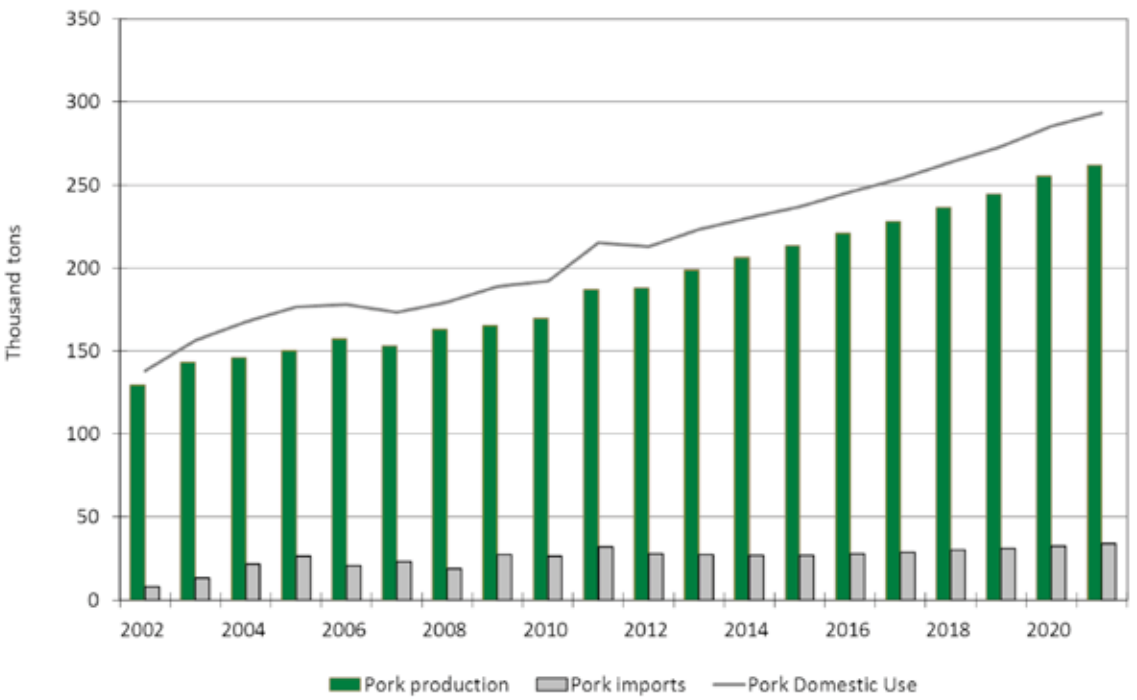
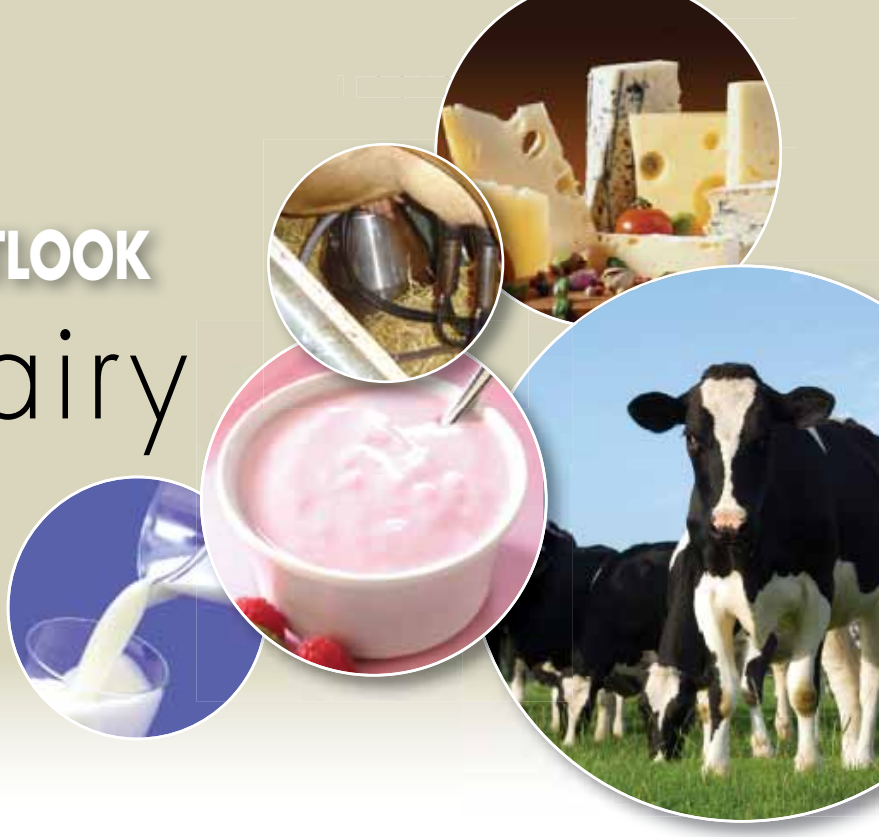


Figure 39: SA pork production, consumption and imports

BFAP BASELINE AGRICULTURAL OUTLOOK

milk & dairy products



MILK AND DAIRY – GLOBAL

INTERNATIONAL DAIRY MARKETS HAVE been characterised by extreme volatility in the past five years. This volatility can be ascribed to changes in the supply and demand balance, as a result of exogenous factors such as unstable weather and weak economic conditions. Strong economic growth and restricted supply due to unfavourable climate caused prices to surge in 2007. The resultant supply increase caused prices to decline in 2008 and as major economies moved into recession, the decline in prices accelerated rapidly to 2009. As the world economy showed signs of recovery, dairy markets followed as demand strengthened on the back of improved disposable income. Stockpiling of butter and milk powder by the USA and EU also limited supply in the market, assisting the price recovery. A gradual increase in 2010 and the first part of 2011 lead to prices reaching a level in March 2011 equivalent to 85 % of the highest price in the 2009 peak. The past year has again been characterised by a downward trend in the prices of all dairy products. This decline can be ascribed to high milk production resulting from higher 2011 prices and increased uncertainty in the world economy as a result of the European debt crisis.

As only about 6 % of world production of dairy products is traded in the world market, climatic conditions in major exporting countries play a significant role in the determination of world market trends. A small shift in the supply conditions of any one of the major exporting countries can have a major impact on world markets and as a result, unpredictable and unstable weather conditions can lead to extreme price volatility in the world market. Subject to the assumption of normal weather conditions, it is expected that the supply out of the southern hemisphere will cause the downward trend that started in the second half of 2011 to continue until 2014, after which prices are expected to increase gradually over the rest of the outlook period, as producers adjust supply as a result of lower prices. Despite the current decline from 2011 levels, the price for the entire outlook period is still expected to stabilise well above the levels experienced before the 2007 price hike.

The dairy industry is expected to be one of the fastest growing agricultural industries over the next decade, with production of fresh milk and dairy products, whole milk powder and butter increasing by an annual average of more than 2.5 % in order to match the sharp increase in consumption in developing countries. World production of cheese and skim milk powder is expected to increase by 1.9 % and 1.5 % per annum, respectively.

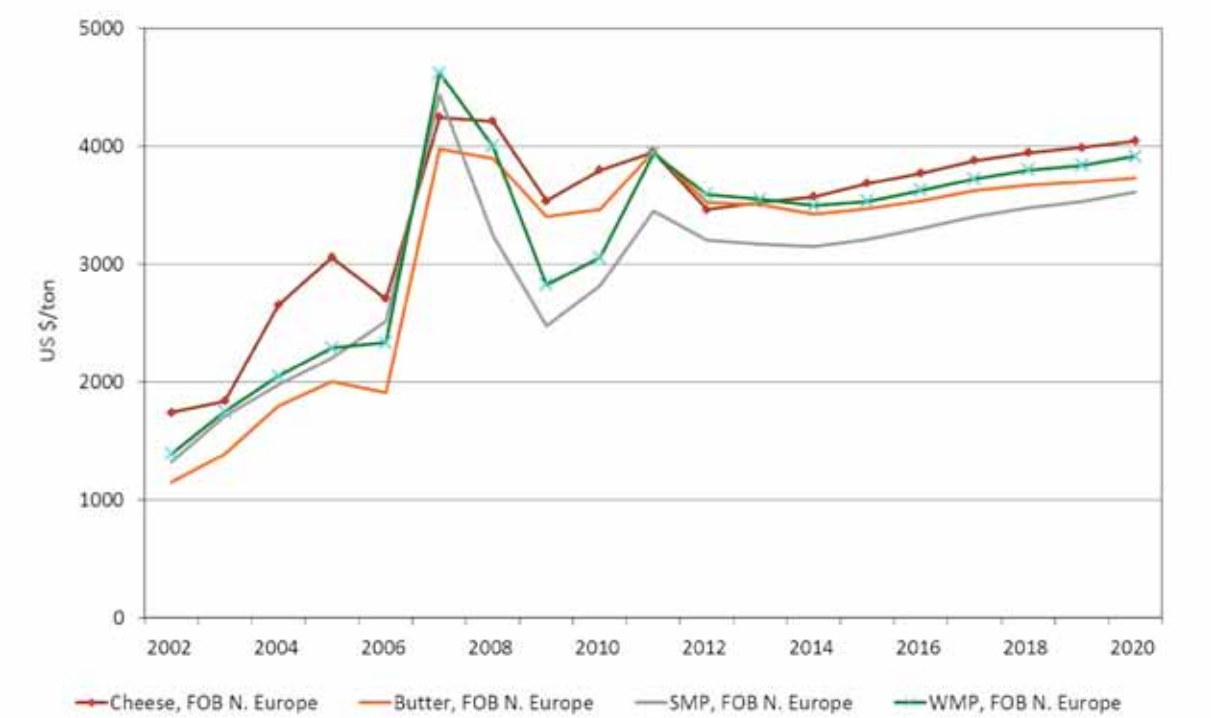


Figure 40: Global dairy prices
Source: FAPRI 2012

MILK AND DAIRY – SOUTH AFRICA

A TIGHT BALANCE HAS existed between the production and utilisation of fluid milk in South Africa for many years, resulting in constant shifts of the equilibrium price following a typical cycle. A favourable milk/feed price ratio, as experienced in 2009 and 2010, induced the expansion of milk production through 2010, which resulted in lower milk prices in 2011. Lower milk prices caused production to slow down, with production remaining constant in 2011 despite increased consumption. The result is higher producer prices in 2012. Despite the volatility in prices however, the industry is constantly expanding due to the growing demand for dairy products. Over the past decade, the dairy industry has expanded by 25 %, with total consumption of dairy products increasing from 2.1 million tons in 2001 to 2.68 million tons in 2011. Relatively lower feed grain prices in 2010 boosted production to a record level of 2.68 million tons, consequently causing the producer price of milk to decrease towards the end of 2010 and 2011. With the milk/feed price ratio declining significantly in 2011 and 2012 as a result of increased feed prices, production remained virtually unchanged in 2011, before an expected increase of only 1 % in 2012 following improved demand for dairy products.

After a marginal decrease in 2011, the producer price of milk is expected to increase in 2012 on the back of increased feed costs and greater demand for milk products as consumers' disposable income increase. The price is expected to grow at an average rate of 7.8 % per year over the next decade, resulting in an average price increase of around 1.8 % per year in real terms.

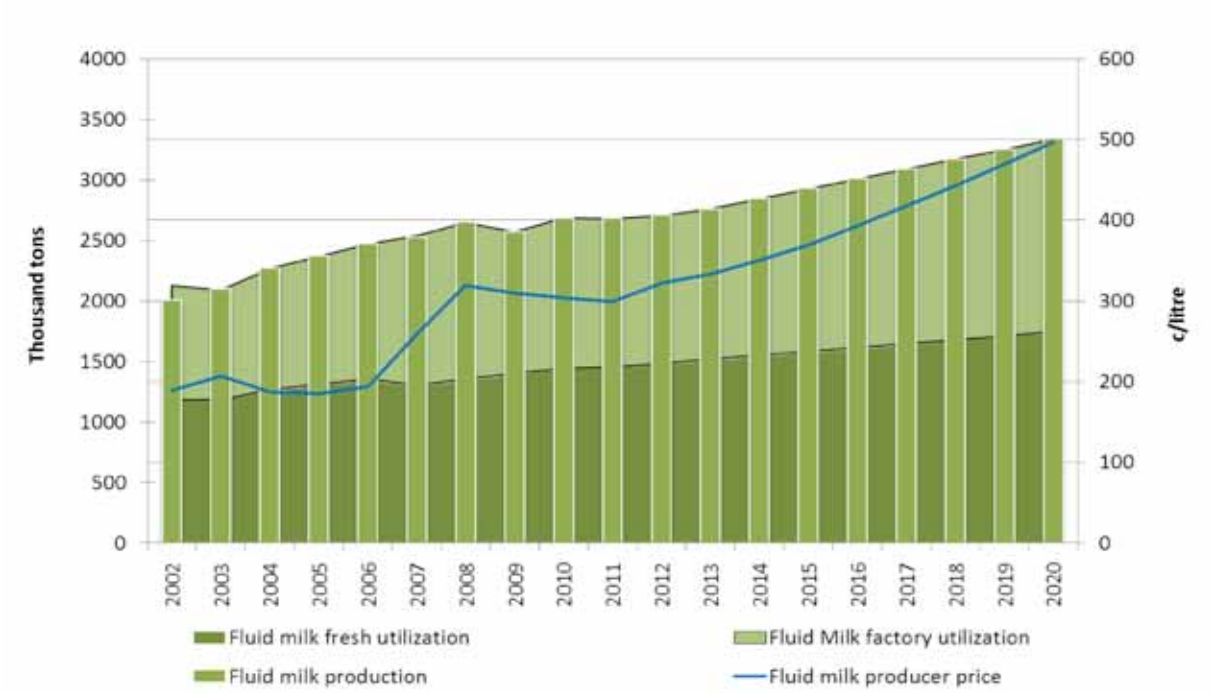


Figure 41: SA fluid milk production and utilisation

AFTER INCREASING ONLY MARGINALLY in 2011, the price of milk products is expected to increase more significantly in 2012, following improved demand and higher milk prices. The assumed depreciation of the Rand is expected to outweigh the world prices for dairy products. Although nominal prices are expected to increase over the baseline period, only cheese and skimmed milk powder are expected to increase at a rate greater than the expected inflation rate of 6 %, resulting in a 1.9 % and 3.9 % increase in real terms respectively. The price of butter and whole milk powder is expected to increase at an average of 5.9 % and 6.2 % per year respectively, resulting in prices remaining relatively constant in real terms.

Since the average economic growth rate over the baseline period is projected to be lower than the past decade, the growth in the demand for dairy products is expected to slow down to an annual average increase of 3.3 % per year, compared to 5 % over the past decade. Consumption of fresh milk is expected to increase at an annual average of 2.2 % per annum over the baseline period, compared to 2.5 % per annum over the past decade. By 2020, 3.3 million tons of milk (excluding the imports of dairy products) will be produced to match local consumption.

Over the next decade the growth in the consumption of skimmed milk power (SMP) is expected to increase slightly, with an average annual growth rate of 5.8 %, compared to 5.1 % in the past decade. Consumption of whole milk powder (WMP) is projected to soften, with an annual average growth rate of 4.0 %, compared to 8.7 % in the past decade. This changing consumption pattern can be ascribed to slower economic growth over the baseline period compared to the previous decade, leading to substitution of WMP with the cheaper alternative of SMP.

The consumption of cheese is projected to increase by 6.2 % per annum to reach approximately 108 000 tons by 2020. Butter consumption on the other hand is expected to decline by almost 1 900 tons. This decline is expected towards the end of the baseline. Butter can be substituted for cheaper alternatives such as margarine and in times of slower economic activity the use of butter declines, as is evident from decreased butter consumption in 2009 following record levels in 2007.

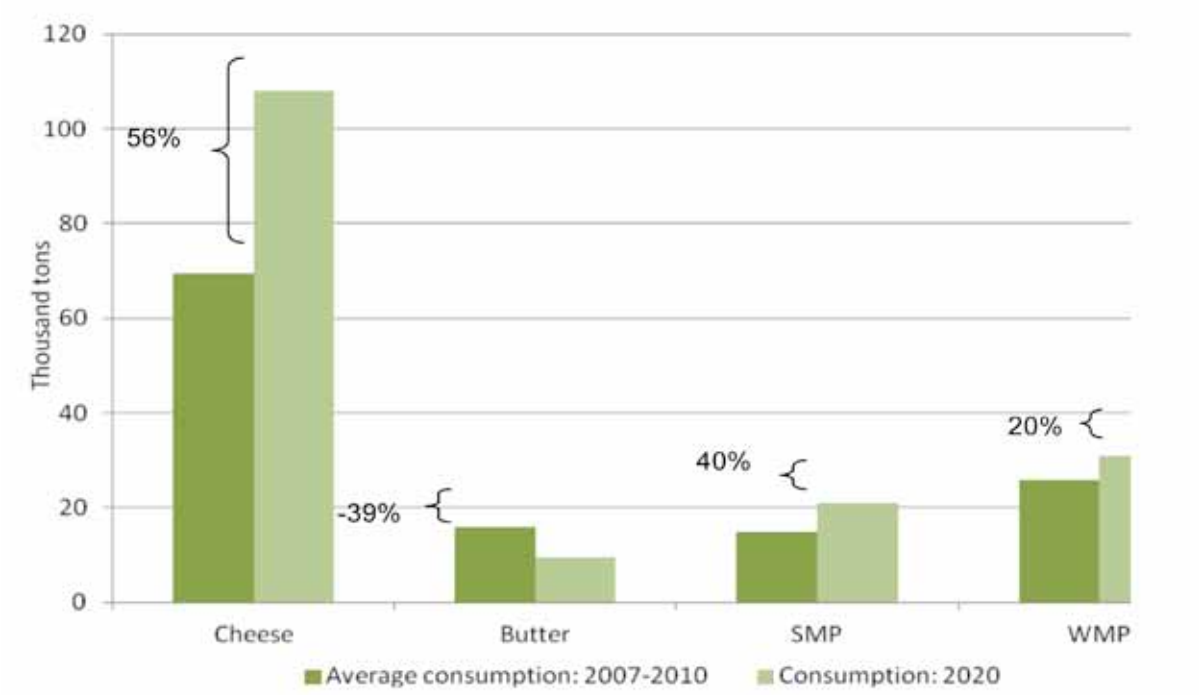


Figure 42: SA consumption of dairy products

BFAP BASELINE AGRICULTURAL OUTLOOK

potatoes

SINCE THE RECORD HIGH prices in 2009, potato prices have traded softer over the past two seasons in a relatively constant band of R23 to R26 per10 kg bag. The area under production has varied between 50 000 ha and 52 000 ha and the total area under production in 2012 is projected to come in at 52 980ha. Taking the increasing trend in yields into consideration, an all-time record harvest of 2.2 million tons is expected for 2012.

An annual average market price of R26.62 per 10 kg is projected for 2012. The sideways movement of prices with the anticipated increase in input costs are projected to result in a contraction in the area under production of approximately 1000 ha in 2012. Hence, a marked recovery of prices is anticipated in 2013 with prices likely to rise above R30 per 10kg.

Over the long run, market prices will not only be supported by the smaller crop, but also by a gradual improvement in real disposable income of consumers on the basis of an assumed slow but gradual recovery in the economy. The total area under potatoes will reach 53 600 ha by 2021 and with an average national crop yield of 48t/ha, total production is expected to rise to 2.58 million tons.

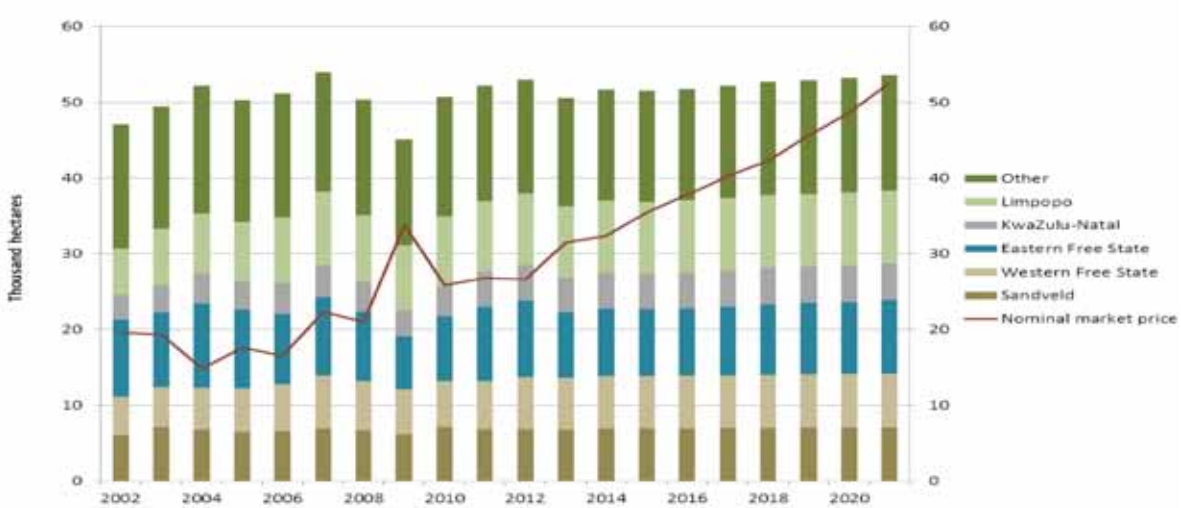


Figure 42: Potato area planted and average market prices

OVER THE LONG RUN, per capita consumption of potatoes is projected to increase by more than 20 %, which implies approximately 2.5 million tons of potatoes will have to be marketed by 2021. Over the period 2001–2011, the consumption of potatoes rose by 35 % from 1.3 million tons in 2001 to 2.1 million tons in 2011. In other words, under the macro-economic assumptions for this Baseline, the increase in per capita consumption of potatoes over the next ten years is unlikely to match the expansion in consumption over the past decade.

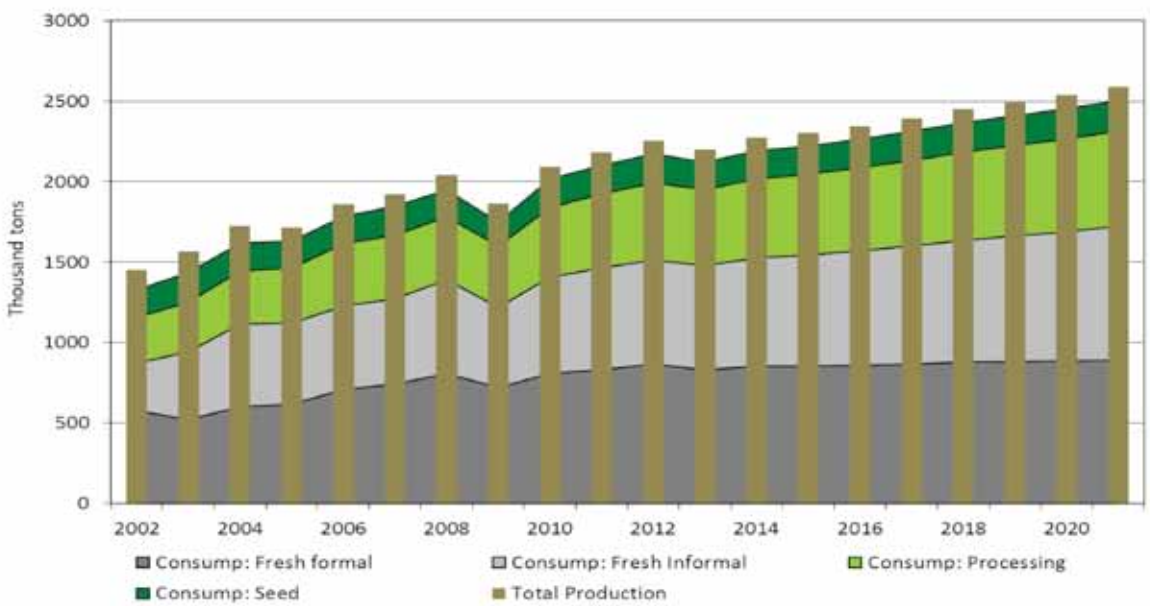
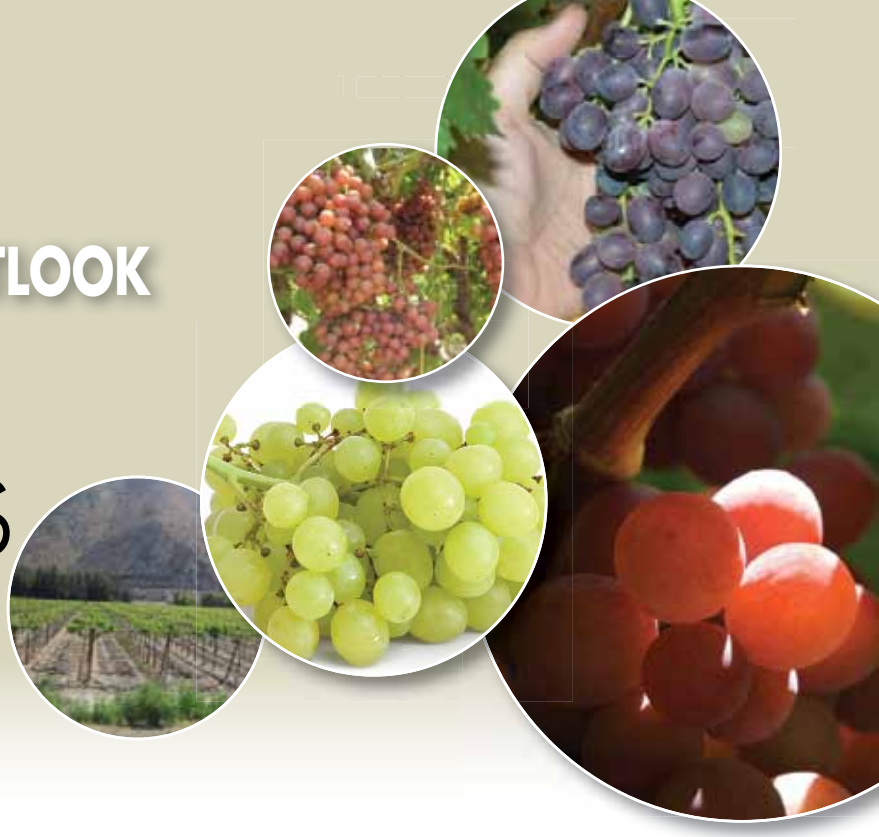


Figure 43: Potato domestic use

ALTHOUGH THERE IS A constant threat of imports of processed potatoes at competitive prices due to the relative strength of the Rand compared to the Euro, South Africa will remain a net exporter of potatoes over the long run, with approximately 145 000 tons being exported and 63 000 tons of processed potatoes being imported per annum.

BFAP BASELINE AGRICULTURAL OUTLOOK

table grapes



FOLLOWING THE RECORD SEASON of 2009/10, the total table and dried grape crop declined from almost 546 000 tons to below 446 000 tons in 2010/11. This is the third smallest crop in the past ten years and can be attributed to a decline in area planted, as well as lower yields caused by adverse weather conditions. Total area planted to table and dried grapes decreased from 23 172 ha in 2010 to 22 309 ha in 2011. Total area is projected to shrink to less than 22 000 ha in 2014, where after it is expected to increase steadily to reach 22 436 hectares in 2021.

TABLE GRAPES – EXPORT MARKET

THE SMALLER CROP OF 2010/11 led to a 12 % decline in fresh grape exports, with supply to the European market down by 16 %. Though Europe remains South Africa's most prominent export destination, it now accounts for less than 80 % of SA fresh grape exports. The low supply levels resulted in a 13 % increase in the average export price, from R13 662 per ton in the 2009/10 season to R15 467 per ton in 2010/11 (see Figure 44).

In response to the surge in prices the previous season and due to a relatively large crop this season, exports reached a record peak of 245 780 tons (or 55 million cartons) in the 2011/12 season, i.e. a 22 % increase from 201 500 tons in 2010/11. An oversupply in the market, together with quality issues, heavy snowfalls in Europe during end January/beginning February, Chile entering the European market about two weeks earlier compared to previous seasons and sluggish demand fuelled a decline in prices, especially in the South African mid-season. The average price earned for South African grape exports is simulated at R13 070 per ton for the 2011/12 season, 15 % down year-on-year. The older seeded varieties and exports from the Berg River and Hex River regions suffered the greatest losses.

Lower supply from South African and other southern hemisphere countries are expected to support prices in the 2012/13 season, with the average price projected to increase to R17 400 per ton. Assuming average yields, South African exports are expected to return to historical levels

of 224 000 tons in the 2012/13 season. Over the long run, export prices are projected to follow an increasing trend with an average annual increase of 6.7 % in nominal prices projected for the next decade. With a projected inflation rate of around 5%, prices are projected to increase on average by 0.5 % per year in real terms. This increase is mainly driven by an assumed depreciation in the value of the Rand. Other factors sustaining price growth include an assumed stabilisation in southern hemisphere exports and rising demand, with world population estimated to increase by about 600 million people over the next decade.

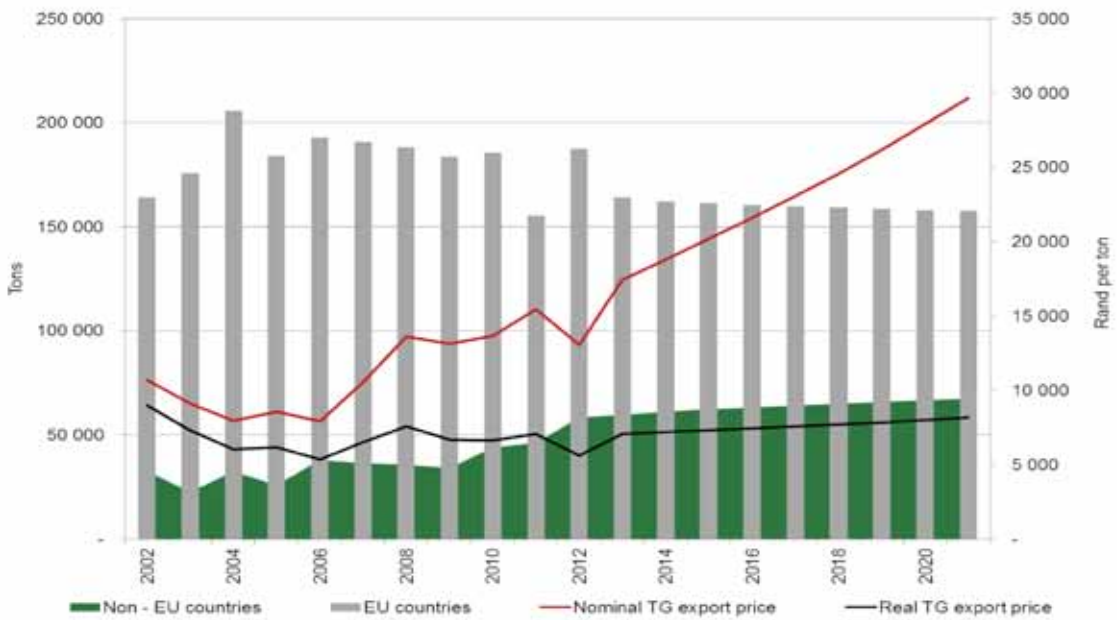


Figure 44: Export Market for SA fresh grapes

TABLE GRAPES - DOMESTIC MARKET

DEMAND FOR TABLE GRAPES in the domestic market remains strong as prices increased on average by 10 % in 2010/11 despite the 10 % increase in volume traded (Figure 45).

Supply to the local market is estimated slightly higher in 2011/12 compared to the previous season with price increases of roughly 6 %. Over the next decade, the domestic market is projected to remain lucrative with nominal price growth averaging 8.4 % per annum. However, returns in the local market still fall far short of the projected returns in the export market, ensuring that the volume marketed locally remains small relative to exports.

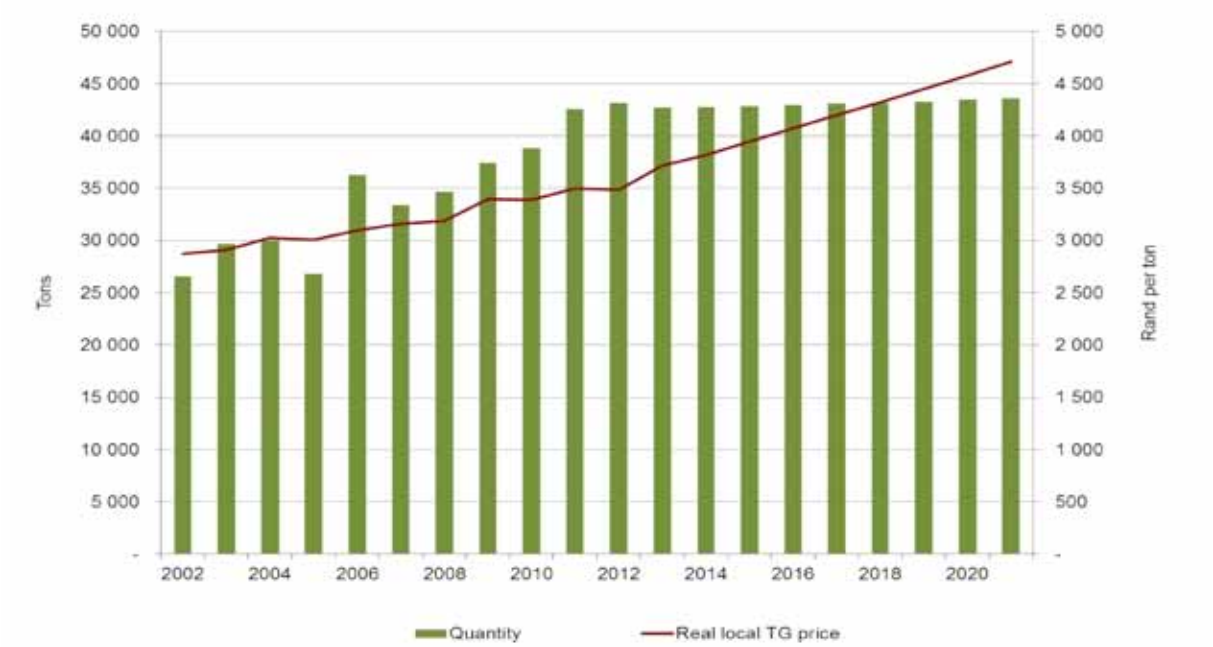
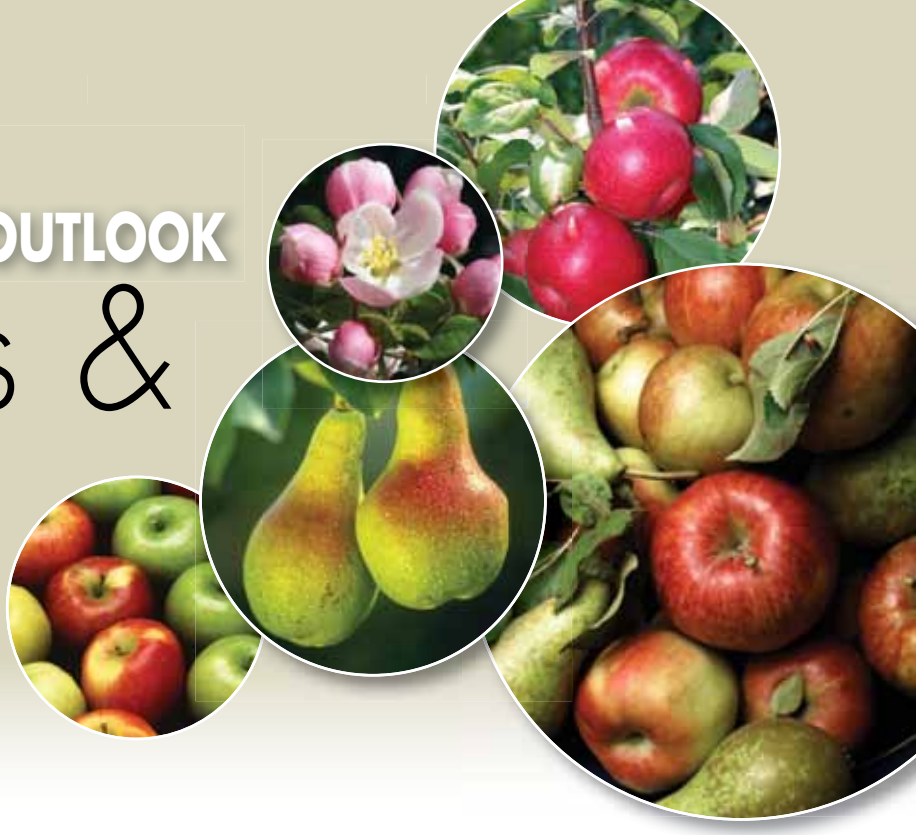


Figure 45: Local market for SA fresh grapes

BFAP BASELINE AGRICULTURAL OUTLOOK

apples & pears



THE AREA PLANTED TO bearing apple trees (i.e. trees four years and older) is projected to continue its upward trend, increasing by 470 hectares in 2012. Assuming average yields, total apple production is projected at 790 830 tons in 2012, up 3 % from the previous year. The upward trend in bearing acreage is projected to continue over the remainder of the baseline period with total bearing acreage projected at 20 853 hectares in 2021, up 1 141 hectares or 6 % from 2011. Production is projected to follow a similar increasing trend with total crop forecast at 830 000 tons in 2021.

The area planted to bearing pear trees is projected to increase by 215 hectares in 2012, following a 176 hectare increase in 2011. Over the remainder of the baseline period, bearing pear acreage is expected to remain fairly stable, with total area projected at 10 921 hectares in 2021, only 160 hectares more compared to 2011. The total pear crop is projected to fluctuate between 360 000 and 375 000 tons over the next ten years.

APPLES AND PEARS – EXPORT MARKET

THE AVERAGE PRICE FOR fresh apples exported in 2011 increased by 6 % year-on-year, despite total southern hemisphere exports peaking at 1 762 010 tons, the second largest supply from the southern hemisphere to date (Figure 46). The price increase can be attributed to lower northern hemisphere stock levels compared to the previous year, but also the continued shift in South Africa's export destination. The share of South African apples exported to Europe declined from over 60 % in 2006 to 41 % in 2011. The key growth area is Africa with exports to the continent increasing by 102 % over the past four years. In 2011, 24 % of total South African apple exports were destined for the African market.

Export prices are projected to jump on average by 16 % in 2012, from R6 434 per ton to R7 456 per ton, as a number of factors come into play. Southern hemisphere exports are estimated 7 % lower with indications of lower supply from Chile, Brazil and New Zealand; the Rand is trading weaker compared to last year, and opportunities

on the African continent are luring a greater share of South Africa's apple exports. An estimated increase in export volume from South Africa in the order of 3 % will boost returns to the industry this season.

Over the medium term, high supply levels, both from the southern hemisphere and also high stock levels in the northern hemisphere are projected to put prices under pressure. But as world economic growth gains momentum, increasing sales are expected to lift pressure on stock levels and stimulate trade, supporting prices. The improved demand conditions coupled with the assumed depreciating exchange rate are projected to generate price increases in the order of 2 % per annum in real terms from 2016 onwards (Figure 47).

In 2011, poor returns in the pear export market continued for the third consecutive year as exports from the southern hemisphere reached almost 788 000 tons. The average export price declined marginally from R6 377 per ton in 2010 to R6 312 per ton in 2011. Lower supply from the southern hemisphere and a weaker Rand are expected to ensure some price relief in 2012, with projected price gains in the order of 7 % year-on-year (Figure 46).

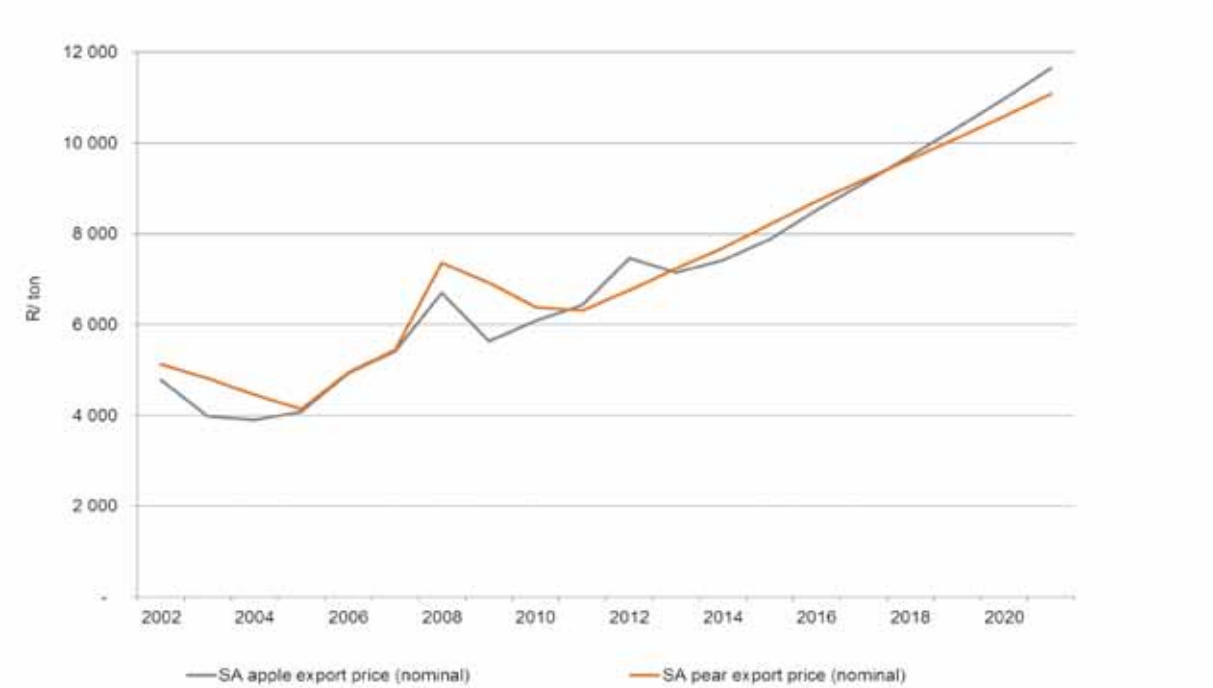


Figure 46: Rand return for SA exports: nominal prices

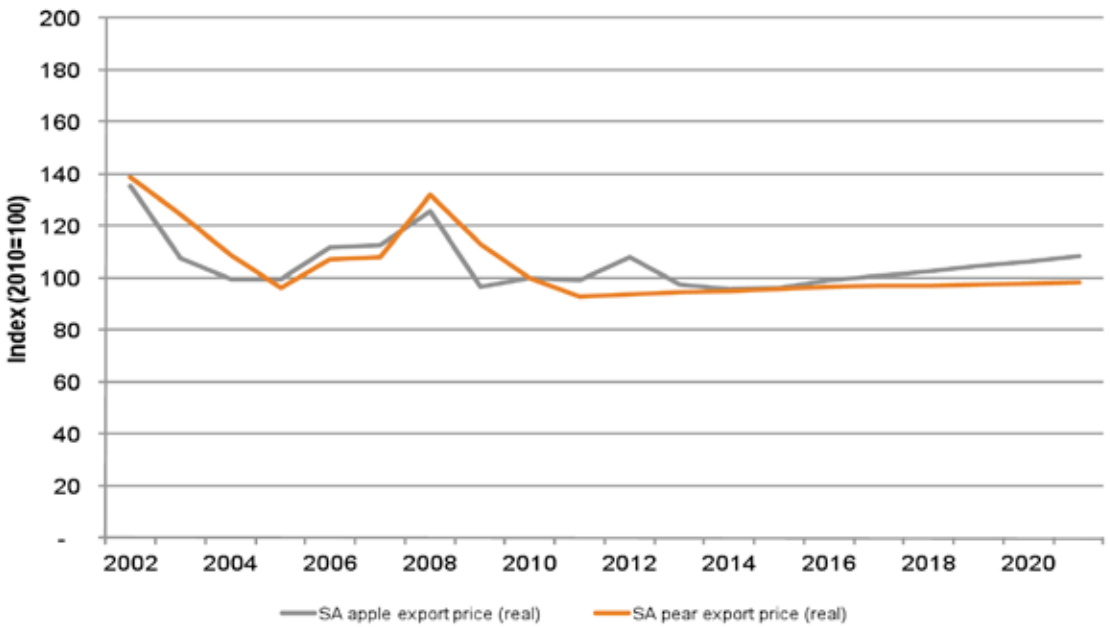


Figure 47: Rand returns for SA exports: real prices

OVER THE NEXT DECADE, increasing export supply from the southern hemisphere and relatively high European stock levels are projected to dampen price gains from the depreciating exchange rate, resulting in real prices increasing only marginally (Figure 47). Export supply from South Africa is projected to fluctuate between 170 000 tons and 180 000 tons over the baseline period. Europe remains the most important destination for South African pears, with 65 % of pear exports in 2011 destined for Europe. Demand in alternative markets is growing, with exports to the Far East and Asia increasing by 76 % from 2007 to 2011. The growth in the Middle East is even more impressive, with pear exports increasing by 196 % over the past four years. The share of exports to the Far East, Asia and the Middle East accounted for 24 % in 2011. The African market for pears is small, accounting for less than 2 % of South African exports.

APPLES AND PEARS – DOMESTIC MARKET

THE DOMESTIC MARKET FOR apples exceeded expectations in 2011, with a price increase of 18 % despite a 4 % increase in volume traded. It is unlikely that these price increases are sustainable over the long run and price increases are projected to soften over the next few years. The local market price for apples is simulated at R5 323 per ton for 2012, up 5 % from 2011. Prices are projected to remain under pressure in real terms up to 2014 as increasing supply is coupled with slow economic growth. From 2015 onwards stabilising supply levels and economic growth rates around 4 % are projected to provide some stimulus to prices leading to real price gains in the order of 2 % (Figure 48).

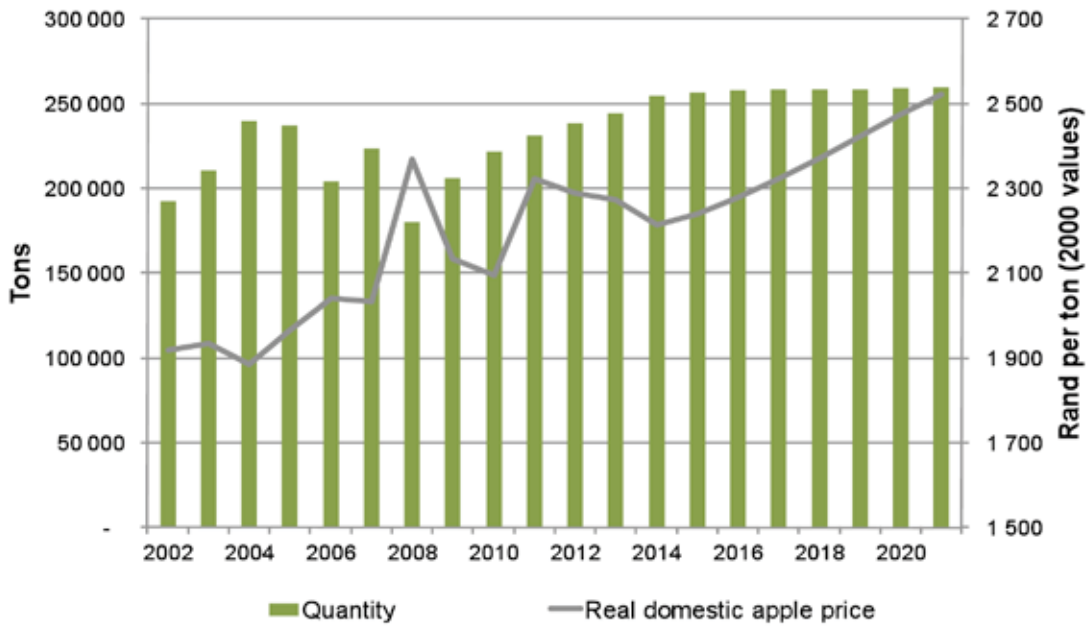
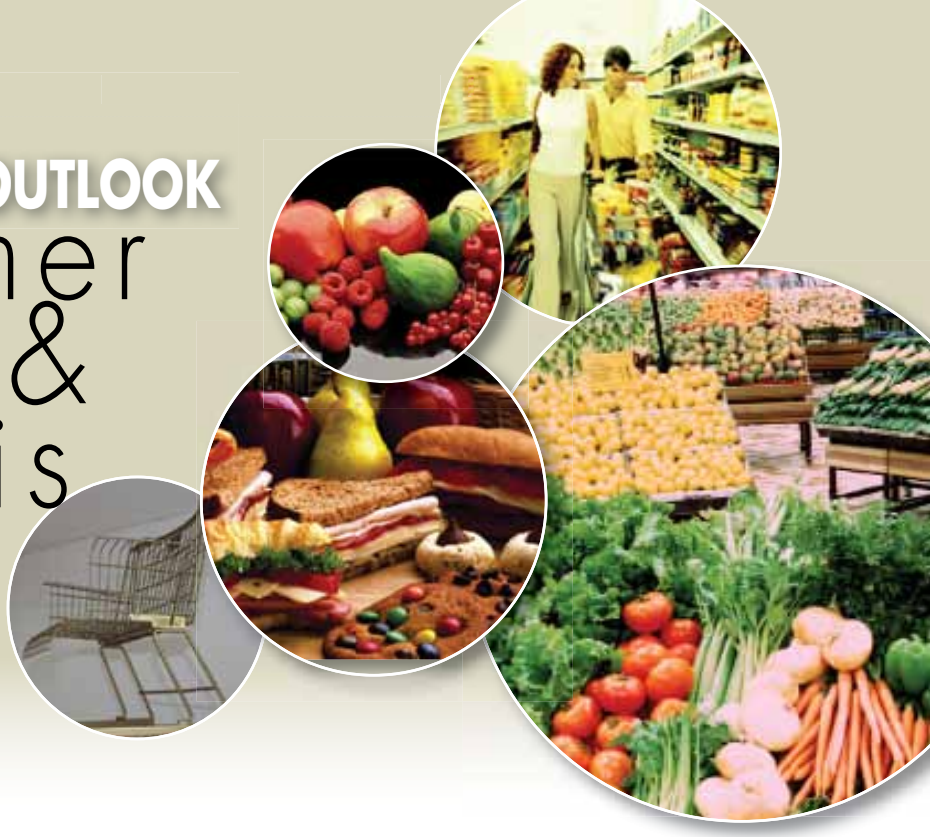


Figure 48: Local market for SA apples

THE DOMESTIC MARKET FOR pears remains small, below 70 000 tons. The price of pears sold locally is estimated to increase by 7 % in 2012, supported by lower supply and relatively high prices for processing pears. The price of fresh pears sold locally is projected to trade sideways over the next three years as low economic growth rates hinder growth in demand. Over the latter part of the baseline period, stronger economic growth together with increasing population are projected to stimulate demand for fruit, pushing prices upwards with real gains in the order of 2 % per annum.

BFAP BASELINE AGRICULTURAL OUTLOOK

consumer trends & analysis



INTRODUCTION

FOOD INFLATION SPEAKS TO the issue of food security in terms of food affordability, specifically for low income households. This chapter is divided into two sections. The first gives an overview of food inflation over the past five years by comparing three food inflation indices. This section serves to substantiate the importance of understanding and projecting food price inflation and food affordability in South Africa. The second is a projection of inflation on maize meal and bread, which can be considered the main calorie intake of low income households in South Africa. This chapter therefore serves as a starting point for BFAP to move into the projection of consumer dynamics and monthly food prices. Historically, the focus of the consumer section in the baseline was to provide context to the outlook for the various agricultural commodities and products. This year, monthly projections for maize meal and bread prices are included.

A HISTORICAL VIEW ON FOOD INFLATION IN SOUTH AFRICA

THE HISTORY OF FOOD inflation in South Africa is presented in this section based on three food price index measures for the period January 2008 to April 2012: the official Consumer Price Index for Food (CPIF), the 'basic food basket' index and the 'BFAP Poor man's' index. The methodologies behind these three food price indexes are explained in more detail below.

The official CPIF is based on an extensive list of food products within the following categories (number of indicator products in each category indicated in brackets): Bread and cereals (15), meat (23), fish (7), dairy (16), eggs (1), fats and oils (4), fruit (8), vegetables (30), sugar, jam, honey, chocolate and confectionery (6), other food products (e.g. sauces, condiments, baby food) (15), coffee and tea (3), mineral waters, soft drinks and juices (5). The CPIF gives an indication of food inflation as experienced by the 'average' consumer in South Africa and is calculated based on expenditure weights obtained through the 2005/2006 Statistics South Africa Income and Expenditure Survey. This data series was obtained from the South African Reserve Bank (KBP7145N, seasonally adjusted, with data available up to January 2012).

In order to develop an understanding of poorer

consumers' inflation experience and impacts, the 'basic food basket' index and the weighted '5 most commonly consumed food items' index were included in this discussion. The historical time frame for the calculation of these index values was selected based on the availability of monthly food price data. The 'basic food basket' index as a measure of food inflation is used in the quarterly Food Price Monitor publications of the National Agricultural Marketing Council (NAMC) (refer to www.namc.co.za for more detail), as well as the annual Food Cost Review published by the NAMC.

The 'basic food basket' index reflects the cost of a food basket comprising of basic food items and is largely based on the food items that were selected by the Food Price Monitoring Committee in 2003, based on their opinion of the dominant food items purchased by middle income to poor consumers[1] (NAMC, 2004:43). This index was calculated from the official food price database used by the NAMC for food price monitoring activities.

Table 3: Food items included within the 'basic food basket' index

Category:	Number of indicator products:	Products:
Bread & cereals	5	White bread (700 g loaf) Brown bread (700 g loaf) Super maize meal (5 kg) Special maize meal (5 kg) Rice (2 kg)
Meat	3	Fresh chicken (1 kg whole fresh chicken) Frozen chicken (1 kg whole frozen chicken) Stewing beef (1 kg beef chuck)
Fish	1	Tinned fish
Dairy	1	Long life full cream milk (1 litre)
Eggs	1	Extra-large eggs (1.5 dozen)
Oils and fats	3	Sunflower oil (750 ml) Brick margarine (500 g) Peanut butter (400 g)
Fruit	3	Apples (1 kg) Bananas (1 kg) Oranges (1 kg)
Vegetables	5	Onions (1 kg) Cabbage (1 kg) Potatoes (1 kg) Tomatoes (1 kg) Tinned butter beans (410 g)
Coffee & tea	2	Instant coffee regular (750 g) Ceylon tea (tagless tea bags 62.5 g)

THE 'BFAP POOR PERSON'S INDEX' was developed based on poor South African consumers' typical portion sizes of the five most widely consumed food items: maize porridge, brown bread, sugar, tea and full-cream milk (National Food Consumption Survey - Steyn & Labadarios, 2000[2]; Oldewage-Theron et al., 2005[3]; National Food Consumption Survey – Nel & Steyn, 2002[4]). The term 'most widely consumed' means that these food items are consumed by the largest share of South African adults according to the National Food Consumption Survey and other similar studies among poor South African consumers. The BFAP Poor Person's Index was calculated by weighing the food price data for these food items based on the typical (cooked) daily portions of very poor consumers (as obtained from the various nutritional studies listed above), in order to calculate the cost of a 'typical daily food plate' for the poor. This index was calculated based on the official food price database used by the NAMC for food price monitoring activities.

Table 4: Composition of the BFAP Poor Person's Index

Category:	Products:
Bread & cereals	Maize porridge (532 g cooked portion), Brown bread (150 g portion)
Dairy	Full cream milk (56 g portion)
Sugary foods	White sugar (22 g portion)
Hot beverages	Tea (2.5 g dry tea portion)

A comparison of the the official Consumer Price Index for Food (CPIF), the 'basic food basket' index and the 'BFAP Poor Person's Index are presented in Figure 49 below based on monthly data for the period January 2008 to April 2012.

From January 2008 to the present, food inflation in South African has been characterised by roughly three phases, as based on the CPIF (but closely reflected by the other two food price indices):

1. Significant food inflation from January 2008 to mid-2009

(+19 % on CPIF; +24 % on 'basic food basket' index; +21 % on BFAP Poor Person's Index)

In actual value terms, the cost of the basic food basket increased from R327 to R405 during this period, while the cost of items within the BFAP Poor Person's Index increased from R2.57 to R3.10 per person per day.

During this period, the major contributors to food inflation within the basic food basket (with above 10 % price increase) were rice (+93 %), instant coffee (+65 %), cabbage (+57 %), margarine (+48 %), butter beans (+46 %), peanut butter (46 %), tinned fish (+45 %), bread (+34 %), eggs (+30 %), Ceylon tea (+26 %), onions (+25 %), tomatoes (+20 %), super maize meal (+14 %) and beef chuck (+12 %). The food items with significant price inflation mostly involved food types that typically add dietary diversity to consumers' food intake and thus could have had a significantly negative impact on dietary diversity of especially poorer consumers. Among the staple foods, bread experienced the highest inflation, followed by super

[1] National Agricultural Marketing Council (2004) Food Price Monitoring Report 2004. www.namc.co.za

[2] Steyn NP, Labadarios D. National Food Consumption Survey: Children aged 1–9 years, South Africa, 1999. Cape Town: The Department of Health Directorate Nutrition, 2000.

[3] Oldewage-Theron W, Dicks E, Napier C et al. Situation analysis of an informal settlement in the Vaal Triangle. Development Southern Africa 2005 ; 22 (1): 13-26.

[4] Nel JH & Steyn NP. Report on South African food consumption studies undertaken amongst different population groups (1983-2000): Average intakes of foods most commonly consumed. The Department of Health Directorate Food Control, 2002.

maize meal, which explains the observation that the weighted '5 most commonly consumed food items' index generally had higher index values relative to the other two indexes, as maize porridge and bread dominate the poor consumers' 'food plate' as explained above. During this period, high food price inflation was observed for 5 of the 10 most commonly consumed food items by South African adults (Nel & Steyn, 2002:49), namely coffee, margarine, bread, tea and maize meal.

2. Relatively stable food prices from mid-2009 to October 2010

3. Significant food inflation from October 2010 to January 2012

(+13 % on CPIF and +19 % on basic food basket; +24 % on BFAP Poor Person's Index)

In actual value terms, the cost of the basic food basket increased from R397 to R467 during this period, while the weighted food plate of '5 most commonly consumed food items' increased from R3.36 to R3.79 per person per day.

During this period, the major contributors to food inflation within the basic food basket (with above 10 % price increase) were super maize meal (+100 %), oranges (+78 %), cabbage +32 %), peanut butter (+31 %), bananas (+30 %), margarine (+27 %), special maize meal (+26 %), sunflower oil (+23 %), beef chuck (+22 %), instant coffee (+17 %), bread (+15 %), butter beans (+13 %), fresh whole chicken (+11 %), tinned fish (+11 %). High food price inflation was observed for 5 of the 10 most commonly consumed food items by South African adults (Nel & Steyn, 2002:49[5]), namely maize meal, margarine, coffee, bread and chic-ken. The inflation experienced by poorer consumers (as measured by the basic food basket index and the weighted '5 most commonly consumed food items' index) was more severe than the trend of the CPIF, mainly attributed to the significant inflation on staple foods (maize meal and bread). The spike in the weighted '5 most commonly consumed food items' index around late 2010 and early 2011 can be attributed to particularly high bread prices during these months.

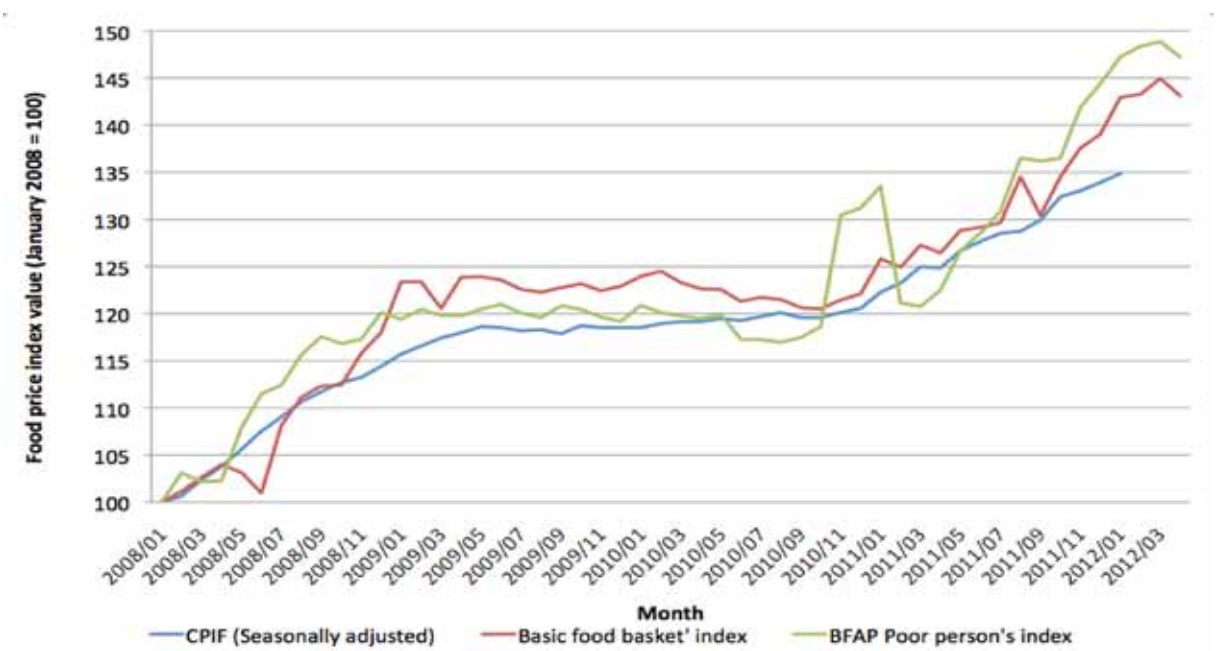


Figure 49: Monthly food price inflation in South Africa (January 2008 = 100)

[5] Nel JH & Steyn NP (2002) Report on South African food consumption studies undertaken amongst different population groups (1983-2000): Average intakes of foods most commonly consumed. The Department of Health. Pretoria.

ANALYSING THE IMPACT OF FOOD INFLATION ON THE POOREST HOUSEHOLDS IN SOUTH AFRICA

IN ORDER TO EXPLORE the impact of inflation on basic food items on poor consumers in South Africa, the cost of the basic food basket can be expressed as a share of the average monthly income of the poorest 30 % of the population (i.e. Income Deciles 1 to 3 and described in StatsSA's Income & Expenditure of households 2005/2006 (values exclude imputed rent on owned dwelling). During the time of the StatsSA survey (2005/2006) the average monthly income of income deciles 1 to 3 was R1 132 per month, compared to an average value of R14 282 for the wealthiest 30 % of the population at the same period. These figures were then increased by the actual percentage growth in household personal disposable income (South African Reserve Bank data series KBP6246J) during this period to allow for income growth within these income brackets over the analysis period.

From January 2008 to April 2012 the cost of the 'basic food basket' expressed as a share of average monthly household income of income deciles 1 to 3 increased by 11.9 %, from 20.8 % to 23.6 %. From January 2008 to April 2012, the cost of the 5-item food plate of the BFAP Poor Person's Index, expressed as share of the estimated average monthly income of individuals within income deciles 1 to 3, increased by 14.5 % from 14.7 % to 17.2 %.

As with the 'basic food basket' approach, these results suggest that the food inflation rates on the five most widely consumed food items were higher than the growth of households' personal disposable income during the analysis period. Furthermore, the impact was even more severe in the context of the five foods most widely consumed by very poor consumers in South Africa.

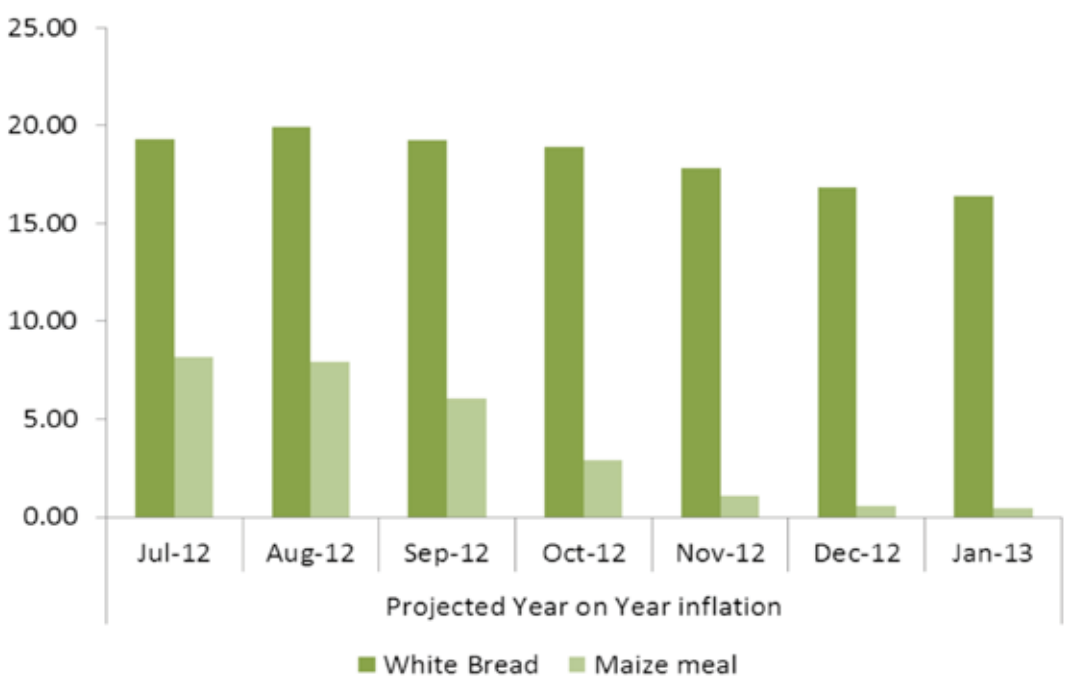


Figure 50: Monthly year on year projections for maize meal and white bread

AS CAN BE SEEN from the figure above, it is expected that there will be a drop in the year-on year inflation of maize meal, with prices moving sideways towards the end of 2012. This can be attributed to maize prices trading slightly lower than the same time last year. In contrast, fuel and electricity prices are higher, which is expected to support maize meal inflation from turning negative due to lower commodity prices.

With respect to bread, inflation is expected to decrease slightly towards the end of the year. Unlike the case of maize meal, it is however expected that there will still be significant inflationary pressures on bread due to wheat prices being relatively high compared to that of maize meal in the projection period. Another possible reason for the slower decline of bread inflation is that bread has a longer value chain than maize meal and is, as a result, much more exposed to institutional/regulated price increases such as electricity and fuel price hikes. It is therefore also difficult to rapidly adjust prices in the value chain. As a result, prices in this value chain can be considered asymmetric, in that input price increases (fuel, wheat, electricity, etc.) cause the price of bread to increase, but the opposite is not necessarily true.

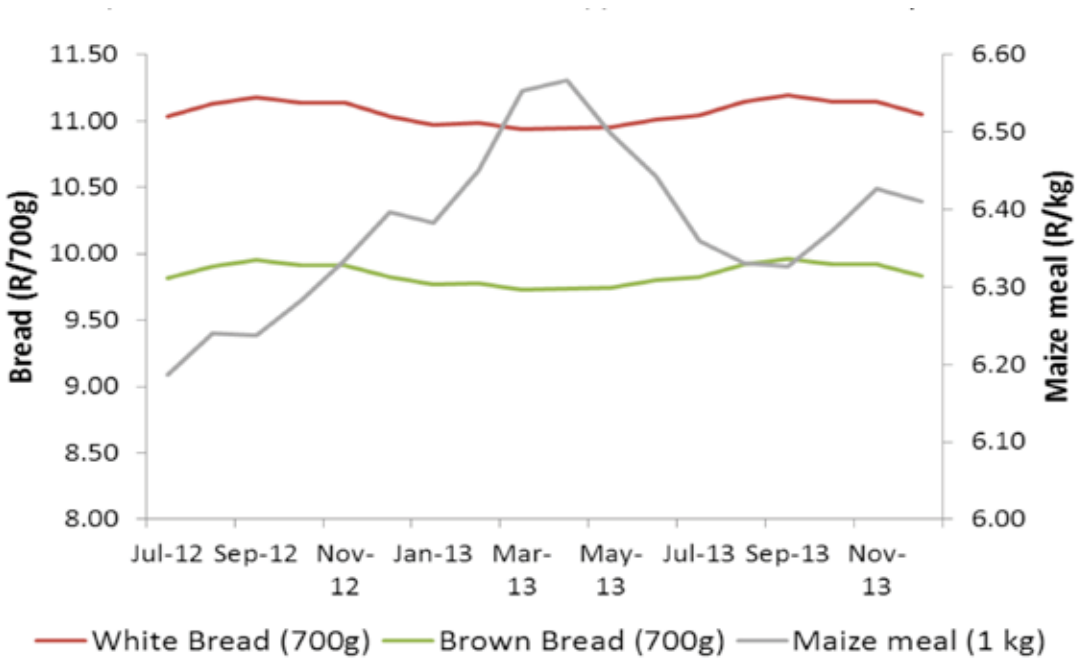


Figure 51: Projected monthly prices for white bread and maize meal

THE GRAPH ABOVE SHOWS what could be expected for bread and maize meal prices over the next 18 months, given slightly lower fuel and grain prices expected towards the middle of 2013. As mentioned above, it is expected that increasing electricity prices and other possible inflationary pressures, caused by increased regulated prices, will support the price of bread and maize for the remainder of 2012 and 2013. Prices for bread are therefore expected to move sideways between R9,50 and R10,00 per loaf of brown bread and between R10,50 and R11,00 for a loaf of white bread. Maize meal price are expected to increase slightly towards mid-2013, attributable to world prices of maize pushing local maize prices higher. Maize meal prices are projected to decrease somewhat in the second half of 2013. This projection is based on a favourable South African harvest driving local maize prices lower, given favourable weather conditions in the 2012-2013 p roduction season.

THE PROJECTED IMPACT ON POOR CONSUMERS

A HISTORICAL VIEW ON the BFAP Poor Person's Index was presented in Figure 49. The graph above shows the year on year and month on month inflation projections for the BFAP Poor Person's Index with a specific focus on brown bread and maize meal prices. Even though the projected maize meal and bread prices are weighted by typical portion sizes, it corresponds to the year on year bread and maize meal projections in Figure 50, due to the large share that these two products make up in the daily diet of a poor consumer – e.g. in April 2012 the cost of the maize meal and bread components within this 'food plate' was around 80% of the total cost of the five portions. The high inflation, as depicted above, is predominantly driven by high bread prices It is therefore expected that the BFAP Poor Person's Index will decrease slightly in the first months of the projection period after which it will be supported at a level of around 10% (year on year) inflation for 2013. Food affordability might therefore still be under pressure in the coming months.

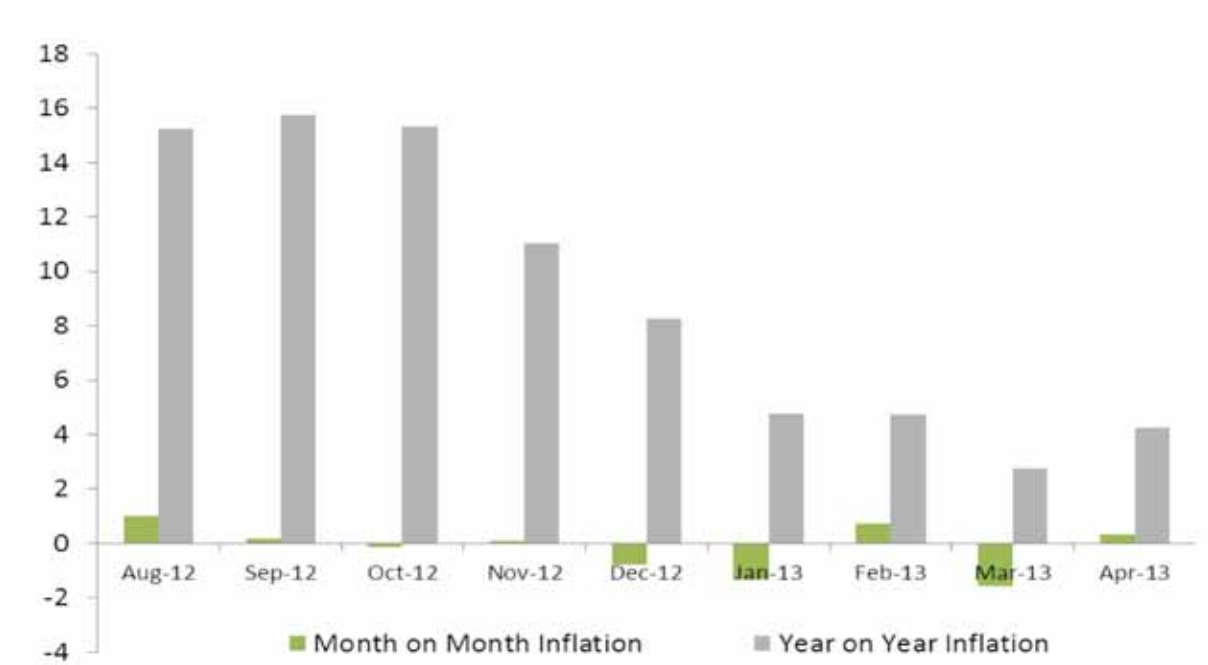
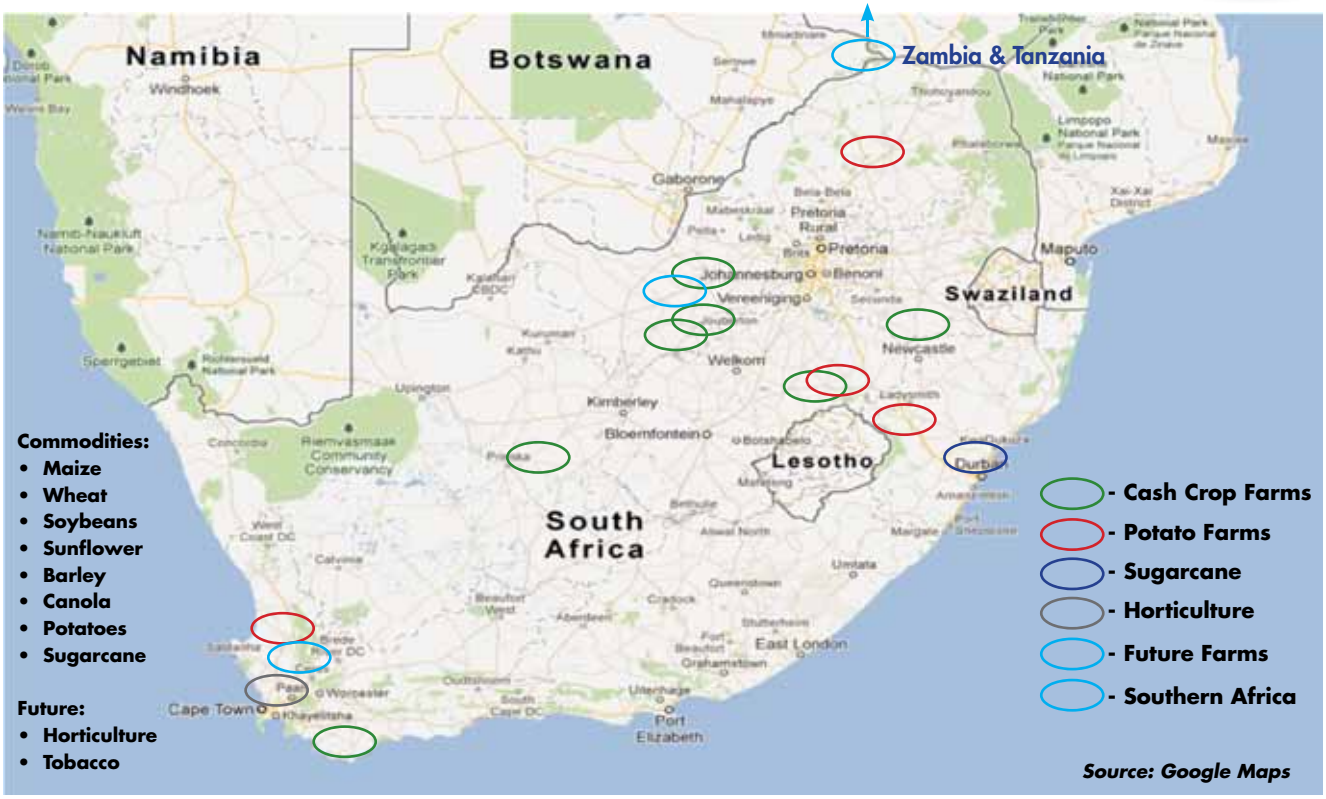


Figure 52: BFAP Poor Person's Index projections (August 2012 to April 2013)

BFAP BASELINE AGRICULTURAL OUTLOOK

farmlevel analysis



INTRODUCTION

THE VOLATILE NATURE OF the agricultural environment led to new extremes in the last production season, mainly influenced by key macroeconomic drivers in both primary production of agricultural products and throughout the entire value chain. Fluctuations in especially commodity and input markets created a new framework or set of challenges under which farmers have to adjust on a constant basis. The price of key commodities fluctuated throughout the year and was largely driven by weather conditions. The latter, especially the drought in the USA, generated an extremely sensitive platform on which these commodities were traded and therefore contributed largely to the volatile conditions. These changing conditions are a perfect example of how fast the agricultural environment can change.

The 2010/2011 production season varied across the key production regions. Figure 53 illustrates different maize yields of farms that are currently part of the BFAP farm-level programme.

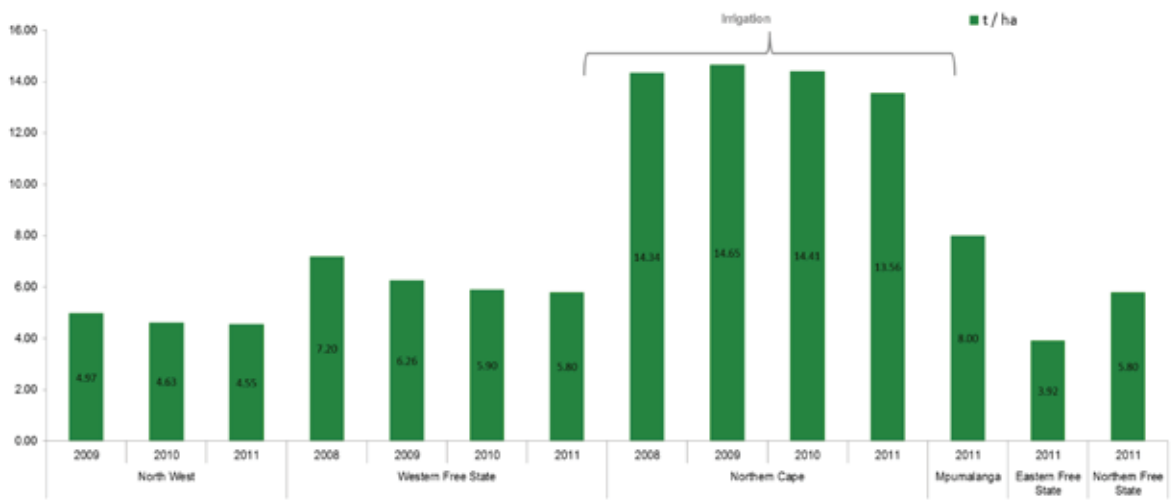


Figure 53: Maize yields in the key producing areas in South Africa

THE NORTH WEST AND western Free State regions both reported declining maize yield trends since 2008/2009. The average maize yield of the representative farms in North West and western Free State during 2011 was 4.55 and 5.80 tons per hectare respectively. Maize yields in the Northern Cape farm were relatively constant over the past four years. The average maize yield of the Northern Cape farm in the BFAP network was 13.56 tons per hectare in 2011. Three additional farms were added to the network during 2012. The Mpumalanga dryland farm reported a yield of eight tons per hectare (2011), and the eastern Free State farm 3.92 tons per hectare. The northern Free State farm followed the same trend as the western Free State region with a yield of 5.8 tons per hectare.

When considering agricultural inputs, the past year again accounted for sharp increases in some key production inputs. These increases were mainly influenced by a high oil price, a depreciating exchange rate against the US Dollar and other key macroeconomic- and political variables. The latter was further distorted by unrest conditions in oil producing countries and the economic crisis in the Euro zone.

The international oil price reported an increase of 20.66 % from January 2011 to May 2012. For the same period, the exchange rate depreciated by 13.23 % against the US Dollar. Both these variables significantly impacted the domestic price for agricultural fuel, which increased by 43 % from January 2011 to May 2012. The cost of fertiliser reported a similar increasing trend, with the domestic average cost of nitrogen and potassium increasing by 17.5 and 20 % respectively while the cost of phosphorus declined by 5.3 %and the price of KAN (28) and Potassium Chloride (granular) reported an increase of 19 and 21 % respectively (Grain SA, 2012).

THE IMPACT OF INCREASING INPUT EXPENDITURE ON DIFFERENT COMMODITY PRICE LEVELS – A STOCHASTIC APPROACH

AS STATED EARLIER, THE past production season was characterized by high commodity prices which portrayed a positive picture for various farm businesses in South Africa. Together with normal yields that prevailed during 2011, gross margins for grain- and oilseed enterprises were generally positive. At the same time, increasing input inflation raised concerns, especially for the cost of fuels and selective fertilisers, which further impacts all other agricultural input related variables. The question therefore arises whether the general performance of farm businesses could be maintained given the increasing trend in input expenditure. As stated earlier, volatile conditions in agricultural markets will continue, therefore markets and output prices can change instantly to less favourable levels. Therefore, what is the general state of farm businesses in selective areas and what might the future scenario look like given a certain set of macroeconomic drivers and policy assumptions?

In the following section, the impact of increasing input expenditure on farming units at different commodity price levels will be illustrated through a stochastic modelling approach.[6] The financial results are based on the BFAP FinSim model outcomes, which are integrated into the BFAP System

[6] A stochastic model contains the random nature or most likely impact, meaning that the random variables and relationships in the model will allow the output to enclose random elements or probability distributions (Strauss, 2005:15). Stochastic models and the random nature thereof incorporate risk by conveying probability distributions to specific exogenous and endogenous variables. Probability and cumulative distributions represent the simulation of key output variables in stochastic surroundings which quantify and compare risks that is associated in different scenarios and decisions.

of Linked Models. The FinSim model is a total budgeting model capable of simulating a farm business comprising of various enterprises and production systems. Apart from enterprise specifics, the model captures business specifics such as the asset structure and financing methods in terms of short, medium and long term liabilities. The aim of the BFAP system of linked sector and farm-level models is to provide quantitative analyses and projections of how different policy options, macroeconomic variables and uncertain market conditions will impact farm businesses, their suppliers and policy makers in selective production regions in South Africa.

NORTHERN CAPE – FARM BACKGROUND

FARMING UNITS IN THE Northern Cape irrigation region differ substantially. For the purpose of this exercise, an average farm unit size of 412 hectares under irrigation has been identified. The representative farm mainly produces yellow maize and wheat on a double cropping rotation. The baseline or current farm performance will be briefly illustrated in the first section. Thereafter, the baseline projections will be compared to a set of price scenarios which will illustrate the most likely impact of increasing input expenditure on farming units in the Northern Cape irrigation region.

The latest outlook from the BFAP sector model is applied in the FinSim farm-level model, in order to simulate baseline projections for the representative farm. Table 5 illustrates the key macro-economic and baseline indicators and projections for the period 2011 to 2018.

Table 5: Key baseline indicators and projections (2011 – 2018)

Key Outcome Variables	2011	2012	2013	2014	2015	2016	2017	2018
Yellow Maize Price Index (%)		123	125	116	121	124	127	130
Wheat Price Index (%)		106	111	112	114	117	120	124
Fuel Cost Index (%)	100 - Base year	140	136	146	148	151	152	151
Fertiliser Cost Index (%)		97	104	106	108	109	108	107
Electricity Cost Index (%)		106	112	119	125	131	137	144

THE CURRENT BASELINE INDICATORS and projections indicate that despite of the recent reduction in the price of diesel, the average price at which the 2013 summer crop will be planted towards the end of 2012, will be significantly higher than a year ago. The general consensus is that the cost of other inputs such as fertilisers will increase marginally over the baseline period.

The costs of irrigation electricity are projected to increase by 44 % over the baseline period. Given the projections of commodity prices over the period, it is apparent that farming units will experience cost pressure in the long run, and the best way of handling costs pressure is by means improved efficiency. Given the assumptions and projections of Table 5, the current state of the representative farm will be illustrated by a set of key financial and performance indicators. Thereafter, the current farm condition and projections will be compared to a set of different commodity price levels to illustrate the impact of increasing input expenditure over the long run.

THE BASELINE / CURRENT STATE OF FARM BUSINESS

FIGURE 54 ILLUSTRATES selective direct allocated costs for maize production in the Northern Cape.

- It is projected that the cost of fertiliser will increase marginally towards 2018. The baseline projections indicate that the cost of fertiliser per hectare could increase from R4 850 in 2011 to R5 167 per hectare by 2018. This is mainly due to the assumption of a stagnant oil price over the baseline period, especially from 2015 and onwards.
- The cost of fuel could increase by 51 % which means that farmers in this region could spend more than R900 per hectare by 2018.
- Irrigation electricity in 2018 could reach almost R2 000 per hectare.

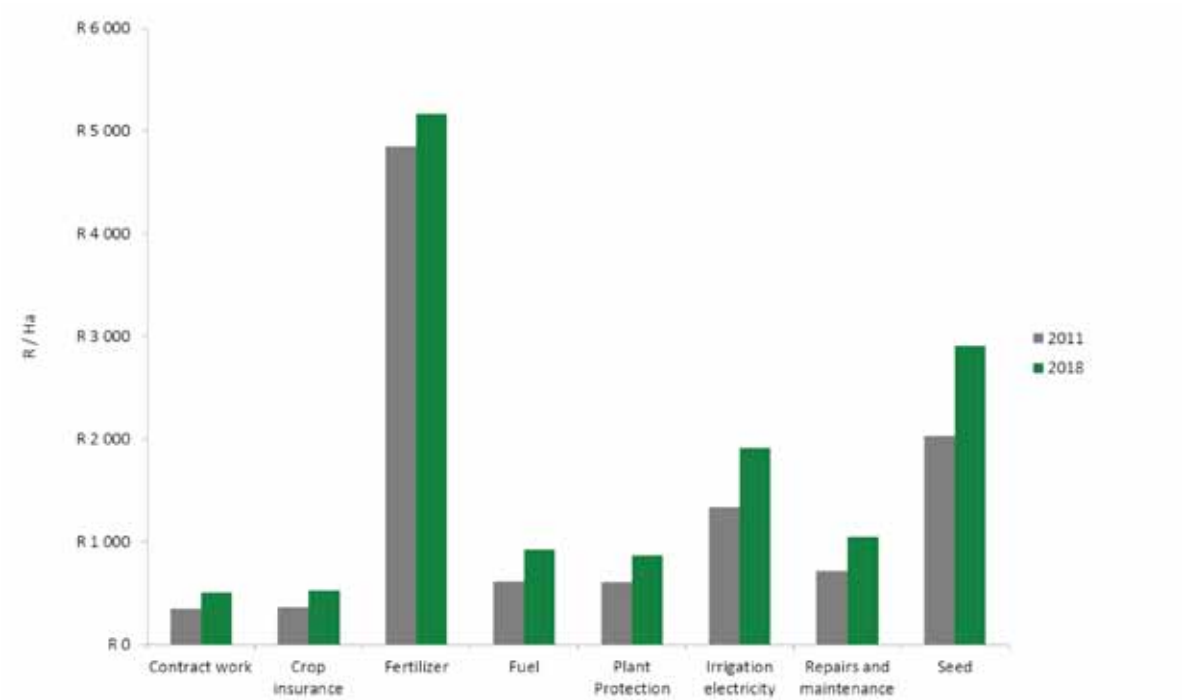


Figure 54: Selective direct allocated cost: Maize (2011 & 2018)

FIGURE 55 ILLUSTRATES A selection of variable costs for wheat production in the Northern Cape region.

- The cost of fertiliser could increase from R4 350 to R4 634 per hectare by 2018.
- Fuel variable cost in 2011 was roughly R697 per hectare. The current projections indicate that this could increase to R1 050 per hectare by 2018.
- Irrigation electricity costs could increase to R1 895 by 2018.
- At the current input inflation, the total direct allocated cost for wheat could reach R12 119 per hectare by 2018.

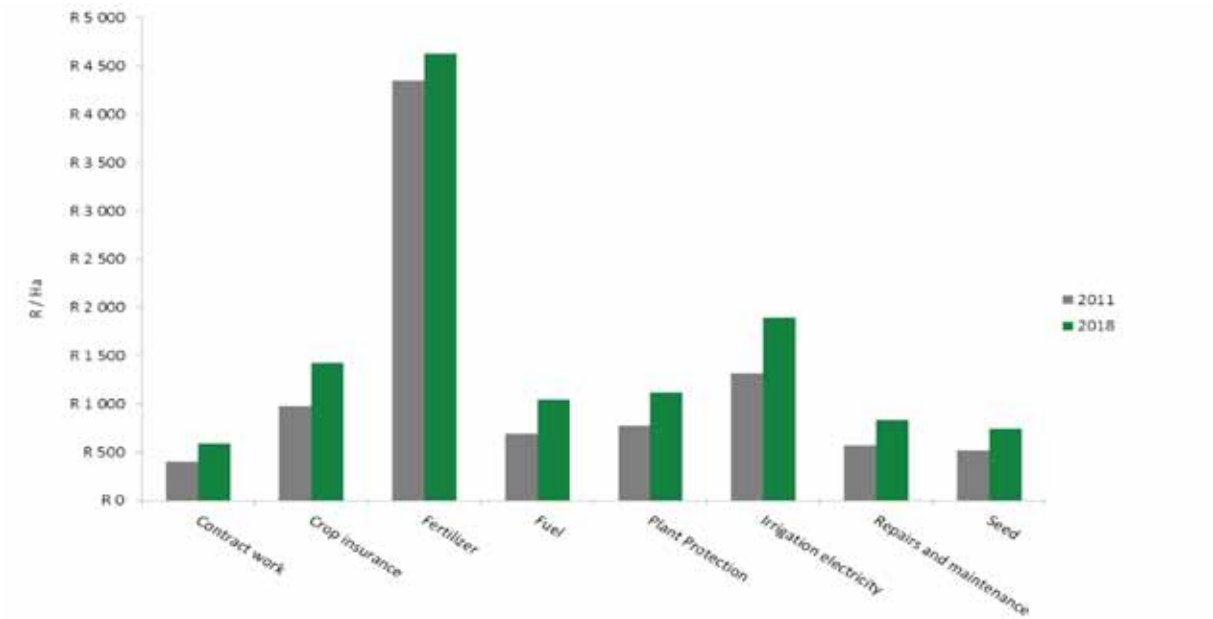


Figure 55: Selective direct allocated cost: Wheat (2011 & 2018)

FIGURE 56 REPRESENTS THE gross margin per hectare for maize and wheat production in the Northern Cape.

- The graph indicates wheat production will be more profitable than maize production, mainly due to exceptionally good wheat yields in this region.
- The profitability of maize production could decline from 2012 to 2014 due to a relatively stable yellow maize price but increasing input expenditure.
- Wheat profitability could gradually increase from 2013 towards 2018.

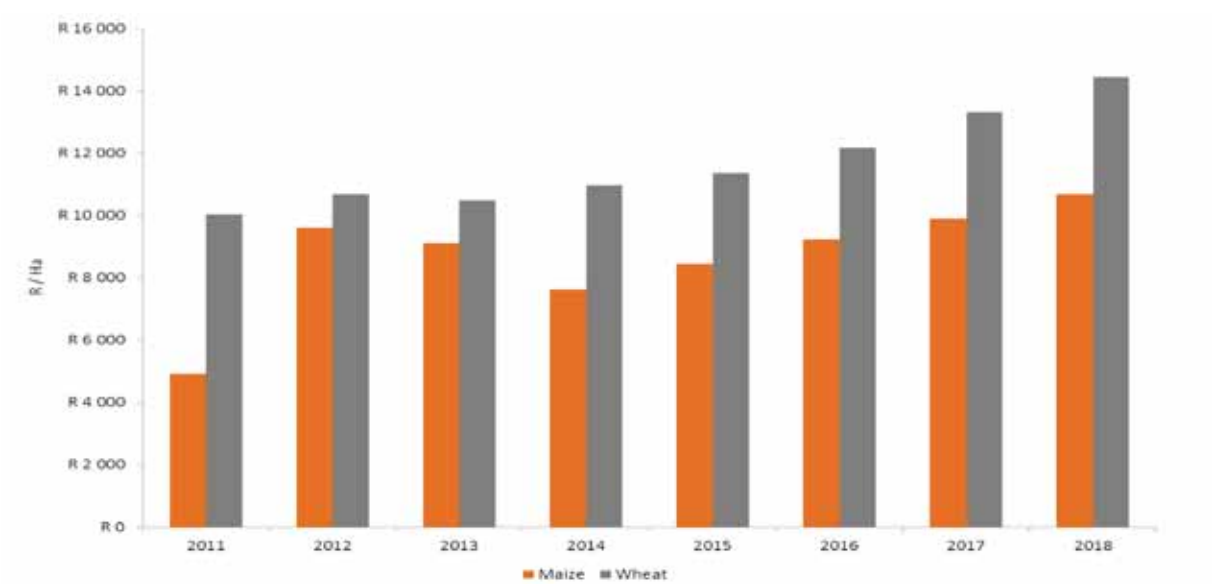


Figure 56: Gross margin projections, maize & wheat (2011-2018)

FIGURE 57 ILLUSTRATES THE Net Farm Income (NFI) for the baseline period. The current projection is that NFI will increase dramatically from 2011 to 2012. Towards 2014, a decrease could occur due to a stagnant maize price but more expensive inputs. It is further projected that from 2014 and onwards, NFI will gradually increase to the end of the baseline period. Given an above average yield of 13 tons per hectare for maize and 8.44 tons per hectare for wheat, together with commodity prices of R1677 and R2086 per ton for maize and wheat respectively, a NFI of above R3.5 million is expected for 2012. Thereafter, NFI could decrease by more than 20 % towards 2015.

Tables 6.a and b represent the sensitivity analysis for maize and wheat production in the Northern Cape region. The column at the top of the table represents different yield levels. The left of the table represents different price levels. The rest of the content indicates the different gross margin levels per hectare at different price and yield combinations. The red areas further identify at what price and yield combination the farm business will not meet the required input cost per hectare. The yellow areas identify a marginal gross margin. Finally, the green areas indicate where the farm business will make a positive gross margin per hectare. It should be noted that the overhead cost component of the farm is not included in the sensitivity analysis.

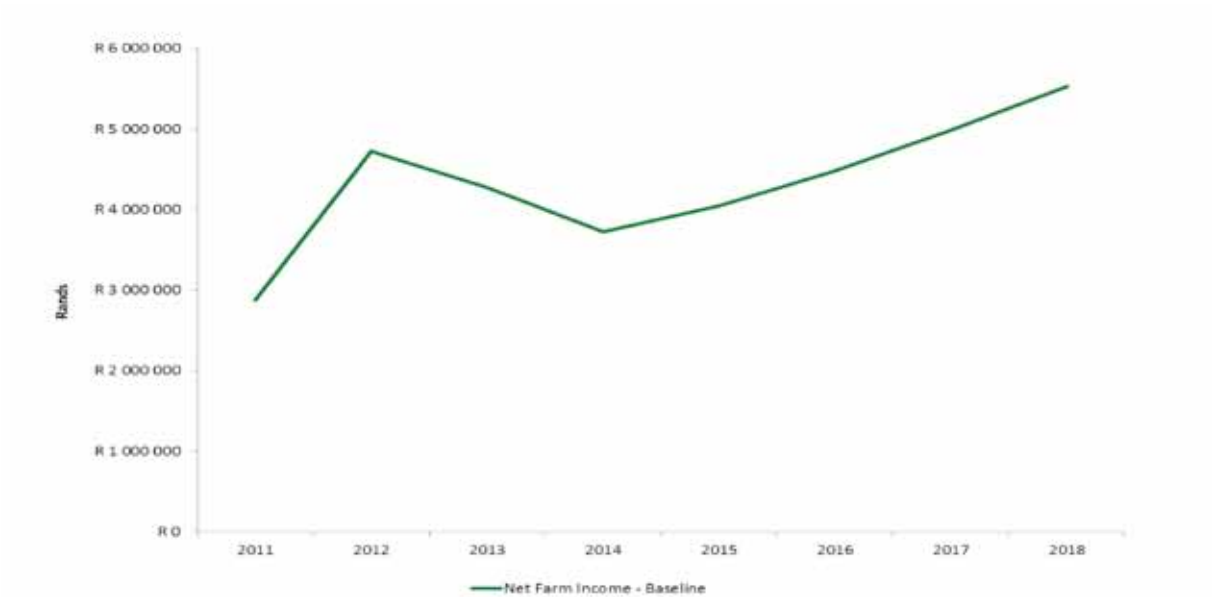


Figure 57: Net farm income projections: 2011 - 2018

Table 6.a: Sensitivity analysis for maize production in the Northern Cape

	Yield (T / Ha)						
Farm gate price (R / Ton)	**6**	**7**	**8**	**9**	**10**	**11**	**12**
R 1,100	-R 5,228	-R 4,128	-R 3,028	-R 1,928	-R 828	R 272	R 1,372
R 1,200	-R 4,628	-R 3,428	-R 2,228	-R 1,028	R 172	R 1,372	R 2,572
R 1,300	-R 4,028	-R 2,728	-R 1,428	-R 128	R 1,172	R 2,472	R 3,772
R 1,400	-R 3,428	-R 2,028	-R 628	R 772	R 2,172	R 3,572	R 4,972
R 1,500	-R 2,828	-R 1,328	R 172	R 1,672	R 3,172	R 4,672	R 6,172
R 1,600	-R 2,228	-R 628	R 972	R 2,572	R 4,172	R 5,772	R 7,372
R 1,700	-R 1,628	R 72	R 1,772	R 3,472	R 5,172	R 6,872	R 8,572
R 1,800	-R 1,028	R 772	R 2,572	R 4,372	R 6,172	R 7,972	R 9,772
R 1,900	-R 428	R 1,472	R 3,372	R 5,272	R 7,172	R 9,072	R 10,972
			Total production cost (R/ha):				**R 11,828**

TABLE 6.A ILLUSTRATES THE risk profile of maize production in the Northern Cape. Due to the relatively high input cost per hectare, farmers should harvest more than seven tons per hectare to be profitable in 2012. The most likely yield in the Northern Cape region ranges between 10 and 12 tons per hectare. At a farm gate price of R1500 per ton together with the expected yields, the risk position is generally positive.

Table 6.b: Sensitivity analysis for wheat production in the Northern Cape

	Yield (T / Ha)						
Farm gate price (R / Ton)	**5**	**6**	**6.5**	**6.8**	**7**	**8**	**9**
R 1,800	-R 1,648	R 152	R 1,052	R 1,592	R 1,952	R 3,752	R 5,552
R 1,900	-R 1,148	R 752	R 1,702	R 2,272	R 2,652	R 4,552	R 6,452
R 2,100	-R 148	R 1,952	R 3,002	R 3,632	R 4,052	R 6,152	R 8,252
R 2,200	R 352	R 2,552	R 3,652	R 4,312	R 4,752	R 6,952	R 9,152
R 2,300	R 852	R 3,152	R 4,302	R 4,992	R 5,452	R 7,752	R 10,052
R 2,400	R 1,352	R 3,752	R 4,952	R 5,672	R 6,152	R 8,552	R 10,952
R 2,500	R 1,852	R 4,352	R 5,602	R 6,352	R 6,852	R 9,352	R 11,852
R 2,600	R 2,352	R 4,952	R 6,252	R 7,032	R 7,552	R 10,152	R 12,752
R 2,700	R 2,852	R 5,552	R 6,902	R 7,712	R 8,252	R 10,952	R 13,652
			Total production cost (R/ha)				**R 10 648**

THE RISK PROFILE OF wheat production indicates a better picture than maize, as can be seen in Table 6.b. This is mainly due to higher yields due to irrigation. The most likely yield in the Northern Cape region ranges between 6 and 8 tons per hectare. At a price level of R2100 per ton, farm businesses will earn between R2 000 and R6 000 per hectare. At a yield and price combination of 5 tons per hectare and R1 800–R2 100 per ton, farmers will not make a positive gross margin per hectare.

THE IMPACT OF INCREASING INPUT EXPENDITURE ON DIFFERENT COMMODITY PRICE LEVELS – A STOCHASTIC APPROACH

Commodity price scenario – The stochastic output

The following section includes a stochastic approach, where the baseline result is compared to different price scenarios. The following assumptions in the scenario exercise were made:

- The same baseline results illustrated in the Baseline / current state of farm business section are compared to a maize price of 1) R1500 per ton and 2) R1350 per ton for 2014.
- The assumption thereafter is that these respective price levels will follow the same baseline projections as stipulated in Table 5.
- The current projection is that commodity prices will remain high due to drought conditions in the United States (US). High commodity prices could lead to a substantial increase in the summer grain area planted in 2012 which will increase production significantly if normal rainfall prevails. Together with an anticipated high intention to plant in the US in 2013, commodity prices such as maize could decline in 2014.
- The objective is to illustrate the most likely impact of increasing input expenditures on farm businesses given lower commodity price levels. The question can therefore be asked whether certain irrigation farmers can still be profitable given lower commodity prices and rapid increases in input costs. The output should not be seen as a forecast but rather a 'what if' scenario.

Figures 58.a, b and c illustrate the probabilities or stoplight charts of earning a return on investment (ROI) of 4.11 and 8.22 % respectively. The idea behind the stoplight charts is to indicate whether a farming business could win or lose against annual inflation. The ROI is based on the real net worth of the farm (total assets minus total liabilities in real terms).

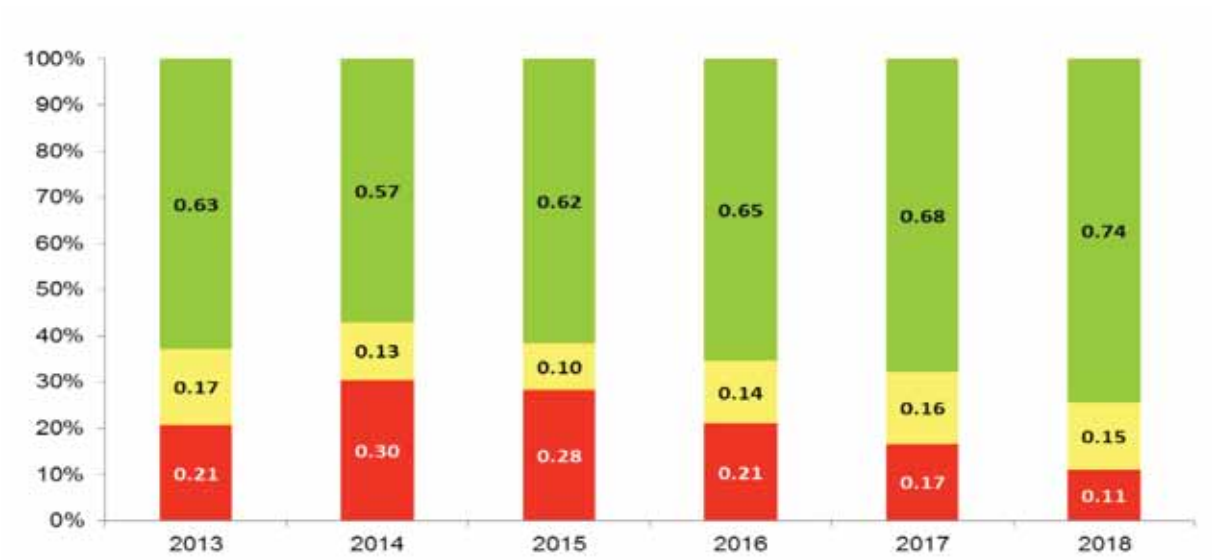


Figure 58.a: Stoplight chart for the probability of generating a return on investment between 4.11 % and 8.22 % (Baseline)

- Figure 58.a illustrates the baseline probability that a ROI between 4.11 and 8.22 % could realise from 2013 towards 2018.
- There is on average a 21 % chance that the ROI of the farming business will be less than 4.11 %.
- The figure further illustrates that there is a 14 % chance that the ROI will be between 4.11 and 8.22 % over the baseline period (baseline average).
- Finally, there exists a 65 % chance that the ROI will be more than 8.22 % on average.

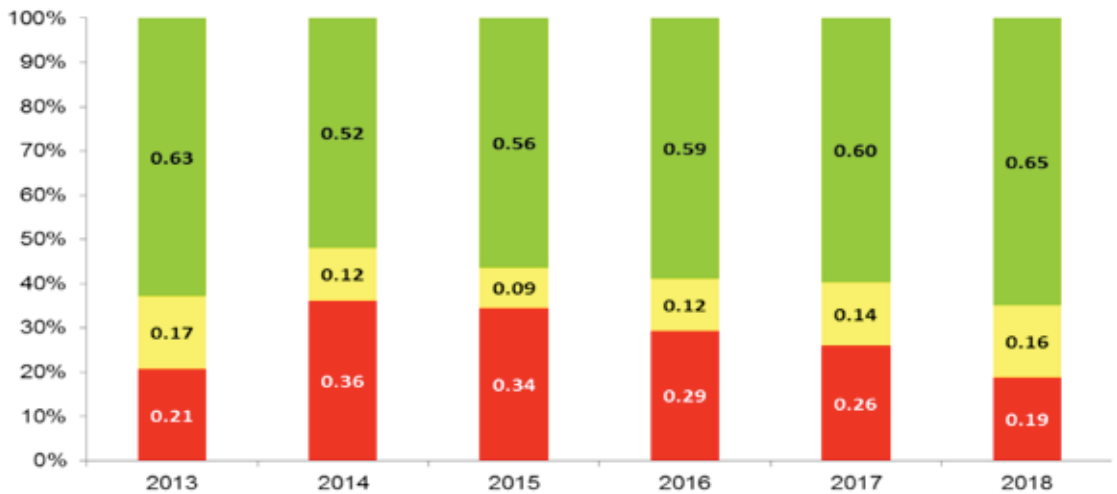


Figure 58.b: Stoplight chart for the probability of generating a return on investment between 4.11 % and 8.22 % (Maize price at R1500 per ton)

- Figure 58.b indicates a scenario where the maize farm gate price decreases to R1 500 per ton in 2014. Thereafter, the maize price will follow the baseline projections as stated in Table 5.
- The impact of the lower maize price can be seen when compared to the baseline stoplight chart.
- The probability that the ROI will be less than 4.67% increases by 7%. The latter indicates that there is a 28 % chance that the ROI will not be more than 4.11%.

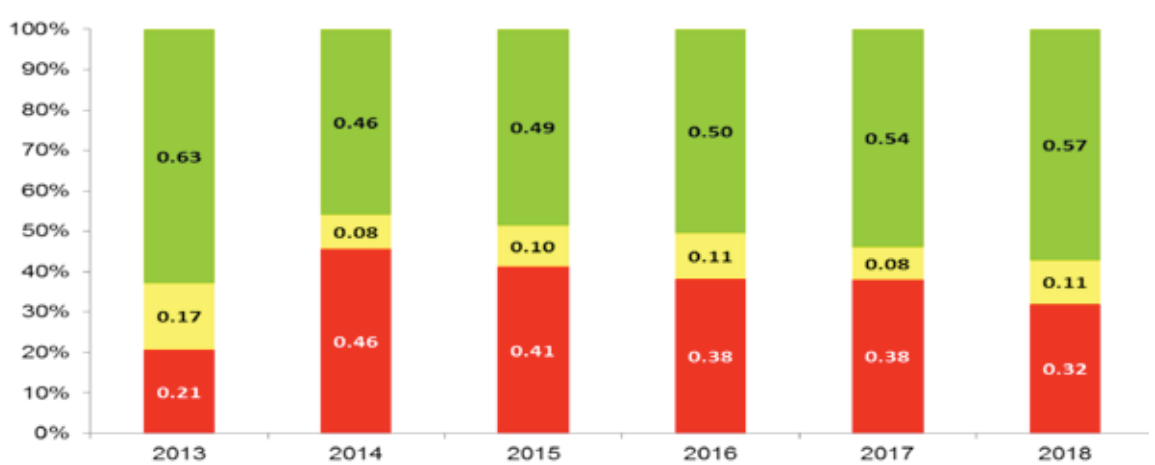


Figure 58.c: Stoplight chart for the probability of generating a return on investment of 4.11 % between 8.22 % (Maize price at R1350 per ton)

- The last stoplight chart illustrates the profitability decline when the maize farm gate price decreases to R1350 per ton.
- On average, there is a 36 % chance that the ROI will not be more than 4.11 %.
- There is an 11 % chance that the ROI will be between 4.11 and 8.22 %.
- Finally, the chance that the ROI will exceed 8.22 % is only 53 %.

CONCLUSIONS:

- The overall projection for the Northern Cape irrigation area reflects well. It must be noted that the US drought conditions in the first two quarters of 2012 changed the entire profitability picture. If normal rainfall prevailed in the US, commodity prices would have changed in an entire different direction. Given increasing input expenditure together with lower anticipated commodity prices, profitability levels would have remained under enormous pressure.
- The Northern Cape input cost component per hectare is normally higher than other irrigation farm businesses and regions.
- Increasing cost trends in selective inputs will cause pressure on the financial position of farm businesses in the Northern Cape.
- Key input costs such as fuel, fertiliser, irrigation electricity and seed should be carefully managed in the medium to long run due to expected annual inflation in the cost of these input variables.
- The stoplight charts and probabilities generally indicate a positive return on investment. A potential dip in 2014 can be expected due to a combination of macroeconomic drivers. Increased area together with normal weather patterns could cause commodity prices to tumble.

NORTHERN FREE STATE DRYLAND SCENARIO – A STOCHASTIC APPROACH

THE PREVIOUS SECTION INCLUDES the scenario analysis for an irrigation farm. The question may therefore arise whether dryland farms could experience the same risk profile and input challenges as irrigation farmers when the input expenditure projections are the same for dryland farmers, who have a lower input expenditure per hectare.

The selective farm is representative for the Bothaville/Wesselsbron region in the Northern Free State. The farm consist of mainly water table soils which creates a higher yield potential than in other regions in the Northern Free State. White maize and sunflower are produced on roughly 1100 hectares per annum. The average annual cost for maize and sunflower production is slightly higher than in other areas in the Northern and Western Free State. The average direct production cost for the 2010/2011 production season was R5200 per hectare for maize and R3400 per hectare for sunflower production.

THE STOCHASTIC OUTPUT

THE FOLLOWING KEY VARIABLES were made stochastic (random) in the representative farm modelling approach for maize and sunflower production for 2013 and onwards:

- Yield (based on past and projected yields)
- White maize and sunflower seed price
- Fertiliser direct input cost
- Fuel direct input cost

Figure 59 illustrates the NFI stochastic output and projections for the representative farm in the Northern Free State for the period 2011 – 2018. The three lines in the graph indicate the mean, minimum and maximum NFI for the baseline period. The output illustrates that, in 2013, the mean NFI as a result of the stochastic modelling exercise is R3.7 million. The important conclusion that can be made from the graph is the sideways movement of the mean value, which indicates that the NFI of the farm business could still remain competitive even with increasing input expenditure. The main reason why Figure 59 still reflects well is due to economies of scale and secondly, a lower input cost approach. This means that dryland farmers can still be profitable due to competitive gross margins per hectare. Figure 60 illustrates the gross margin calculations for maize and sunflower.

The production of sunflower can be characterised with lower production costs when compared to maize production. Figure 60 clearly indicates that maize production may be more profitable in the future due to a higher farm gate price (given the assumption that normal weather will prevail). It is also interesting to note that when a lower than average rainfall occurred as in 2012, sunflower profitability can decrease by almost 50 % due to sensitivity to weather conditions.

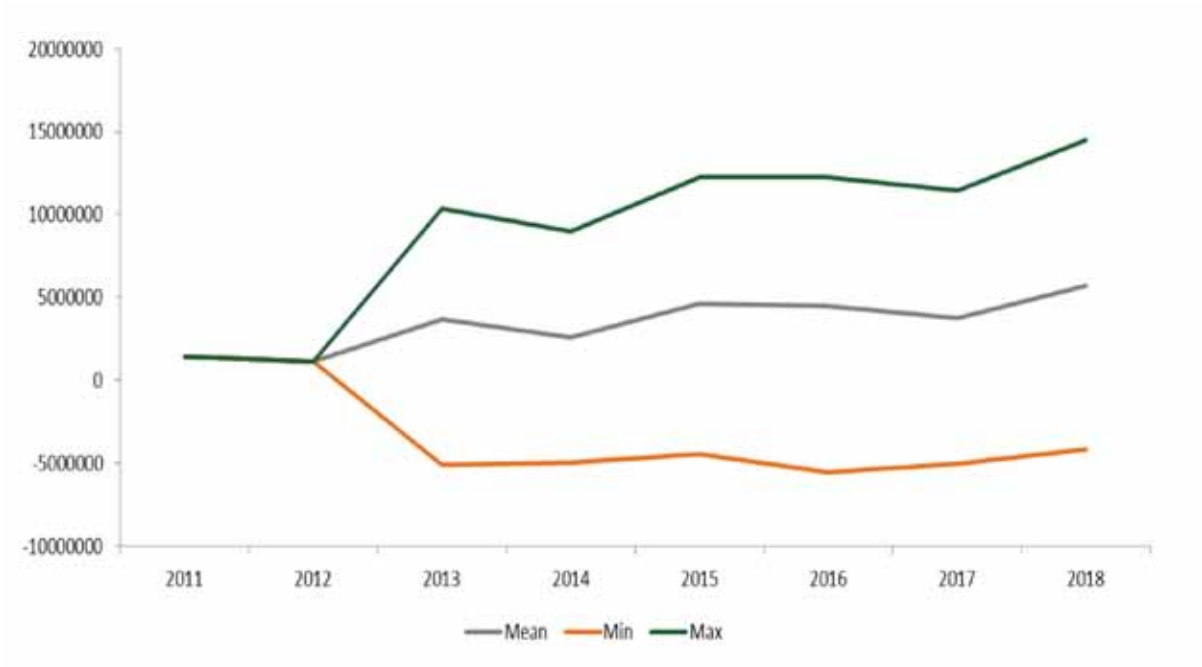


Figure 59: Net Farm Income (NFI) stochastic output for the Northern Free State farm (2011-2018)

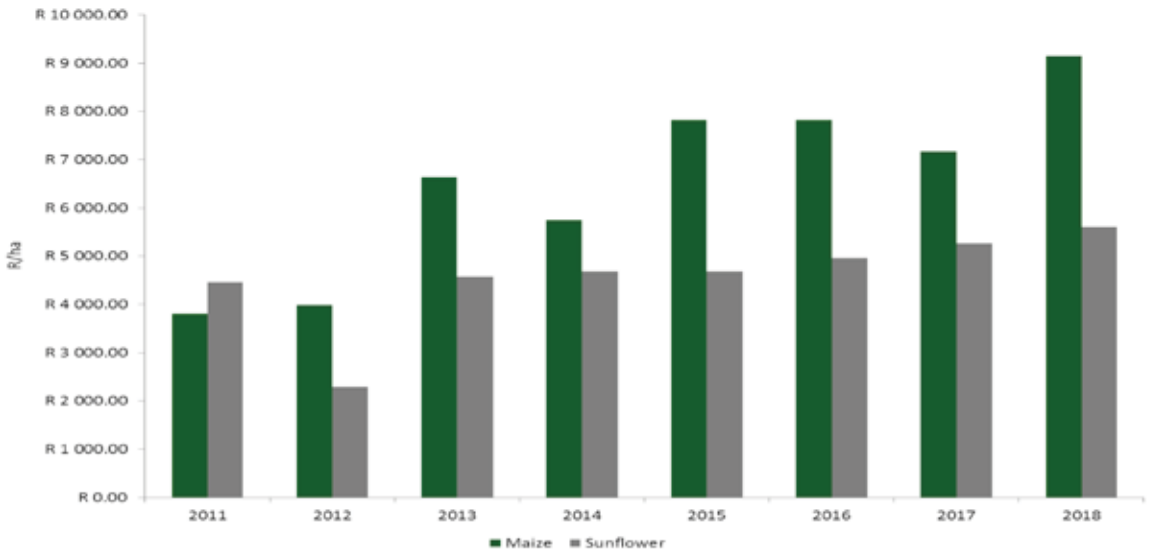


Figure 60: Gross margin projections for maize and sunflower (2011-2013)

AREA SCENARIO – THE IMPACT OF ECONOMIES OF SCALE

THE FOLLOWING SECTION PROVIDES an example of how economies of scale can impact the profitability of a farm business. A baseline together with two scenarios has been identified in order to illustrate the impact on smaller cultivated areas. The following scenarios have been identified and area adjustments in the model have been incorporated:

1. **Scenario baseline - Maize: 1030 hectares and sunflower: 120 hectares**
2. **Scenario 1 - Maize: 830 hectares and sunflower: 90 hectares**
3. **Scenario 2 - Maize: 630 hectares and sunflower: 60 hectares**

Scenario 1 and 2 will be compared to the mean value of the particular baseline. For the purpose of this exercise, the assumption is made that in 2013 the farm business only reduces the amount of hectares and that the farmer's overhead component remains the same.

- The average annual NFI projections for the baseline and two scenarios from 2012 to 2018 (Figure 61) are:
  - o Scenario baseline – R1.90 million (1030 hectares of maize and 90 hectares of sunflower)
  - o Scenario 1 – R0.90 million (830 hectares of maize and 90 hectares of sunflower)
  - o Scenario 2 – -R0.12 million (630 hectares of maize and 60 hectares of sunflower)
- When comparing the scenario baseline projections and annual NFI with scenario 1, the following conclusions can be made:
  - o The total area reduction in the scenario was approximately 17.85 %.
  - o The reduction in NFI from the baseline to the scenario was 52.63 %
- When comparing the scenario baseline projections and annual NFI with scenario 2, the following conclusions can be made:
  - o The total area reduction in the scenario was approximately 38.39 %
  - o The reduction in NFI from the baseline to the scenario was 106 %

The general conclusion that can be made is that economies of scale play a vital role when increasing input expenditures occur, considering that some portion of the farm's overhead cost will decrease as area reduces, but at a lower rate than variable costs.

Farm businesses will experience increased cost pressure over the intermediate and long term. Conventional farming methods should be re-evaluated in order to determine whether certain costs can be reduced. The cost of fuel not only impacts the farm diesel price but also increases other related input and output costs. For example, the cost of transportation is directly linked to deliveries of agricultural inputs to the farm. Therefore, farm businesses should think beyond the farm gate and the focus should extend across the entire value chain. Farmers should be informed about market conditions and the cost of agricultural inputs. Pro-active response is essential in order to remain sustainable in the next eight years.

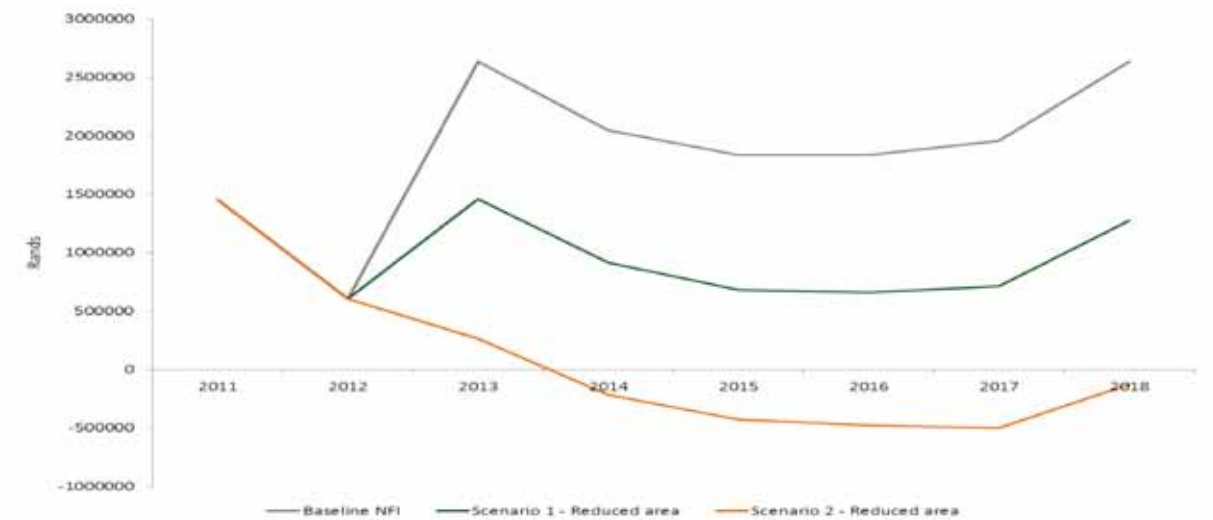


Figure 61: The impact of reduced area on NFI (2011-2018)

APPLES AND PEARS ANALYSIS – WESTERN CAPE

SUSTAINABLE DECIDUOUS FRUIT PRODUCTION SYSTEMS

TO ENSURE SUSTAINABLE FARMING the farmer should do the right things (be effective) and do things right (be efficient). Creative thinking and a pro-active attitude contribute to sustainability. The decision making environment in which the apple and pear farmer operates is uncertain, especially due to amongst others the long term nature of deciduous fruit production and the exposure to international markets. Decision making within such an environment requires effective strategic, operational and tactical management based on relevant management information. The BFAP baseline analyses and projections, as well as scenario evaluation can assist by quantifying strategic planning alternatives and evaluating the risks of alternative options.

Within the uncertain decision making environment the farmer has specific controllable variables to manipulate in the process of exploiting opportunities and keeping the farm business resilient. Decisions such as cultivar selection and mix, yield and quality, replacement strategy of orchards, as well as choice of market segment (export, local and processing) are but a few important parameters that will influence the net return to the farmer and the sustainability of deciduous fruit production. The BFAP farm level FinSim models were developed as decision making tools to assist in this kind of farm level managerial decisions. The effect of uncertain future product prices for apples and pears as main uncontrollable variables can be projected for any kind of deciduous fruit farm production system.

ANALYSES AND PROJECTIONS FOR A TYPICAL APPLE AND PEAR FARM

THE FINSIM FARM LEVEL model is capable of analysing a given farm business and then projecting future performance. The model is based on specific assumptions regarding various controllable parameters such as farm size (for evaluating amongst others the effect of economies of size), enterprise composition, up to 36 orchard blocks for apples and for pears with variable replacement cycles, age of first bearing and full bearing, as well as variable annual yields, input prices and product prices. Various categories/classes of output for apples and pears are provided for in the model to accommodate the different prices in the various market segments.

The farm level model is linked to the apple and pear sector model and BFAP macro model via indexes to respectively accommodate simulated projected cultivar prices and changes in the expected inflation rate for input prices, interest rates and other macroeconomic variables.

A typical apple and pear farm in the Western Cape was simulated and the performance of this farm was analysed based on 2010/11 production and market information. Then projections for the same typical farm were simulated for the period 2012 to 2016. The description and characteristics of this typical farm was based on Hortgro Services (2012) data and adjusted by a panel of farmers at a group discussion. It is important to note that this is a typical farm for a specific set of assumptions and is not necessarily representative of the apple and pear industry of South Africa.

The area and composition of apple and pear cultivars, as well as the respective full bearing yield of each cultivar for the typical farm are presented in Table 7. The area of each specific cultivar was further modelled into three blocks of different ages to ensure a spread of blocks of different ages over the specified lifespan of the orchards. The yield per cultivar is specified in various grading classes, with corresponding 2011 prices per class as indicated in Table 8. These prices are farm gate prices and allow for a situation where the packaging of the fruit is done off farm. In Table 9, some assumptions are explicitly stated regarding the production practices and assumed production cost for this typical farm. The specified directly allocatable cost exclude packaging cost.

Table 7: Area and yield of apples and pears for a typical farm in the Western Cape (2010/11 production year)

Cultivar	Area		Yield (full bearing)
	%	ha	(ton/ha)
Granny Smith	25	10.8	50
Golden Delicious	30	13.2	60
Royal Gala	15	6.8	50
Pink Lady / Cripps Pink	9	4.1	60
Topred / Starking	10	4.2	45
Fuji	7	3.1	55
Braeburn	4	1.8	55
Total	**100**	**44**	
Packham's Triumph	55	6.0	60
Forelle/ Vermont Beauty	18	2.0	40
Bon Chretien	18	2.0	50
Abate Fetel	9	1.0	40
Total	**100**	**11**	
Total cultivated area		**55**	

Table 8: Grading and farm gate prices of apples and pears for a typical farm in the Western Cape (2010/11 production year)

Cultivar	Grading (% of yield)					Price in R/ton (farm gate price)			
	Class 1		Class 2	Class 3		Class 1	Class 2	Class 3	
Apples	Export	Local	Local	Processing	Canning	Average	Local	Processing	Canning
Granny Smith	40	10	10	40		1973	1216	700	
Golden Delicious	40	10	15	35		2554	1486	700	
Royal Gala	50	5	20	25		2703	1351	700	
Pink Lady / Cripps Pink	45	10	20	25		2973	1351	700	
Topred / Starking	32,5	32,5	17	18		2703	1486	700	
Fuji	45	10	20	25		4054	811	700	
Braeburn	45	10	5	40		2162	676	700	
Pears									
Packham's Triumph	58	14	10	18		2262	780	650	
Forelle/ Vermont Beauty	67	5	10	18		3810	650	650	
Bon Chretien	50	5	10	10	25	1786	780	650	1200
Abate Fetel	70	7	5	18		3452	650	650	

Table 9: Assumptions regarding apple and pear production practices and cost for a typical farm in the Western Cape

Characteristic	Apples	Pears
Age of first bearing (year)	3	5
Age of full bearing (year)	7	10
Replacement age (years)	25	30
Establishment cost (R/ha)	180 000	174 600
Directly allocatable variable cost (excluding packaging) (R/ha)	39 565*	32 799*
Fixed and other variable cost for the farm (including permanent labour) (R) 2 481 597**		

*full bearing

**excluding interest and entrepreneurial reward

VARIOUS PERFORMANCE MEASURES WERE generated for this typical farm. Some of these results will be illustrated and discussed below. To also illustrate the effect of higher yields for apples and pears on the performance of such a typical farm, the same typical farm was evaluated with a 10 % and 15 % higher full bearing yield for pear and apple cultivars respectively (refer to the full bearing yields in Table 7). The simulated results for this typical farm for the two assumed scenarios for full-bearing yields for apples and pears are illustrated and discussed below. The 'low' scenario is based on the yield assumptions in Table 7 and the 'high' scenario on the same assumptions except that the full-bearing yields were assumed at higher levels.

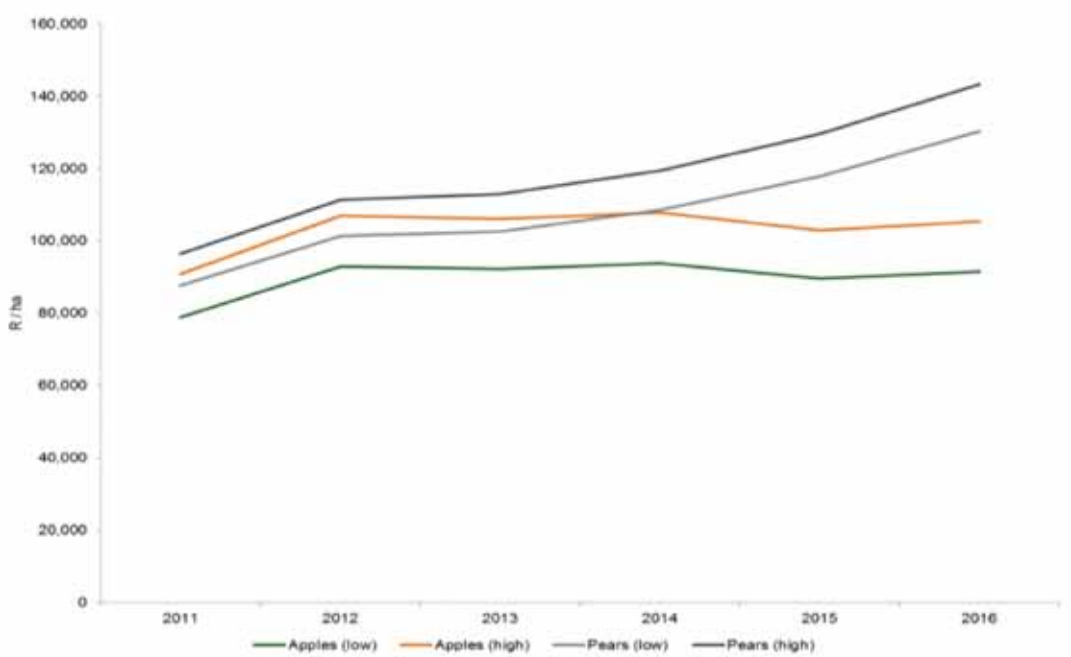


Figure 62: Simulated mean Gross Production Value for a typical apple and pear farm with low and high yields respectively

FROM FIGURE 62 IT is clear that the mean gross production value (GPV) for pears displays an upward trend for the near future, while the GPV for apples will stabilise and even start to decline slightly. The differences in the absolute values and the trend of the simulated GPV are attributed to differences in cultivar composition, the assumed yields of the various cultivars apples and pears and the market and price structure of the various cultivars for the typical farm.

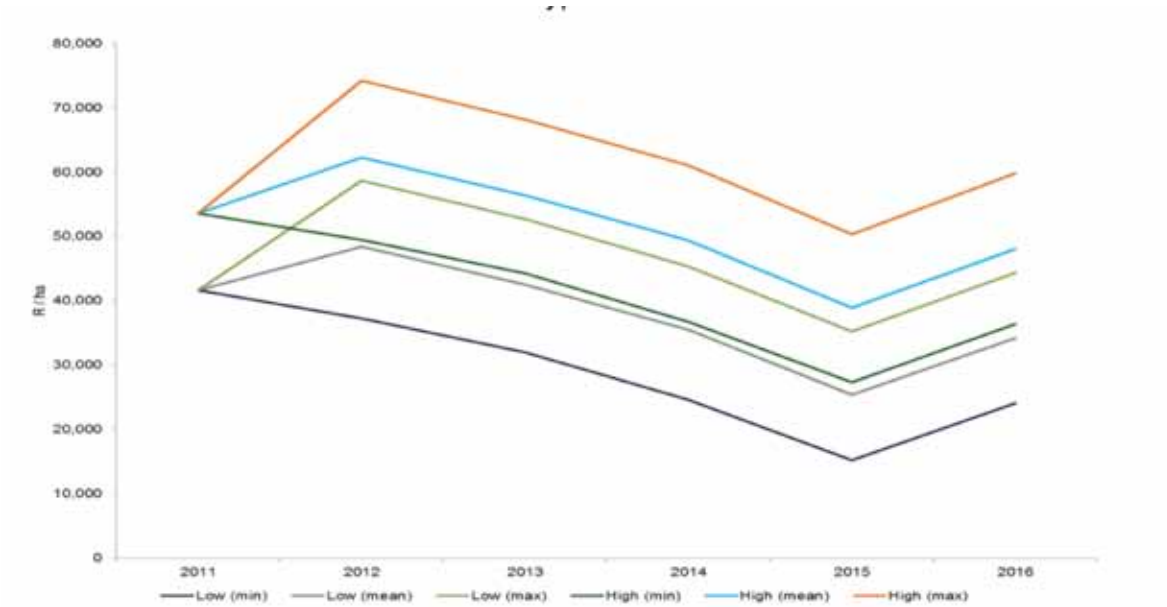


Figure 63: Simulated minimum, mean and maximum Gross Margin for apples with low and high yields respectively

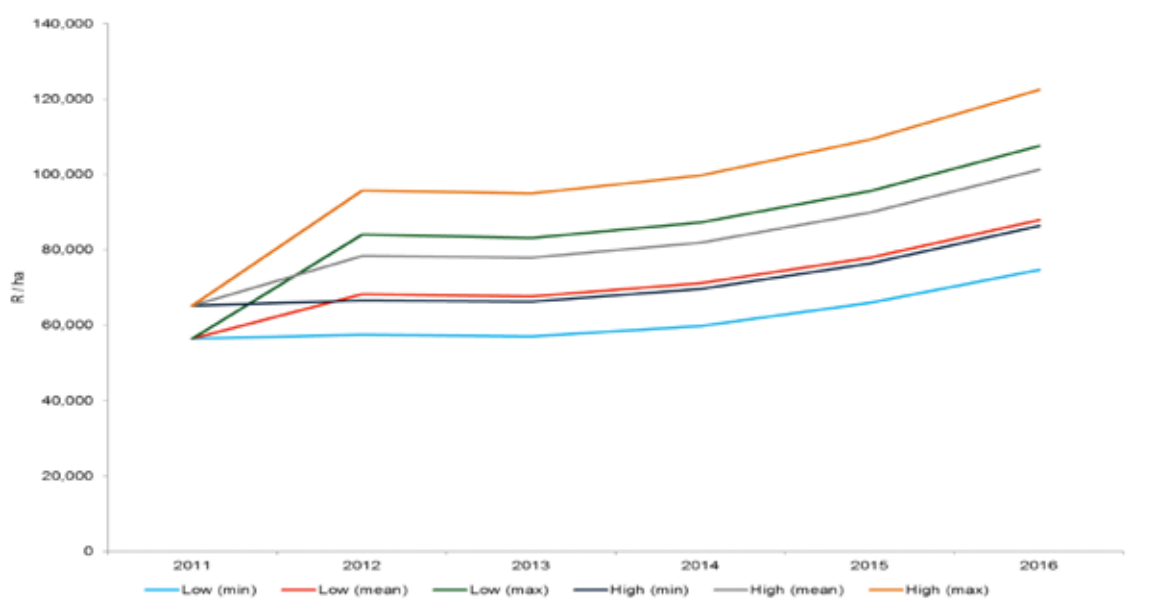


Figure 64: Simulated minimum, mean and maximum Gross Margin for pears with low and high yields respectively

ACCORDING TO FIGURES 63 and 64, the mean gross margin (GM) per ha for pears appears to be higher than for apples. This is due to a relatively higher mean GPV for pears than for apples and the higher directly allocatable variable cost per ha for apples than for pears. The GM per ha for apples and pears follows the same trend as the GPV of each product in Figure 62. Furthermore, the high establishment cost for new blocks of specific orchards that are replaced, could be a further contributing factor to variability in the projected mean gross margins. An overlap between the variability band of the GM for 'low' and 'high' yield scenarios does exist for both apples and pears.

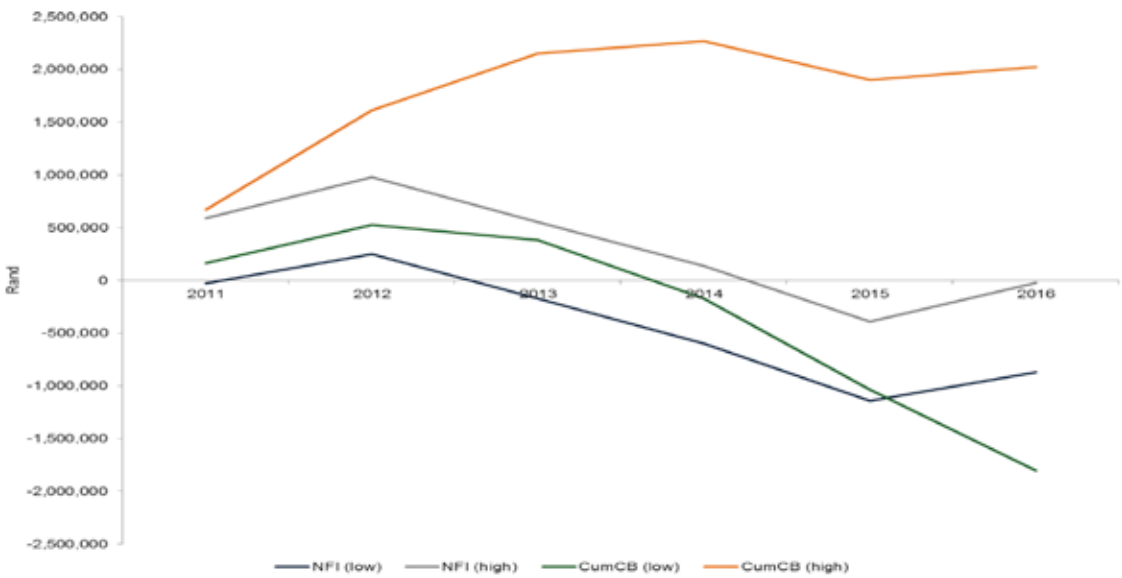


Figure 65: Simulated mean Net Farm Income (NFI) and Cumulative Cash Balance (CumCB) for a typical apple and pear farm with low and high yields respectively

FIGURE 65 REPRESENTS THE mean annual net farm income (NFI) and the cumulative cash balances for the typical farm for both yield scenarios. An entrepreneurial reward of R500000 in 2011 (and escalating annually) is included as a cash outflow in calculating the cumulative cash balances. The downward trend in the NFI can be attributed to the relatively large area of apples (44 ha versus 11 ha pears) and thus NFI is following the same general pattern as the mean GPV for apples. The typical price-cost squeeze can further contribute to this trend in NFI. The effect of higher yields per ha is clear from the cumulative cash balances. The 'low' yield scenario is not sustainable, given the assumptions for this typical farm and is clear from the sharp declining cumulative cash balance in Figure 65.

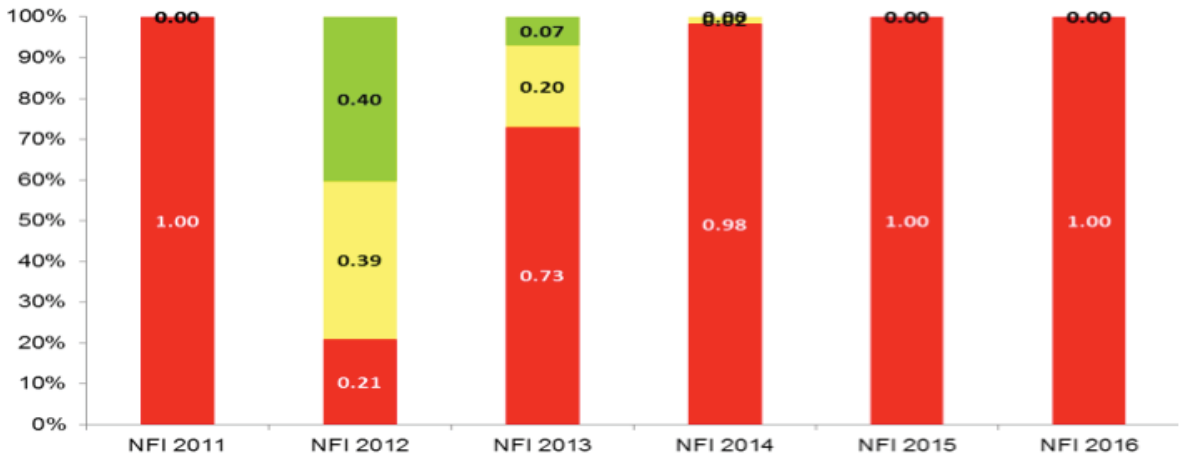


Figure 66: Probabilities of the mean Net Farm Income (NFI) for a typical apple and pear farm with low yields

- Green coloured area: Probability of NFI higher than R300 000
- Yellow coloured area: Probability of NFI between R0 and R300 000
- Red coloured area: Probability of a negative NFI

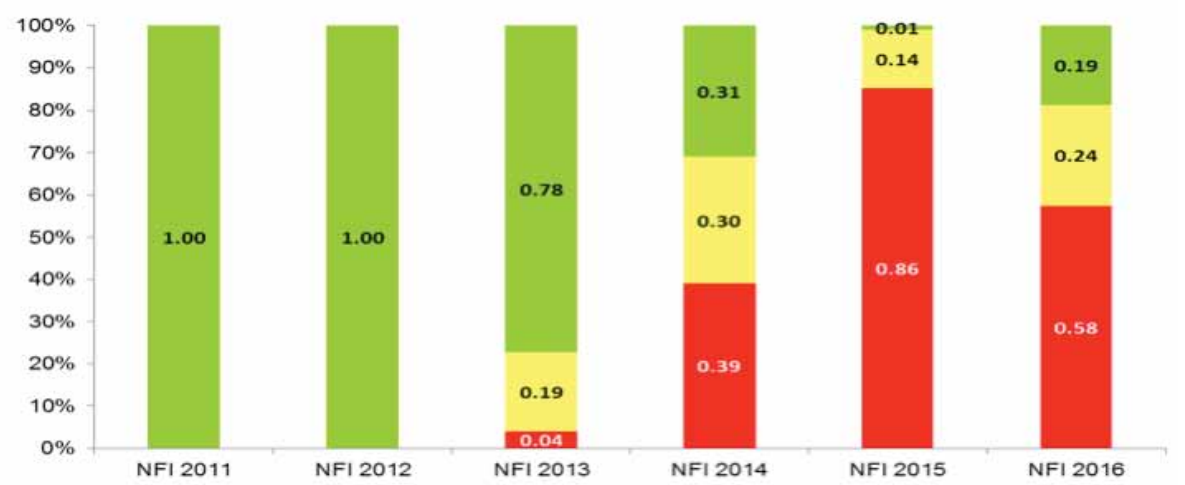


Figure 66: Probabilities of the mean Net Farm Income (NFI) for a typical apple and pear farm with high yields

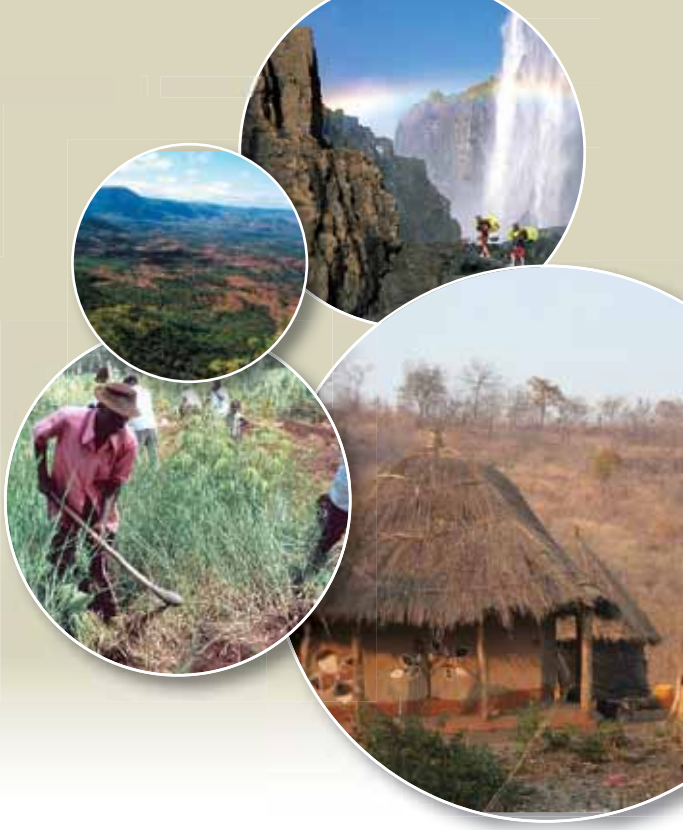
- Green coloured area: Probability of NFI higher than R300 000
- Yellow coloured area: Probability of NFI between R0 and R300 000
- Red coloured area: Probability of a negative NFI

THE PROBABILITIES OF THE mean NFI for a typical farm falling within specific ranges are clear from Figures 65 and 66. The probability of a negative NFI for the 'low' yield scenario is 100 % in three years and also relatively high for the projected NFI in 2013 and 2014. The situation for the 'high' yield scenario in Figure 66 appears more optimistic, although the probability of a negative projected NFI is present in the last three years of the projection period.

The results and projections displayed and discussed above should not be seen as forecasts, but rather in the context of 'what if …?' scenarios. The farmer should be creative and pro-active in evaluating the effect of alternative actions and implement those actions that utilise opportunities and follow practices that contribute to sustainable farming systems.

BFAP BASELINE AGRICULTURAL OUTLOOK

zambian outlook



INTRODUCTION

THE OUTLOOK OF GLOBAL agricultural markets is frequently presented by a broad host of institutions. The presentation and the content of these projections vary, mainly on the bases of commodity, country coverage and the outlook period. In general, the agricultural markets in developed countries as well as emerging economies such as Brazil, Argentina, India and China are well-informed, since the potential impact of these markets on global conditions can be significant. In comparison, the coverage of agricultural markets in sub-Saharan Africa is limited and aggregate models and/or approaches, which assume long-run price relationships between domestic and global commodity prices, are often utilised in an attempt to capture key underlying trends for the continent.

The severe impact on sub-Saharan Africa of the 2007/2008 global food and subsequent financial crises has made it imperative that a fuller, more comprehensive understanding of the complex relationship that exists between world food prices and those within Africa be developed in order to ensure regional food security. While changing conditions in world markets do have an undeniable effect on prices within the African region, studies have shown that other factors such as market structures, the policy environment, weather-related supply shocks, regional trade flows, etc. also have a significant impact on the price discovery process and need to be accounted for when attempting project future prices within these markets.

It is the intention of BFAP to develop a disaggregated, African-specific modelling framework that links the South African agricultural sector to those within the southern African region. The purpose of such a model will be to produce an African Outlook which informs regional trade policy, private and public sector investment, as well as food-security initiatives within the agricultural subsectors of the region.

However, the development of such a model is not without its own, unique set of challenges which can only be overcome through collaborative initiatives and research. To that end, BFAP in collaboration with the Indaba Agricultural Policy and Research Institute of Zambia have developed a partial-equilibrium model of Zambia's grain markets which accounts for the relevant market and policy issues. This model lays the groundwork for the establishment of a regional policy network which would support the development and maintenance of a regional, partial-equilibrium model.

MAIZE SITUATION OUTLOOK

VALUE-CHAIN MAPPING

MAIZE IS THE MOST important staple crop in Zambia, supplying approximately 60 % of all calories consumed in the country (Haggblade and Nielson, 2007; Chemonics International Inc, 2010). Smallholders account for 79 % of maize production in the country, while in recent years commercial maize production has fallen by almost 30 % as commercial farmers have shifted from maize to exportable crops with higher added values such as cotton, soya and sunflower (JAICAF, 2008).
Zambian maize is mostly used as food, although it is also used for brewing and animal consumption. An estimated 50 % of the maize produced in Zambia is supplied to subsistence consumption and does not enter the market (Chemonics International Inc, 2010).

Following the liberalisation of maize prices and distribution, the government created the Food Reserve Agency (FRA) in 1995. The FRA was given the mandate to stockpile commodity reserves such as maize as a food security measure. However, in practice, FRA influences the prices and distribution of maize by buying and selling a certain percentage of gross domestic maize production at fixed prices. The purchasing activity is focused on small farmers in disadvantaged areas, where private merchants and companies do not operate due to transportation infrastructure constraints. The FRA purchases maize at 700 sites nationwide at a uniform price, which is higher than the market price. Under this scheme, the FRA bought 386,000 tons (27 % of gross production) and 396,000 tons (29 %) of maize in 2006 and 2007, respectively (JAICAF, 2008).

About 70 % of the maize that is purchased is from the smallholder farming sector with the remainder being derived from commercial farms. Smallholders arrange for the consolidation of their loads and small traders deliver them in one to five truck-loads to the large commercial traders. At the beginning of the season the maize is passed on to the millers and the remaining 80 % stored to fulfil mandates with the millers up to February. The brewing industry, on the other hand, requires approximately 50 000 MT of maize per annum (Chemonics International Inc, 2010).

Maize in villages is usually toll-milled for home consumption using diesel or electric powered hammer mills, of which there are possibly 5,000 on farms and in villages in private ownership around the country (Chemonics International Inc, 2010).

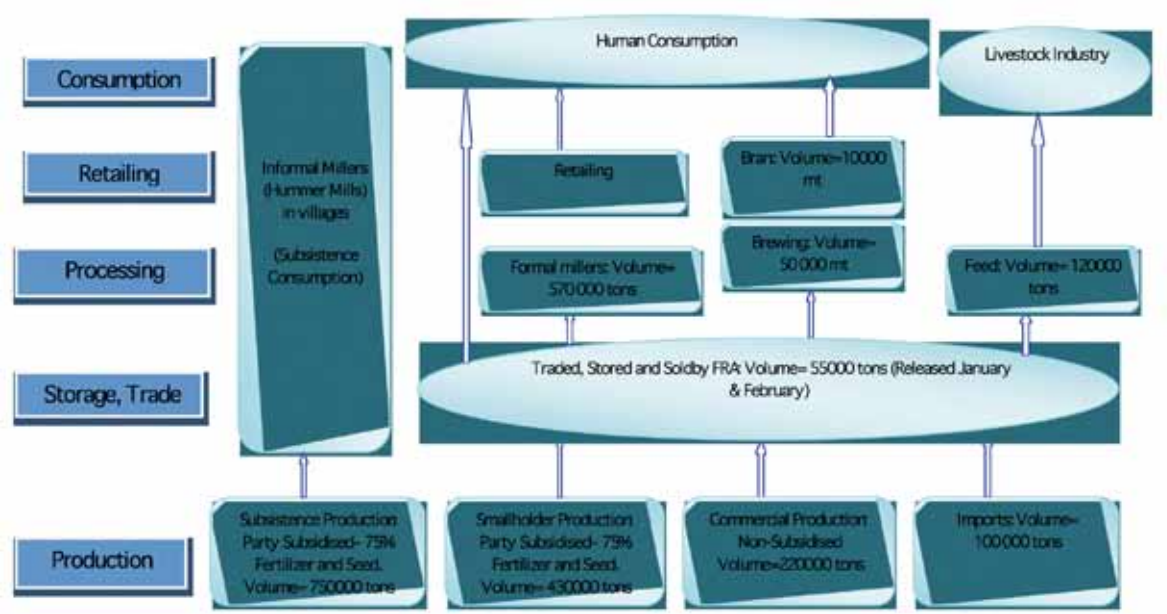


Figure 67: Zambian maize flow diagram: 2009
Source: USAID/CCOMESA, 2010

TRADE ANALYSIS

SOUTH AFRICA DOMINATES THE Zambian import market for maize, exporting an annual average of approximately 32.5 thousand MT between 2001 and 2011. This implies an annual average market share of approximately 70 % of total maize imports. Following the global food crisis of 2008, South Africa continued to strengthen its position in the Zambian import market for maize, with market shares ranging from 83 % to 100 %. However, despite this growth in market share, the total volume of maize imports fell significantly, with imports in 2010 and 2011 amounting to 802 and 733 MT respectively. The fall in maize imports coincides with the growing domestic maize production fuelled by the FRA maize price support programme.

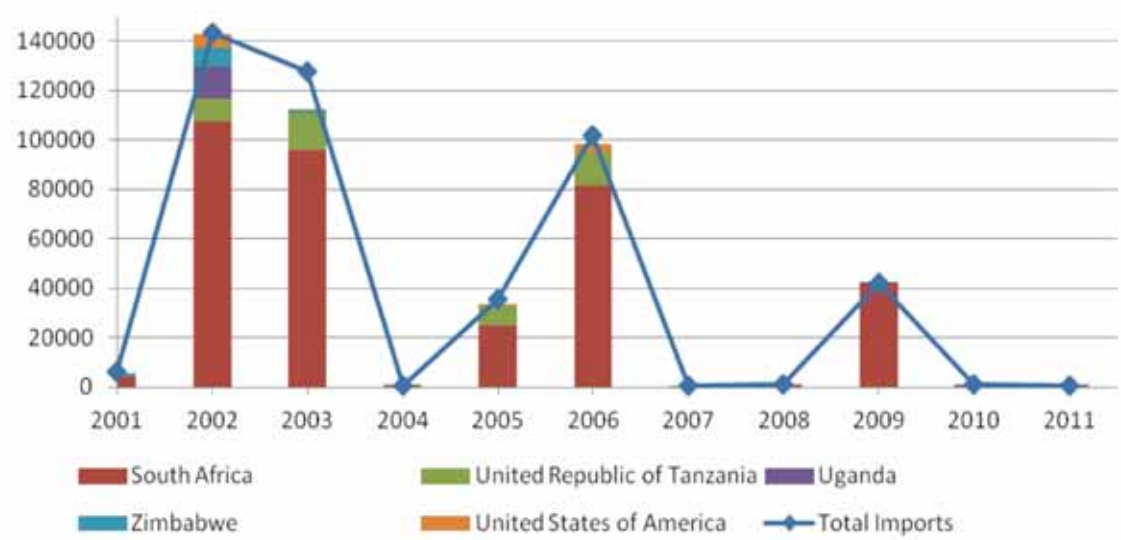


Figure 68: Primary supplying market for maize (SIC: 1005) imported by Zambia (MT)
Source: ITC calculations based on UN COMTRADE statistics

ZAMBIA TENDS TO BE a net importer of maize. In 2007, given rising global commodity prices, Zambia experienced an increase in domestic production, resulting in a move from a net importer to a net exporter of maize. Following the 2008/2009 global recession and the attending fall in commodity prices, Zambia, through domestic price support programmes, experienced record production levels, again resulting in maize exports increasing substantially while imports fell to less than 1 000 MT in both 2010 and 2011.

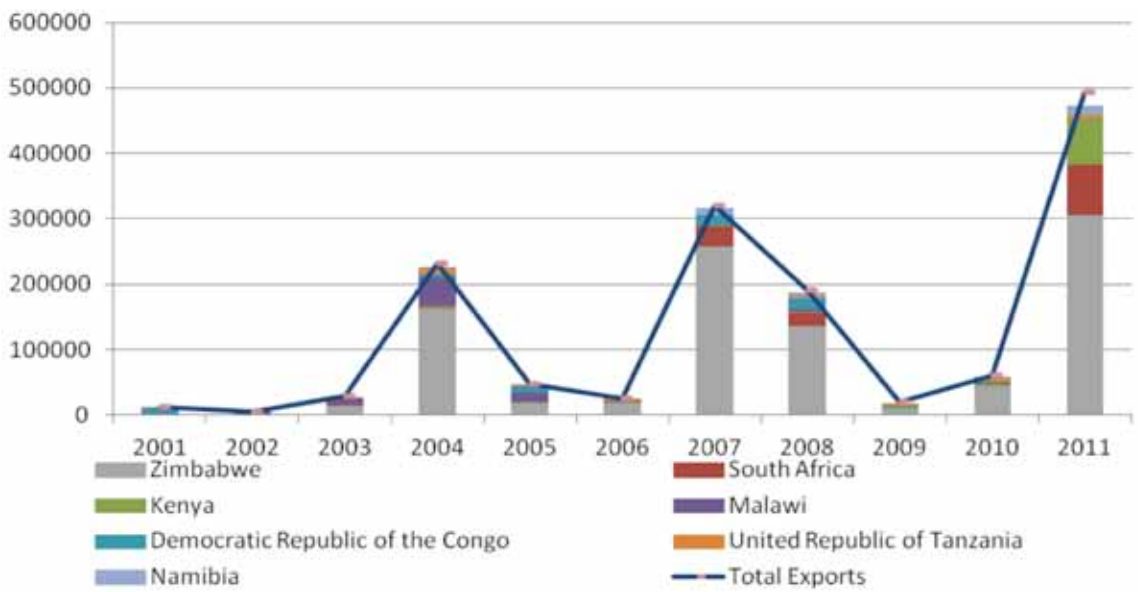


Figure 69: Primary importing market for maize (SIC: 1005) exported by Zambia (MT)
Source: ITC calculations based on UN COMTRADE statistics

THE IMPACT OF THIS change in trading patterns on South African maize output markets within the region has been significant. Prior to 2010 and 2011, Zimbabwe and Kenya were primary output markets for South African maize exports, importing an annual average of approximately 388 279 MT and 176 689 MT respectively between 2001 and 2009. However, as domestic production increased in response to the government price support programme, the Zambian share of the Zimbabwe and Kenyan maize export market grew, with total export volumes reaching 304 353 MT and 78 232 MT, respectively. For South Africa, these markets closed, with total exports falling to 11 340 MT to Zimbabwe and 1 270 MT to Kenya. Instead, South Africa was forced to diversify the maize output market and expand into new markets such as Mexico and Korea.

MAIZE COMMODITY MARKET OUTLOOK

OVER THE PAST FIVE years, the area under maize production in Zambia has expanded by more than 70 %. The Food Reserve Agency's (FRA) offering of maize prices that are significantly higher than market related prices has provided sufficient incentives for small scale growers to expand the area under maize production. Contrary to popular belief, the majority (approximately 70 %) of the expansion in maize plantings took place among small-holders and not large commercial operations, simply because the FRA does not purchase maize from large-scale commercial operations at subsidised prices.

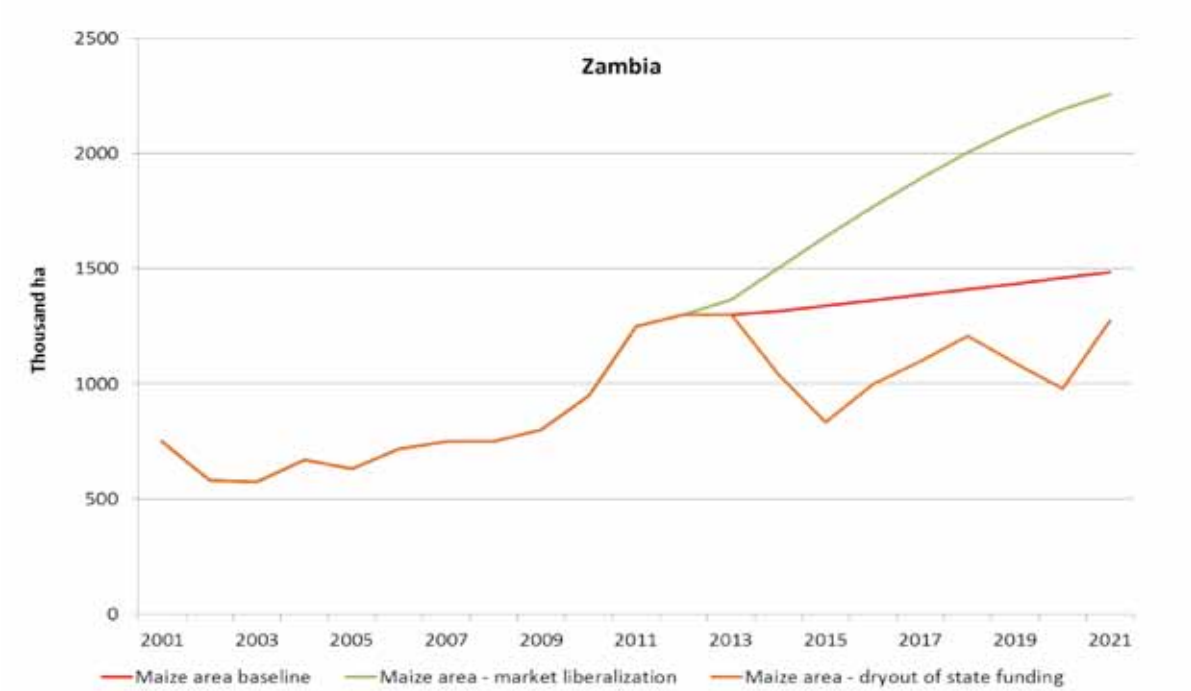


Figure 70: Zambian maize area planted

THE ZAMBIAN GOVERNMENT HAS not only intervened in the markets by means of offering higher maize prices, but also through subsidised fertiliser prices. This has boosted average national yields from approximately 1.6t/ha in the early 2000s to an estimated national average yield of 2.3t/ha in the 2011/12 production season. Due to the rapid rise in production, major surpluses of maize have piled up with stock levels increasing to well over 1 million tons in the past two seasons. Out of the total 2011 crop of 3 million tons, government bought 2.1 million tons through the FRA at a price of $280/ton. Although a large portion of this crop was sold to local millers at a discounted price of $140-$170/ton, stock losses due to lack of appropriate storage facilities have been severe. A lot of new storage facilities have been erected, which will improve the country's ability to store grain. Exports to neighbouring countries (mainly Zimbabwe and DRC) have picked up, yet the private industry argues that monthly exports cannot exceed 50 000 tons due to a lack of infrastructure and congestion at border posts. Private industry and large commercial operations are currently hesitant to invest in the maize industry, mainly due to the uncertainties with respect to government intervention in the market. From Figure 71 below, it is evident that the Zambian maize market has not been well integrated with the SAFEX and world maize markets. Especially in the past five years, prices have been extremely volatile and there has been a complete disconnect with world markets due to FRA pricing strategies as well as import and export parity bands.

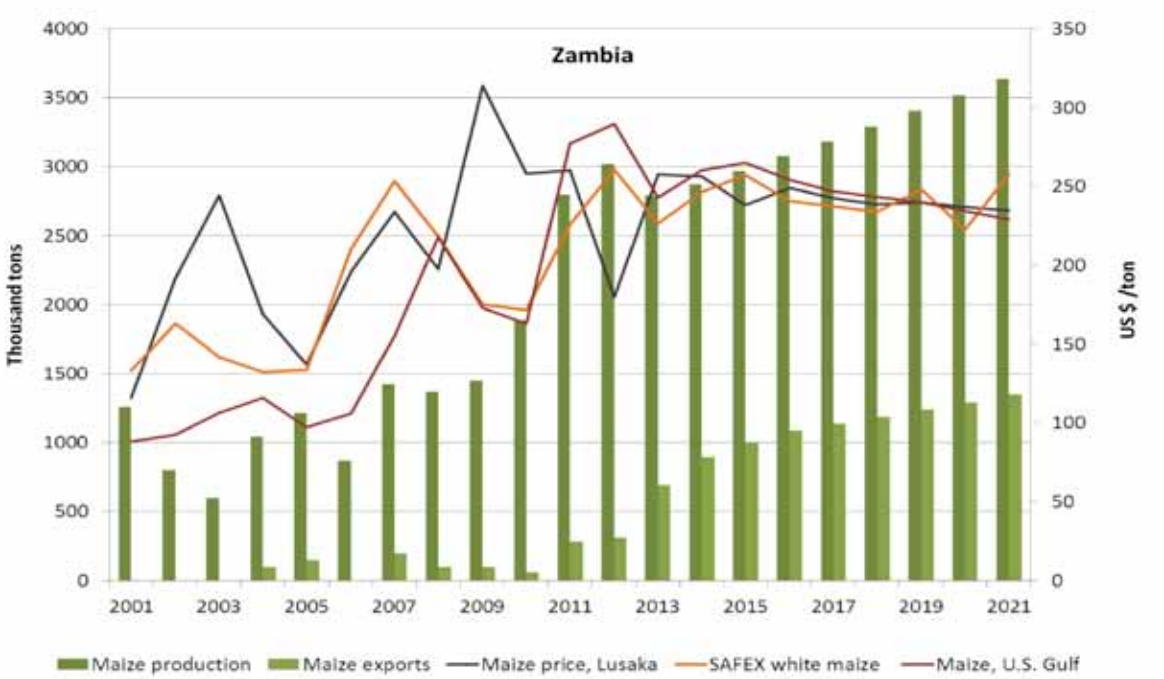


Figure 71: Zambian maize production, exports and prices

DUE TO SIGNIFICANT GOVERNMENT intervention in the maize market, there are a number of plausible future scenarios that can evolve. Figure 70 presents the baseline scenario as well as one future outcome where the area under maize production continues to expand rapidly to reach 2.3 million ha by 2021 under the assumption that the market is liberalised and private investment takes place. Another plausible outcome is also presented where the area under maize production declines and is very volatile as government funding is depleted due to the excessively expensive current subsidy programme. Under this scenario, it is likely that some form of government support will still be allocated every fifth year in order to coincide with an election year.

Under the baseline, it is assumed that some form of government support will remain, but with more clear direction and signals to the market at what level and timing these support measures might kick in. As a result, the area under maize is anticipated to increase modestly over the period of the outlook. Model simulations illustrate that under the baseline scenario, Zambia will become a major source of exports into the Southern African region with almost 1.5 million tons being exported per annum by 2021. This will only materialise under the assumption of no further export limitations and a general upgrade of border post facilities and infrastructure.

Zambia has vast tracts of land that can be unlocked for agricultural production. There are a number of proposals regarding land reform policies. In each of the ten provinces the government has identified farming blocks of between 100 000 ha to 150 000 ha. Government's vision for each of the farming blocks is to establish one nucleus commercial farming operation of approximately 10 000 ha and then let smaller units develop around the commercial farm. There has been very little private investment so far, but under a favourable political environment, investment in these farming blocks is likely to excel. This could bring another 1.5 million hectares under production over the long run.

WHEAT SITUATION OUTLOOK

VALUE-CHAIN MAPPING

THE MAIN ACTIVITIES ALONG the Zambian wheat value chain include farming, storage, milling, baking, wholesaling and retailing of wheat based products. The downstream activities include cultivation of the crop by farmers, all of whom are commercial entities. This is followed by storage on farm, or at assembly points and facilities run by private and public entities such as that of Agri options of Mkushi and the FRA. From storage, the wheat is sold and transported to the millers, who are concentrated on the Copperbelt and in Lusaka, for milling into flour. Local milling of the wheat into flour utilises almost all the domestic production. The bulk of the flour produced by the millers goes into the manufacture of baking and confectionery products such as pan loaves of bread, specialty bread, rolls and buns, cakes, crackers, biscuits and pasta.

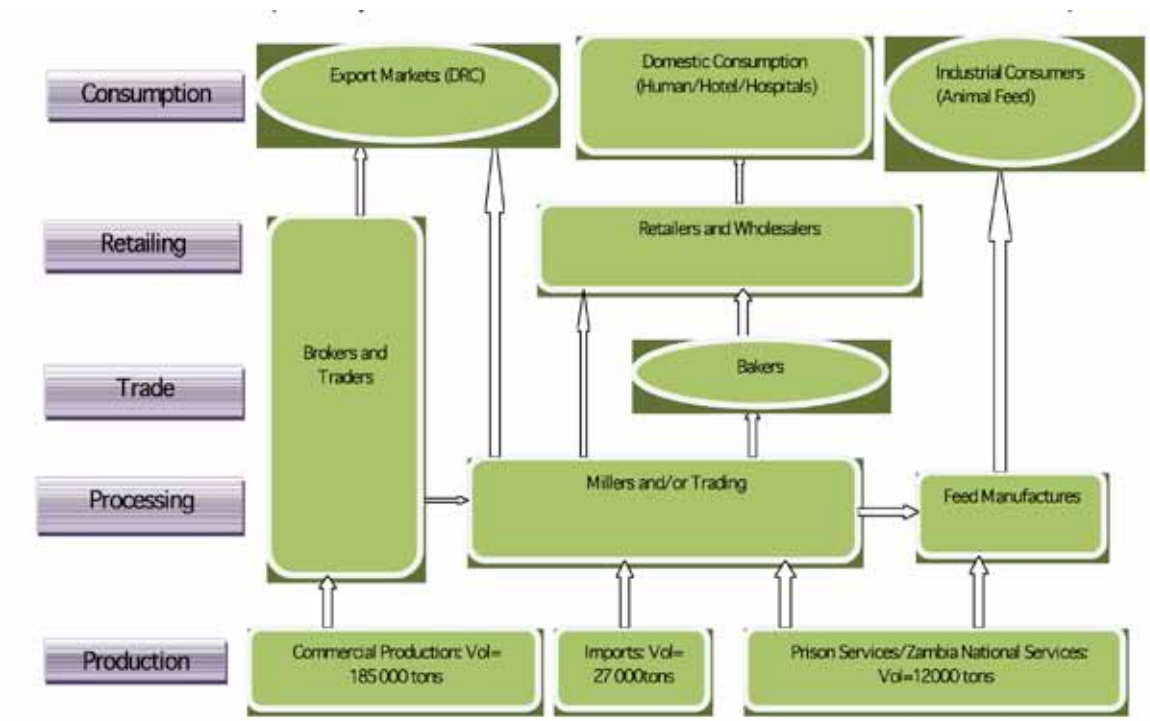


Figure 72: Zambian wheat flow diagram: 2009
Source: USAID/CCOMESA, 2010

TRADE ANALYSIS

IN MOST YEARS ZAMBIA is a net importer of wheat, with domestic exports being negligible. South Africa, in general, is an important source of wheat for Zambia, with total market share ranging from 40 % to 100 %. However, despite South Africa's strong position within the Zambian market, total import volumes have been declining since 2003. Between 2001 and 2011, wheat imports fell from 52 231 MT to 14 520 MT. This decline in imports is largely driven by expanding domestic production of wheat by large-scale commercial farming operations moving the country from being a net importer to a net exporter of wheat between 2010 and 2011.

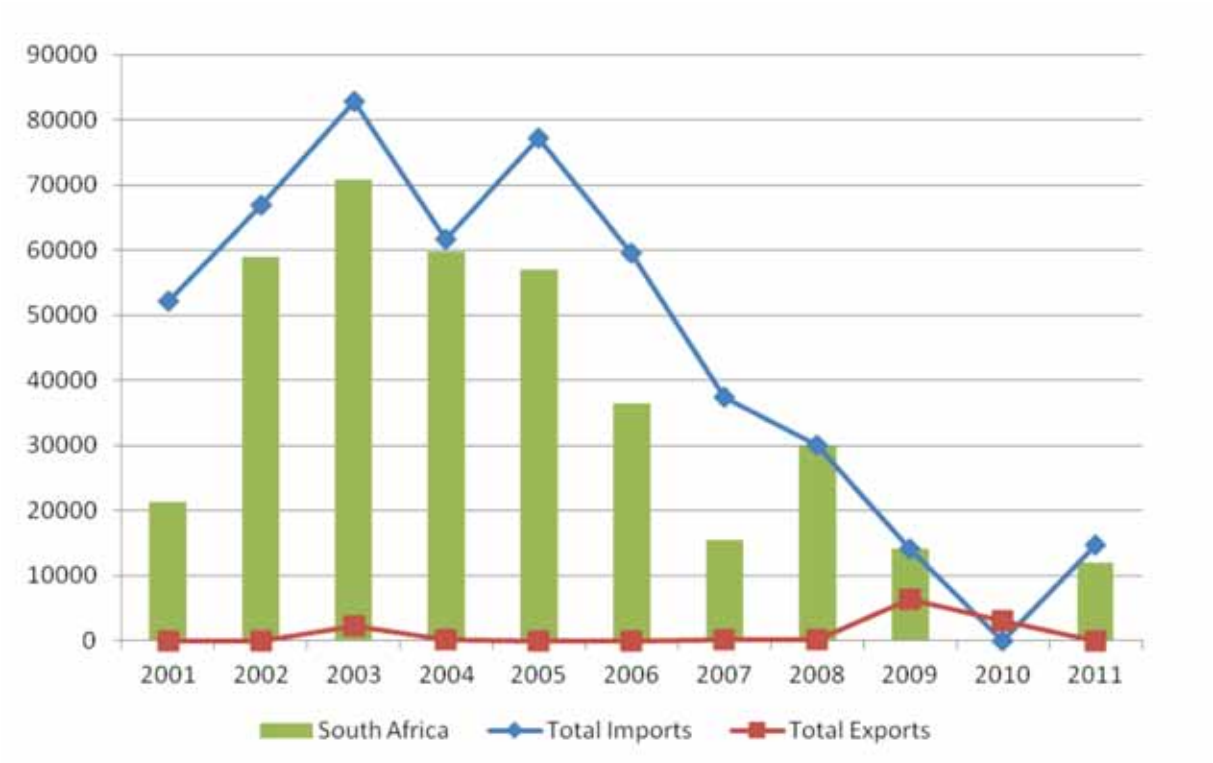


Figure 73: Trade flow and primary supplying market for wheat (SIC: 1001) imported by Zambia (MT)
Source: ITC calculations based on UN COMTRADE statistics

WHEAT OUTLOOK

SIMILAR TO MAIZE, THE area under wheat production has also increased rapidly over the past five years, yet this expansion in area can mainly be attributed to commercial farming operations and not small-scale growers. From Figure 74, it is evident that the Zambian wheat market has been relatively well integrated with world markets, trading mostly within the import-export parity price band and following general market trends. This has provided commercial farmers and traders with clear market signals for decision making. Market intervention by government through the FRA has been limited compared to the interventions in the maize market. The wheat industry is also far smaller than the maize industry and is not a crop that is produced by a large number of small scale growers. Due to a

relatively favourable market and political environment, there is significant potential for the wheat industry to grow in Zambia. The area under production is anticipated to expand comfortably beyond 80 000 ha over the next ten years. As a consequence, domestic wheat prices are expected to trade relatively closer to export parity levels compared to the past decade.

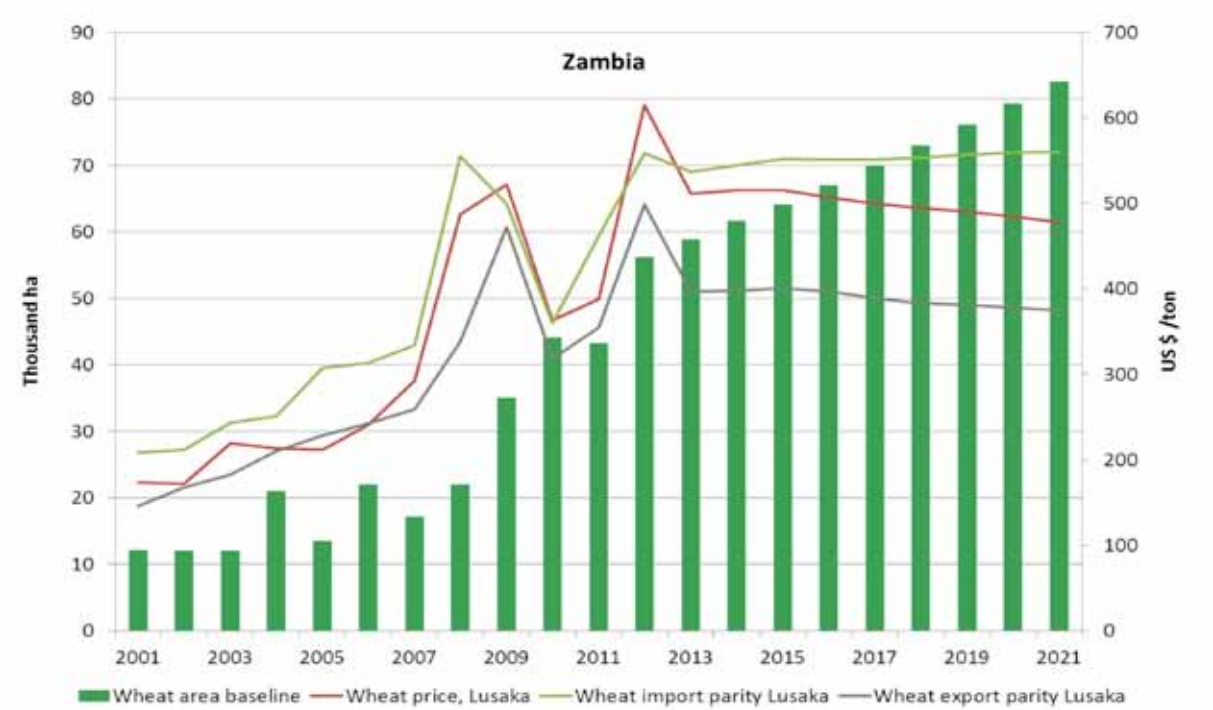


Figure 74: Zambian wheat area and prices

FIGURE 75 PORTRAYS THE switch in trade regimes, where Zambia has shifted from being a net importer of wheat to being a net exporter in the past couple of years. Total exports are anticipated to grow fast, reaching 200 000 tons in 2021. The growth rate in domestic consumption of wheat is anticipated to accelerate from an annual average of 4 % over the past decade to 5.3 % over the outlook period, as the rate of urbanisation increases. Zambia has the natural resource potential to produce significantly more wheat than is currently presented in this baseline. However, for this potential to be unlocked, government has to create a favourable environment for the private industry to invest.

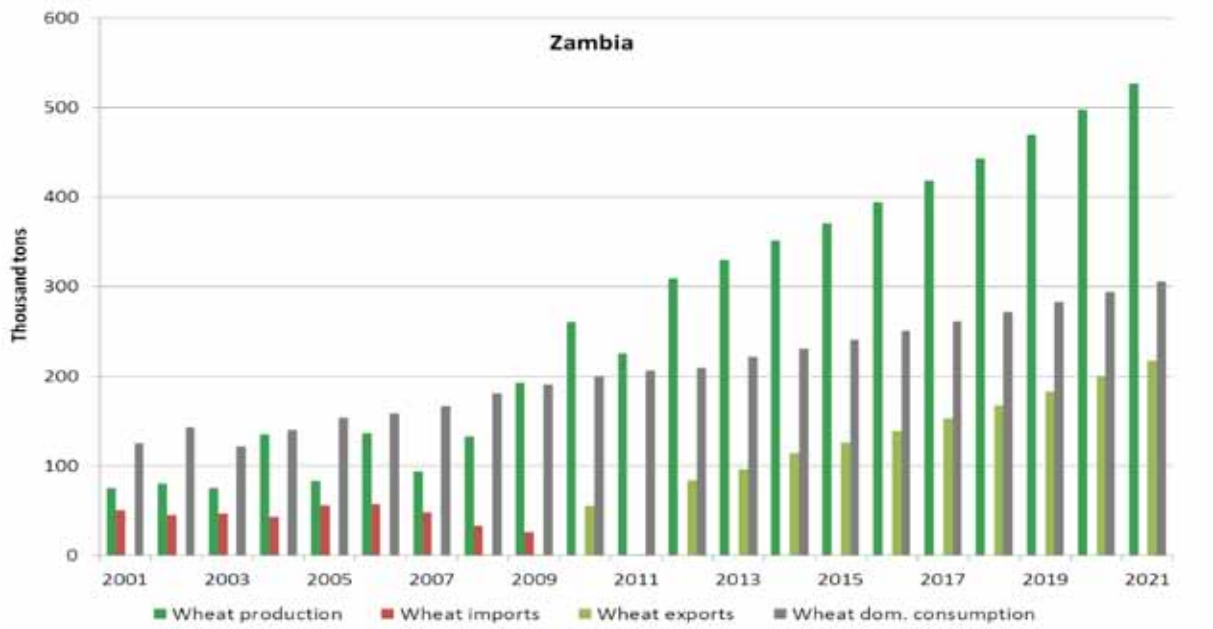


Figure 75: Zambian wheat production, consumption and trade

SUGAR SITUATION OUTLOOK

SUGARCANE AND SUGAR OUTLOOK

THE SUGAR MARKET IN Zambia is characterised by high concentration, with Illovo Sugar (Zambia Sugar Plc) holding about 90 % of the total market share while Consolidated Farming (Kafue Sugar) and Kalungwishi estates together make up about 10 % of the market share. The privately controlled sugar industry has in the recent past experienced unprecedented growth due to high FDI flows, which have seen massive expansion at existing sugar mills and estates. The total area under production jumped by 30 % from 2009 to 2010 and it is projected that the total area under production will expand to more than 40 000 ha over the baseline.

Sugarcane is manly supplied by sugar-producing companies through their estates (60 %), while about 40 % is sourced from out-growers incorporating mainly small-holder cane producers. Despite Zambia's low cost of producing sugar and being a net exporter, the commodity is sold at a high price in the domestic market due to a number of government interventions in local markets in order to support local producers.

Figure 76 presents the 10-year outlook for the area under sugarcane production in Zambia. Again, this is likely a conservative approach to what the true potential of sugarcane production in Zambia is, but a significant amount of investment is required to expand the industry and even more critical will be the development of efficient transportation routes to export the produce on to the world market, since Zambia is a land-locked country.

The domestic sugar price is expected to rise from 96 US cents/kg in 2011 to 106 US cents/kg in 2015, but is then expected to follow the forecast declining world market trends and trade softer in the outlying years of the baseline. Despite production surpluses, the domestic sugar price is anticipated to trade closer to import rather than export party prices over the outlook period due to government intervention in markets. High transaction costs and a highly concentrated market structure largely affect the observed price formation process

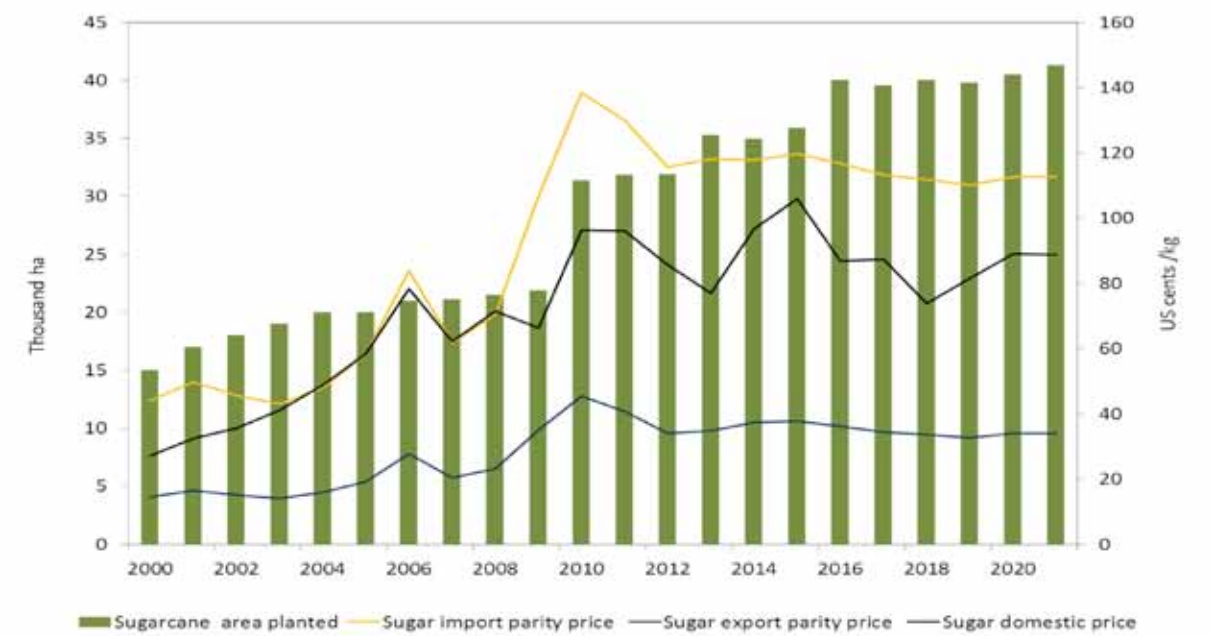


Figure 76: Zambia sugarcane area planted and sugar price
Source: BFAP, June 2012

SUGAR PRODUCTION IN ZAMBIA is expected to increase steadily from 415 000 tons in 2011 to reach 463 000 tons in 2015, further increasing to reach 515 000 tons by 2021. The main driver for the increase in output is the change in the EU sugar trade policy regime affecting African, Caribbean and Pacific (ACP) countries, including Zambia. Thus, the export quota for Zambia has been raised from the previous 28 000 tons per annum to 250 000 tons per annum (about 95 % of current production). Despite a cut in the guaranteed price by 32 %, the export quota presents Zambia with a great opportunity for export growth in the sugar sub-sector. In response, sugar millers (mainly Illovo and Kafue sugar) embarked on significant expansion of milling and estate capacity. The EU trade policy shift is also expected to support world market prices for sugar which further presents attractive market opportunities in all export destinations. Domestic, regional and international demand for Zambia's sugar is expected to increase through the period 2012 to 2021. High demand from the EU and regional markets coupled with high world prices will boost exports from the current 220 000 tons in 2011 to 232 000 tons by 2020. Sugar imports, however are expected to remain close to zero due to barriers such as Zambia's legislation requiring all direct consumption sugar to be fortified with Vitamin A in specific quantities. Potential sugar imports are highly regulated by the government through bureaucratic procedures requiring import permits to be cleared by three government ministries. The rise in per capita income is expected to increase domestic use from 194 800 in 2011 to 284 200 tons in 2021.

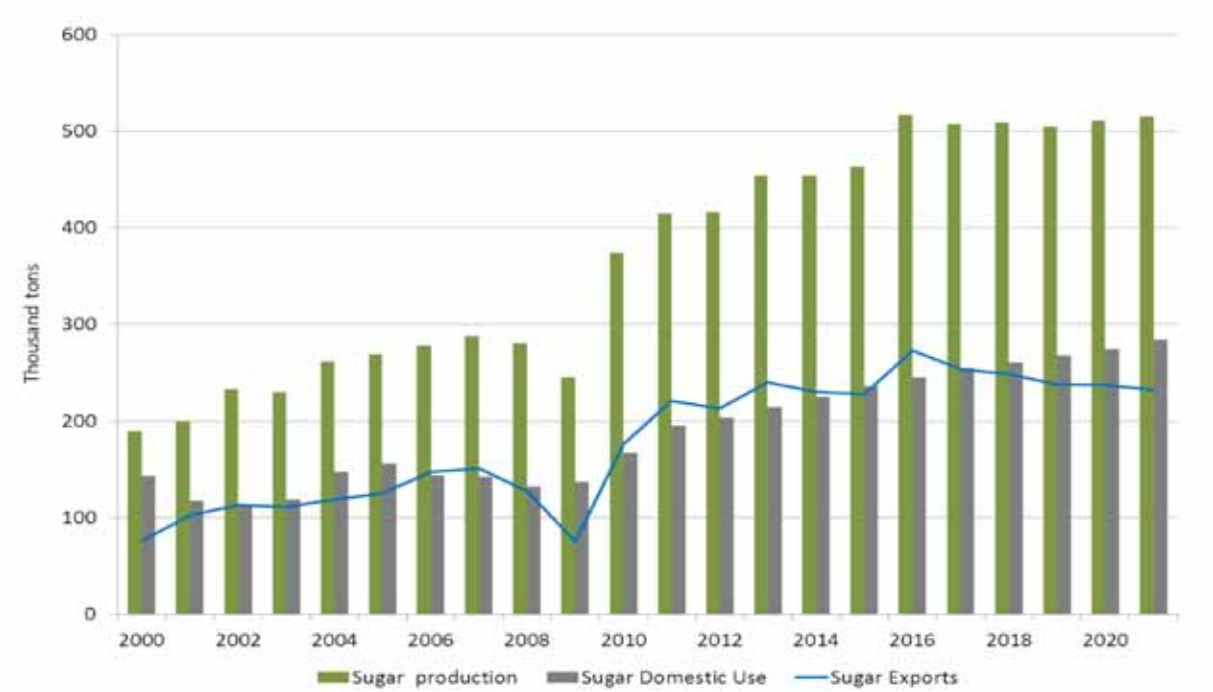


Figure 77: Zambia sugarcane area planted and sugar price
Source: BFAP, June 2012

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BFAP BASELINE AGRICULTURAL OUTLOOK

the impact of mining on agriculture

INTRODUCTION

SOUTH AFRICA HAS 1.5 % high potential arable soils[7] (soils best suited for cash crop production), of which Mpumalanga has 46.4 % of the country's total high potential arable soils. At the current rate of coal mining in Mpumalanga, it was calculated that approximately 12 % of South Africa's total high potential arable land will be transformed, while a further 13.6 % is currently being prospected by the mines in Mpumalanga. Current mining and new prospects for mining could soon have devastating effects on agricultural production as well as long term food security implications for the entire country. The adverse effects that mining has on the agricultural land has led to a decision by the Maize Trust to evaluate the effects of coal mining in Mpumalanga, starting within a pilot area, namely, Delmas, Ogies and Leandra. When considering the impact of mining on agriculture, one should not only consider the loss of land, but also the impact of mining on logistics, the rate of urbanisation, food production and prices, water quality, employment and a number of other factors.

The focus of this report was to develop a framework for evaluating these impacts, within the specified pilot area. The potential now exists for the pilot project to develop into a phase two, which will incorporate the entire Mpumalanga province. The pilot area identified is at the heart of South Africa's maize production, with average dry land maize yields ranging from 5t/ha up to 9t/ha.

[7] High potential soils have some limitations that reduce the choice of plants or require moderate conservation practices; it may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I (very high potential soils); the limitations are few and the practices are easy to apply

OVERVIEW OF CASH CROP PRODUCTION IN MPUMALANGA

FIGURE 78 SHOWS A reduction of 196 000 ha in the area planted to maize, while the area of soybeans increased by 148 000 ha in the same period. The reduction in maize plantings can be ascribed to rotational cropping with soybeans, but in view of the total area planted to maize, soybeans, sunflower and sorghum, it should be noted that the area decreased from 770 000 hectares to 680 000 hectares in 15 years, totalling a 90 000 hectare reduction.

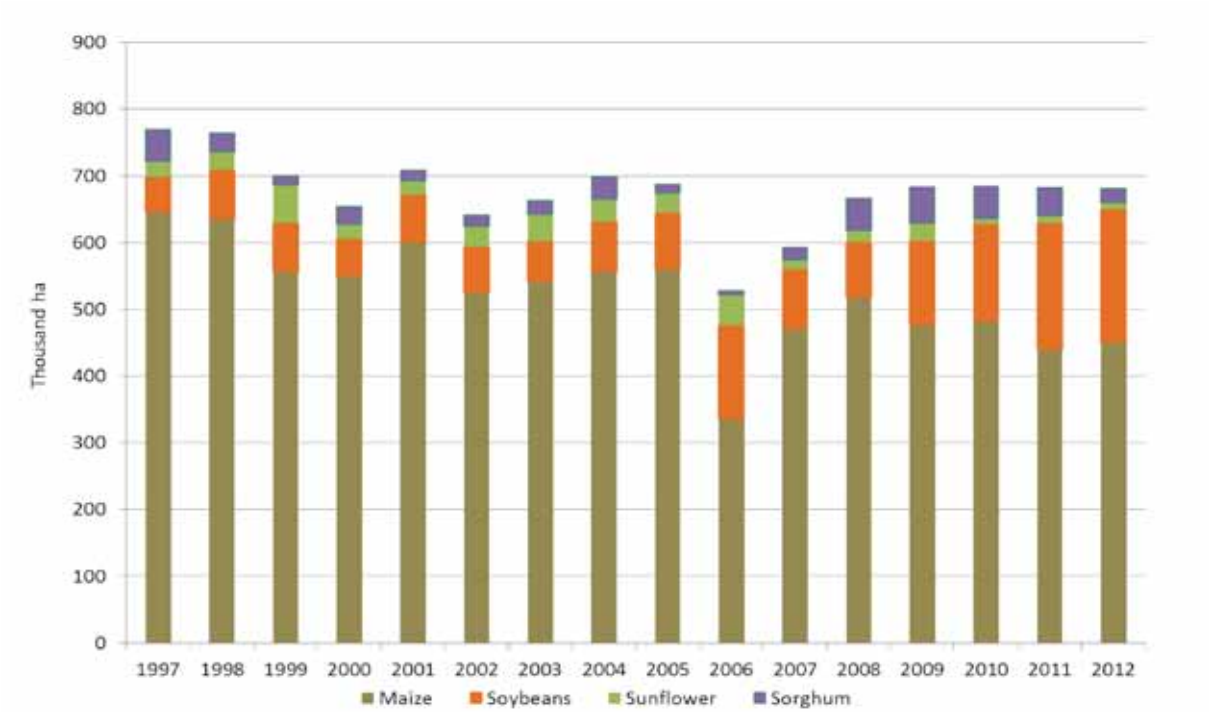

Figure 78: Mpumalanga cash crop production
Source: SAGIS 2012 & CEC

POSSIBLE TRANSFORMATIONS OF LAND BY MINING ACTIVITIES IN MPUMALANGA

BASED ON STATISTICS FROM AGIS (2011), it was calculated that 993 301 hectares of land were cultivated in Mpumalanga in 2007. If the current mining areas are overlaid with the latest field crop boundaries, a total of 326 022 ha will be lost to mining and a further 439 577 ha are at risk if the prospecting area is also transferred, totalling 765 599 hectares of cultivated land potentially transferred if all the mining activities take place as indicated by McCarthy et al. (2009).

According to the maps made available, mining and prospecting areas cover an extensive part of the Mpumalanga Province. According to Venter (2012), the interpretation of the maps and GIS data layers should be interpreted with caution. The following interpretation is proposed:

Mining or current mining includes all areas on which some form of mining operations exist or where there are mining rights. Some of these mines are operational and some are not.

New mining applications or prospecting areas include all areas for which applications for pros-

pecting permits have been received by the relevant departments and which have either been approved or are still being processed

It should be noted that although large farm portions are shown to be covered by mining operations or prospecting areas, only small areas of these farms will be subjected to mining and or prospecting. Applications for prospecting and mining rights are done over large areas in order to obtain a permit usually applicable only to a smaller portion or area within the larger area. In this sense, it might seem as if the maps displayed are an exaggerated picture of the actual reality, but there is still room for concern given that the mines will have to buy the entire piece of land. Furthermore, social and environmental impacts (e.g. air pollution, water pollution, crime, etc.) of mining activities on the region are in many instances so severe that farming activities cannot be sustained on the land that is left between all the mining activities.

Awareness of the current situation that potentially threatens the agricultural industry in Mpumalanga and ultimately South Africa is necessary to enable all the relevant stakeholders to act and ensure that land that has previously been set aside for agricultural use is protected.

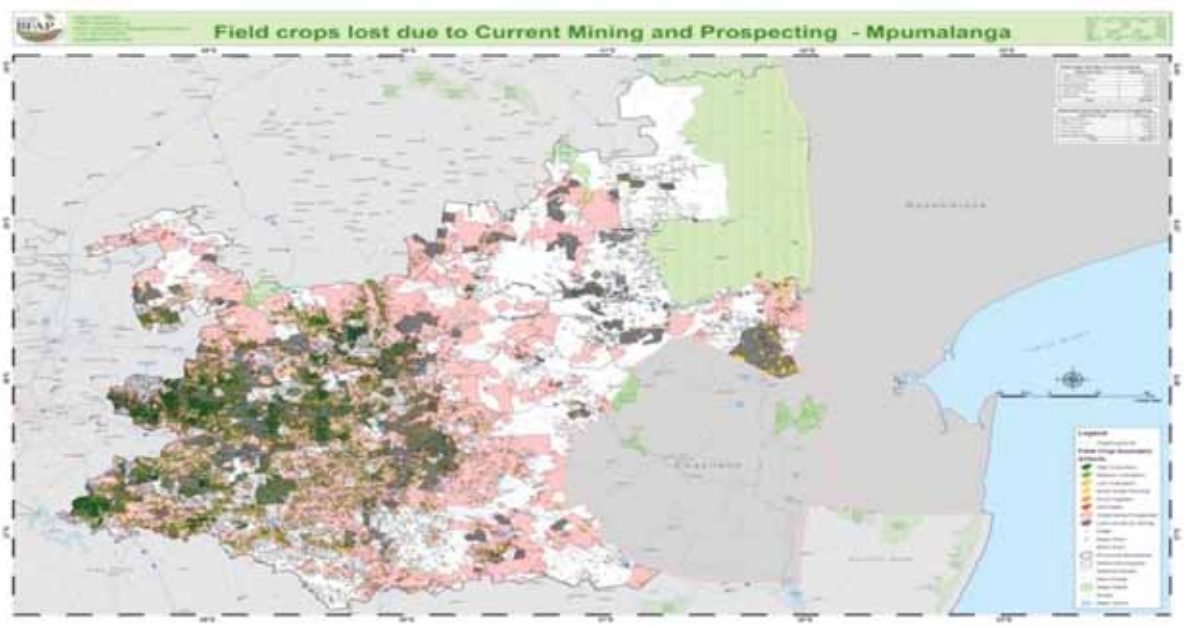

Figure 79: Field crop boundaries overlaid with mining activities
Source: DALA 2009, AGIS 2011, compiled by TIMS consulting for BFAP 2012

ARABLE LAND POTENTIALS

BASED ON THE FINDINGS from Schoeman et al. (2002), the entire Mpumalanga province has 12.1 % high potential arable land and 26.9 % moderate potential arable land. In total, South Africa has 1 878 750.13 ha (1.5 %) of high potential arable land (AGIS, 2011), and of this, Mpumalanga has 46.4 % or 872 007.6 ha (BFAP, 2011 compiled by TIMS consulting, 2011). Figure 80 shows the distribution of high potential arable land throughout South Africa.

The focus of this report was to develop a framework for evaluating these impacts, within the specified pilot area. The potential now exists for the pilot project to develop into a phase two, which will incorporate the entire Mpumalanga province. The pilot area identified is at the heart of South Africa's maize production, with average dry land maize yields ranging from 5t/ha up to 9t/ha.

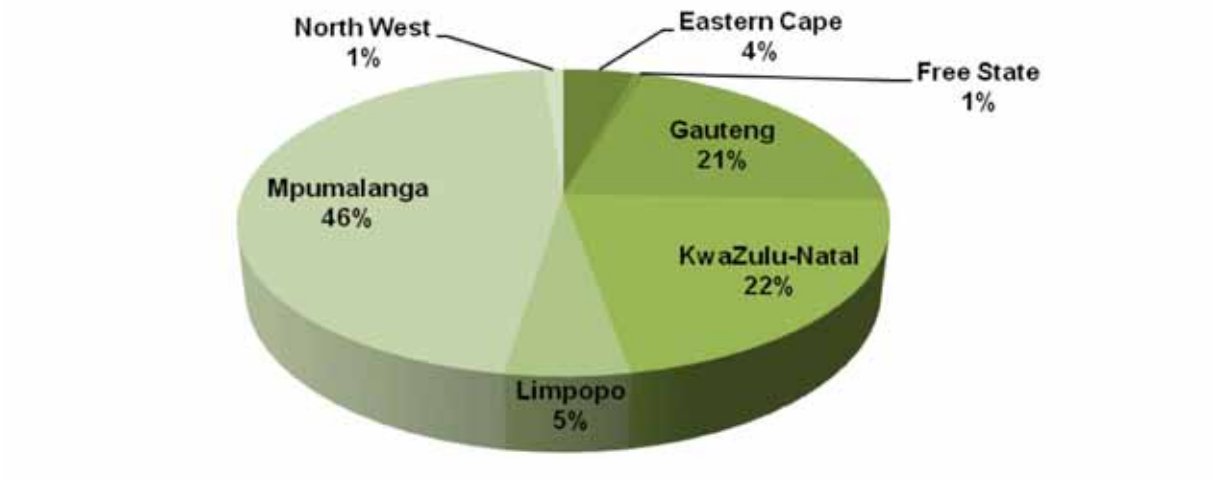

Figure 80: South Africa's distribution of high potential arable land
Source: Own calculations

PILOT STUDY AREA – DELMAS, OGIES AND LEANDRA

FIGURE 81 ILLUSTRATES THAT the pilot area has an approximated total area of 170 763 ha, of which 99 518 ha is made up of high potential arable land and 38 020 ha is classified as moderate potential arable land. Of the 170 763 hectares of land, 84 428 hectares are considered to have high to low cultivation taking place on them and a further 5 956 hectares can be regarded as pivot irrigated land. This area has approximately 5.3 % of South Africa's total high potential arable land, making it one of the most productive regions in South Africa.

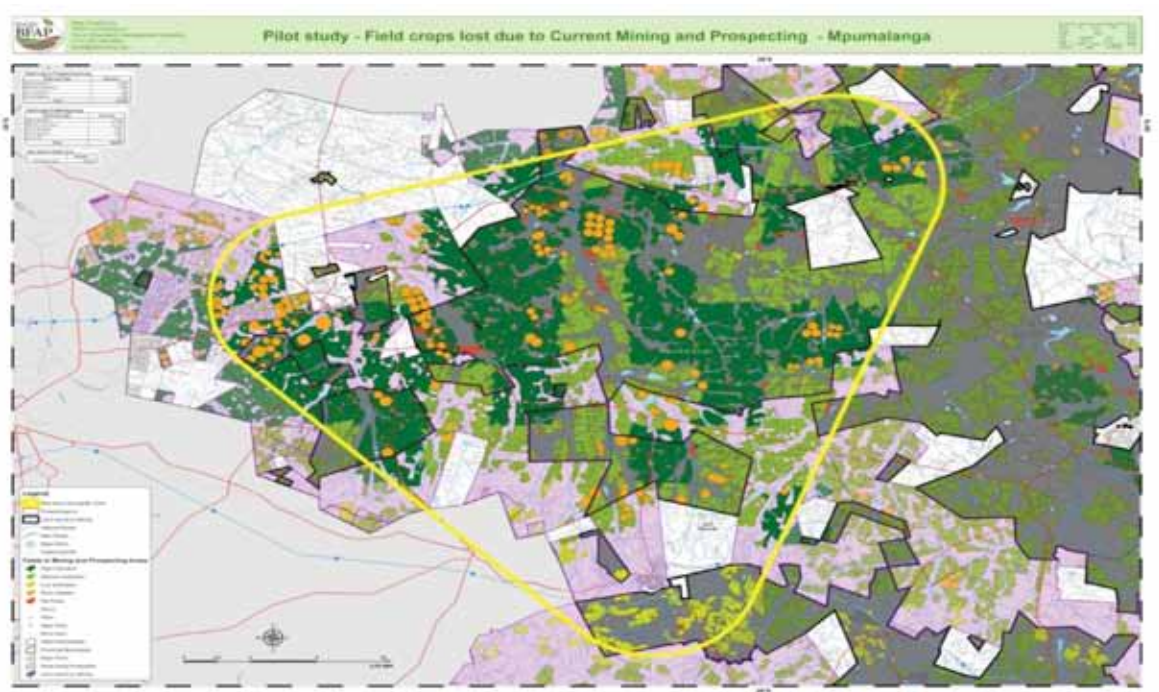

Figure 81: Pilot study area
Source: From Figure 80, Compiled by TIMS for BFAP 2012

THE TOTAL HIGH, MEDIUM and low cultivation hectares influenced by current mining are 27 431, 17 178 and 2 495 ha respectively, as well as 3 180 ha from pivot irrigation. Then from the proposed prospecting areas another 13 485, 12 448 and 638 ha, within the same field crop boundaries as mentioned, and 2 488 for irrigation can be affected. This was calculated by TIMS Consulting using ARC GIS mapping, with the field crop boundaries data provided by AGIS, 2011. For the purpose of this study, it was calculated that an approximate total of 79 967 ha (Figure 82) of the current cultivated land in the Delmas, Ogies and Leandra district will potentially be taken over by the mines. The time frame for this is uncertain, but the most likely scenario is that this area will be taken up by mining activities over the next ten to twenty years.

POTENTIAL LOSS IN MAIZE PRODUCTION

IN ORDER TO CALCULATE the loss in maize production, two scenarios had to be taken into consideration. The first set of tables illustrates the loss in production due to the current mining activities and the second section shows the effect if the area under prospecting is also taken into consideration. The tables were compiled based on the average of 75 % maize cropping for the Mpumalanga, and further 25 % soybeans.

Without taking expected yield improvements into consideration, it is estimated that approximately 447 581 tonnes of maize per year would be taken out of production from this area over the next 20 years, if all the current & proposed future mining (on prospected areas) takes place as displayed and calculated in Figure 81.

Table 10: Potential loss in maize production
Source: BFAP, 2012

Loss in maize production if current mining takes place				
	Hectares	**Potential t/ha**	**Ha if 75 % is maize (fig 1)**	**Tonnage**
High cultivation	27 431.0	8.5	20 573.3	174 872.6
Medium cultivation	17 178.0	6.5	12 883.5	83 742.8
Low cultivation	2 495.0	4.5	1 871.3	8 420.6
Pivot irrigation (assuming 40 % maize)	3 180.0	14.0	1 272.0	17 808.0
Total	50 284		36 600	284 844.0
Loss in maize production if prospecting also takes place				
	Hectares	**Potential t/ha**	**Ha if 75 % is maize (fig 1)**	**Tonnage**
High cultivation	13 485	8.5	10 113	85 966
Medium cultivation	12 448	6.5	9 336	60 684
Low cultivation	638	4.5	478	2 153
Pivot irrigation(assuming 40 % maize)	2 488	14.0	995	13 932
Total	**29 059**		**20 923**	**162 736**

POTENTIAL LOSS IN SOYBEAN PRODUCTION

ALTHOUGH THERE HAS BEEN a significant shift to expand soybean production in recent rotational cropping practises, a 25 % rotation of maize with soybeans was taken as an average for the purpose of illustrating the impacts. Based on this assumption, approximately 49 889 tons of soybeans would also be removed annually due to the same activities as calculated for the maize reductions.

Table 11: Potential loss in soybean production
Source: BFAP, 2012

Loss in Soybean production due to current mining				
	Hectares	**Potential t/ha**	**Ha if 25 % soy**	**Tonnage**
High Cultivation	27 431.0	2.5	6 857.8	17 144.4
Medium Cultivation	17 178.0	1.9	4 294.5	8 159.6
Low Cultivation	2 495.0	1.5	623.8	935.6
Pivot Irrigation (40 % Soybeans)	3 180.0	4.0	1 272.0	5 088.0
Total	50 284.0		13 048	31 327.6
Loss in Soybean production if prospecting also takes place				
	Hectares	**Potential t/ha**	**Ha if 25 % soy**	**Tonnage**
High Cultivation	13 485.0	2.5	3 371.3	8 428.1
Medium Cultivation	12 448.0	1.9	3 112.0	5 912.8
Low Cultivation	638.0	1.5	159.5	239.3
Pivot Irrigation(40 % Soybeans)	2 488.0	4.0	995.2	3 980.8
Total	29 059.0		7 638	18 561.0

AGAIN, CURRENT YIELD POTENTIALS are taken into consideration, and given the fact that soybean production has been replacing maize production in recent years the projected impact on soybean production presented in Table 11 is probably a conservative estimate.

TONNAGE REDUCTION – IMPACT ON MAIZE MARKET PRICES

THE BFAP SECTOR MODEL was used to provide an indication of the projected long-run impacts on maize markets if 447 581 tonnes of maize are taken out of the market. The shock was simulated in the model by gradually introducing a decline in the area under maize production. The total decline in the area under production towards 2020 amounted to 79 343 ha as calculated in Table 11.

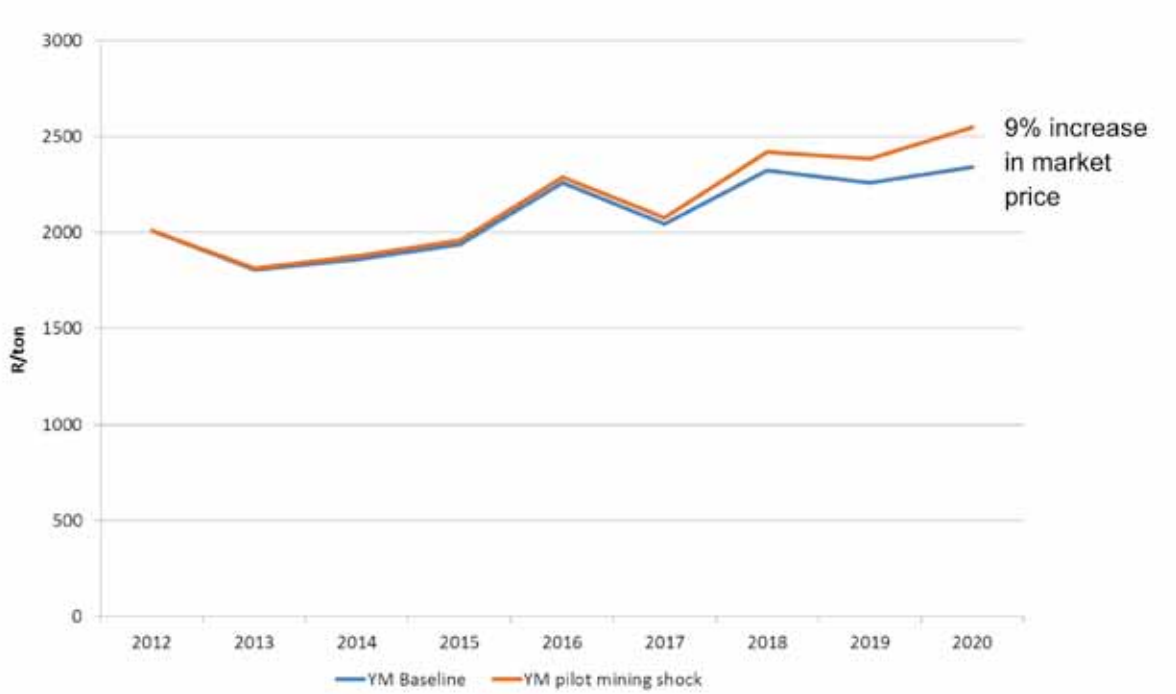

Figure 82: Impact of mining in the pilot area on national yellow maize market
Source: BFAP sector model, June 2012

TONNAGE REDUCTION – IMPACT ON MAIZE MARKET PRICES

IT IS IMPORTANT TO note that this is only the impact of the pilot area on the national market price; in other words, the loss of 79 343 ha of crop land. In a proposed second phase of the research, the magnitude of the impact on national maize markets will be significantly larger as preliminary indications are that approximately 400 000 ha of high potential land can be lost in total in Mpumalanga. If the anticipated rotational cropping practices bring soybeans up to 40 % of the total maize area over the long run, it implies that approximately 240 000 ha of high potential land will be lost to maize alone. At a conservative average yield estimate of 5 t/ha, this implies that 1.2 million tons of maize will be taken out of the market.

A number of calculations were further undertaken to illustrate the impact of mining on the pilot study area. For example, the agricultural total potential financial loss for the pilot area over the long run is estimated at approximately R3.4 billion. Since not all the land will be used for mining, the argument of farming of the residual plots of land also has to be considered, and apart from all the health and social impacts of living in the area that will be discussed at a later stage, here the economies of scale really matter. For example, if a total farming unit covers an area of 1 000 ha, and the mine acquisition comprises only 400ha, will the remaining land still justify the machinery costs and in turn, what effect will this have on the farm as an economic unit? The capital investment has already been made to produce on a much larger farm. In this specific example the loss in direct investment in machinery will amount to R1 316/ha. This was only an example drawn on direct machinery costs, and factors such as overheads, family living expenses and the decrease in total net farm income must still be taken into account.

CONCLUSION

THE STUDY HAS PROVIDED an overview of possible economic, environmental and social effects of mining in a pilot study area. Although the short-run economic impacts on farming level as well as medium impacts on maize markets were illustrated, a significant amount of research still has to be undertaken on the long-run macro-economic, environmental and social impacts. Both mining and agriculture play a critical role with respect to job creation and contribution to the gross value of output in the country. Over the short-run mining's contribution to the country's gross domestic product (GDP) exceeds the contribution of agriculture by a significant margin, yet over the long run, agricultural production are more sustainable. Therefore, the long-run impacts on food security and employment become even more important to understand. Food security has many elements, of which accessibility and affordability of food are the most critical drivers. In Mpumalanga's GVA (Gross Value Added) calculations, the mining sector makes a significant contribution towards employment and social empowerment. The average GVA for the mining sector in Mpumalanga over the period 1996–2010 was 21.9 %, whereas agricultures average GVA for the same period was 3.8 % (Quantec, 2011). Over the next few years, this trend will continue, yet the important question to raise is what will happen to the GVA of the province when all the mineral resources have been depleted, and the rehabilitated land can only support marginal agricultural production at best?

As already mentioned, the short-run economic contribution is not the only trade-off as the long-run environmental and social impacts cannot be quantified with absolute certainty yet. Other elements like the production of electricity and fuel out of coal cannot be left out of consideration. However, through innovative policies agriculture can also make a meaningful and sustainable contribution to both fuel and energy production over the long run, despite the fact that, over the short run, coal offers a significantly cheaper source of energy. The Highveld (and the entire Mpumalanga) is expected to receive increased levels of precipitation, according to the CSIR (in Blignaut C.S., 2012:176) as well as an increase in heat units. The yields in maize are then expected to increase even more with improved technology, rotational cropping with soybeans, improved cultivation practises, and combined with the increased precipitation and heat units. These long-run impacts will have to be researched and carefully balanced options proposed to government to ensure that the best decisions are taken now for the future generations of this country.

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