Intraw

International Raw Materials Observatory

Fostering international raw materials cooperation

Republic of South Africa

Contextual analysis of the reference countries

December 2015

Abstract

The principal objectives of the INTRAW project (http://intraw.eu) are the mapping of best practices and boosting of cooperation opportunities related to raw materials between the EU and 5 technologically advanced non-EU countries (Australia, Canada, Japan, South Africa and the United States). Each of these five "Reference Countries" is subject to similar global challenges. This report presents the contextual analysis of the Republic of South Africa (RSA) in order to explain the country´s historical economic development during the 20th and 21st century in general, and in relation to development of primary raw materials in particular. Three reports focussing specifically on: raw materials research and innovation; education and outreach; and industry and trade in the Reference Countries will be the next outputs from the project to be published. These will underpin the development of a better understanding of the achievements made in these 5 countries in relation to raw materials research & innovation, educational and skills programmes, trade, exploration, exploitation, processing, recycling and substitution.

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Acknowledgements

The authors thank Fatheela Brovko, Ray Durrheim, Navin Singh, Emma Van Garderen and Benita De Wet for their help in reviewing this report, acknowledge all the Experts who provided very useful insights and comments to the Summary Report during the Bled Workshop and the Consortium Partners who also provided valuable input, and thank Ruth Allington, Dylan McFarlane and Matt Wenham for the English proofreading.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n° 642130.

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1. Introduction

1.1 General

One objective of INTRAW is to characterise the contextual environment of the 5 Reference Countries for the project (Australia, Canada, Japan, South Africa and the United States) in relation to raw materials research & innovation, educational and skills programmes, trade, exploration, exploitation, processing, recycling and substitution. This, together with the mapping of corresponding policies and practices for each of these domains, will facilitate the comparative evaluation and cross impact analysis of the raw materials domains between the Reference countries and the EU.

1.2 Introduction to Contextual Analysis (WP1, Task 1.1)

The objective of Task 1.1 of the INTRAW project is to map the contextual environment of the reference countries (Australia, Canada, Japan, South Africa and the United States of America) against the contextual environment in the EU, leading to a better understanding of the achievements made in these countries in relation to *raw materials research & innovation, educational and skills programmes, trade, exploration, exploitation, processing, recycling and substitution*. This WP will also map the corresponding policies and practices of each of these domains. The data will be centrally processed, which will facilitate the comparative evaluation and cross impact analysis of the raw materials domains in each of the Reference countries and the EU.

1.3 Scope of this report

This report is the **Country Report for the Republic of South Africa (RSA), prepared as part of Task 1.1: *"Contextual analysis of the Reference Countries"*.** It is part of the deliverable for Work Package 1 of the INTRAW project (D1.2). This report on the contextual analysis for South Africa is presented in 4 main sections after this introduction:

- **Chapter 2:** An Executive Summary
- **Chapter 3:** A historical overview on raw materials
- **Chapters 4 to 8:** Analysis of the contextual environment, covering 49 explanatory factors, grouped into five main categories:
  - Geo & Environmental (6 factors – Chapter 4);
  - Socio-Cultural (11 factors – Chapter 5);
  - Economic (14 factors – Chapter 6);
  - Political and Legal (14 factors – Chapter 7); and
  - Technological (4 factors – Chapter 8).
- **Chapter 9:** Conclusions.

The description of the analysis of the contextual environment in each of the main sections, Chapters 4 to 8, first describes general economic growth and change drivers associated with each of the explanatory factors, and then draws out findings that are specific to the non-energy raw materials sector. The conclusions section follows a similar pattern, with a general overview followed by conclusions specific to raw materials, arranged under the headings "*Industry and trade*", "*Education and outreach*", and "*Research and innovation*" thus integrating three sides of the 'knowledge triangle': higher education, research and business, that are reflected in the themes of the sector specific reports being prepared as deliverables from WPs 1.2[1], 1.3[2] and 1.4[3].

The report is supported by three appendices:

- **Appendix A1:**
  Presentation of the method employed to construct a multi-factor matrix and associated radar charts. The multi-factor matrix and radar charts were the tools used to carry out initial organisation and analysis of the information collected and to inform discussions within

1 Transactional analysis on Research and Innovation
2 Transactional analysis on Education and Outreach
3 Transactional analysis on Industry and Trade

the work package team and with members of the expert panel. They are considered as *work-in-progress input* and are included here for completeness.

- **Appendix A2:**
  Presentation of summary findings *via* the "multi-factor matrix" and five- and 12- axis "radar charts", and preliminary discussion of the comparative importance of the explanatory factors based on the analysis.
- **Appendix A3:**
  Presents the references quoted in this document.

2. Executive summary

Before the advent of European settlers South Africa was mainly a primitive society. Initially the economy was solely agrarian but later on with the discovery of world class diamond and gold mines in the latter half of 19th century, the economy started transforming into a modern and industrial economy. The establishment of an internationally competitive market and a globalized economy in South Africa took place in very recent times given that up until 1990 the political and social scenario of the country was overshadowed by apartheid. Today South Africa consists of world-class mining companies not only in gold, platinum, diamonds, but also coal, ferrochrome and base metals. The industry is served by world-class engineering and other support companies that export the respective services and products.

At a Geo political level it can be observed that South Africa is located at the southern tip of the African continent and is a part of a major shipping route between Europe and Asia which leads around the Cape of Good Hope, with Cape Town as a major port of call. South Africa thus is exposed to both the Atlantic and Indian Ocean providing substantial opportunities for industrial trade. South Africa is one of the BRICS countries (Brazil, the Russian Federation, India, China and South Africa). In terms of economic geography, the country can be summarized as a middle-income, emerging market with an abundant supply of natural resources; well-developed financial, legal, communications, energy, and transport sectors, and a stock exchange that is Africa's largest and among the top 20 in the world. Even though the country's modern infrastructure supports a relatively efficient distribution of goods to major urban centres throughout the region, unstable electricity supplies retard growth. Economic growth has decelerated lately. Unemployment, poverty, and inequality - among the highest in the world - remain one of the biggest challenges of the country.

In recent times, the investor friendly policies of the country have made South Africa by far the largest recipient of foreign direct investment in Africa. Nearly half the entries involved acquisitions of existing operations, rather than Greenfields or joint ventures setting up new enterprises. Many investors mitigated risk by limiting the irreversibility of their investment, by outsourcing production and focussing on services. Most entries are market-seeking.

In terms of public revenue, unlike in many other developing countries, by far the bulk of national government revenue consists of tax revenue, while transfers and ordinary income from the sale of goods and services are comparatively insignificant. The annual volume of capital investment by public enterprises has increased considerably in real terms over the past decade.

Local government's annual infrastructure spending has more than doubled in real terms since the late 1990s. The government has significantly increased social expenditure, notably in the expansion of social assistance grants. South Africa is a relatively open economy, only 'moderately' protected by tariffs. Compared to its trading partners, the tariff regime is quite transparent and not overly complex.

For development in the field of research, the country's Medium Term Strategic Framework for 2014-2019 (MTSF, 2013) emphasises the need to build on the current range of strategies and programmes that are already supporting innovation in firms and research and development (R&D) in the private and public sectors, with emphasis on biotechnology and pharmaceuticals, space science and technology, energy security, and other needs presented by climate change. This seems to be a positive step in long term development of R&D and innovation in the country. The South African government continues to emphasise the importance of ICTs and their contribution to the

country's economic growth, specifically in the broad framework for economic policy as set out in the Accelerated and Shared Growth Initiative of South Africa.

With regards to the mining industry, South Africa has managed (during the apartheid era) to develop based on a legal framework favourable to big mining companies and a monopolised structure. This has been attempted to be changed after 1994 (post-apartheid era) by reverting mineral rights to the State, allowing new entrants into the market by new exploration and mining licences. Also a stable fiscal framework, pre- and post-apartheid has been instrumental in enabling the success of the mining industry. A key feature has been the allowance of the repatriation of profits for all industries. Also permitting times in South Africa have acted as an incentive, i.e. permitting takes on average currently 12 months for exploration licenses, and the conversion between the exploration and the mining permit is straightforward, providing security of tenure. South Africa also managed to develop a skilled workforce (e.g. skilled engineers in shaft sinking, ventilation, rock engineering and scientists) that made deep level mining possible. But after 1994 many skilled workers have moved abroad. This remains a challenge, alongside the increasing mechanisation of operations, also requiring more skilled workforce.

To ensure the future success of mining in South Africa, the stability of the legislative environment is important. Apart from the legislative environment, access to land, energy and water will also play an important role for this sector. In terms of the energy sector, in the past there was sufficient supply of water and energy. At present, with increasing population and as a result of urbanisation the supply of energy and water are constrained due to increased demand. This challenge is recognised by the South African government, and efforts are being made to increase the energy output. For future success in mining, efficient mining methods that use water and energy sparingly are required.

In terms of the financial development of the mining sector post-1994, companies were able to invest globally and spread risks and, in so doing, became global mining companies. Acquisitions and mergers took place, head offices moved offshore, and mining companies were able to list on international stock exchanges. Also, since mining still remains a labour sensitive sector, since 1994 there has been strong wage pressure and a decline in the mining workforce. This trend is likely to continue in the future, with an increased drive for modernisation and mechanisation. Labour cost is currently also very high and labour availability is unreliable due to continued tensions between employers and the workforce and with frequent and long term strikes; this currently represents a significant challenge. Other challenges lay in the quality of the rail and road infrastructure, in the perspectives of resource nationalism and in increasing the added-value of extracted minerals, an issue that is in the political agenda and will remain an important topic.

3. Historical overview on raw materials

Prior to European settlement, South Africa's native population were mainly hunter-gatherers and migrant animal herders with limited sedentarized agriculture. Early European settlers brought with them new agricultural models and methods, including sedentarization of agriculture, with fencing and, eventually, fixed water points. The discovery of world-class diamond and gold deposits in the latter half of the 19th century laid the foundations for the transformation of South Africa from an essentially agricultural to a modern industrial economy. South Africa has an exceptional mineral resource endowment, more than just diamonds and gold, and mining remains the backstay of the economy.

Due to the apartheid regime, the increasing political isolation of South Africa was also reflected in the economic and corporate governance structures as well as the ways in which the economy related to world-wide markets. In the apartheid system the people of South Africa were divided by their race and the races were forced to live apart from each other. There were laws that kept up the racial separation. Management and workplace practices, reflecting the colonial and apartheid eras, were far behind international standards. A fundamental change in public and corporate governance paradigms slowly took place with a view to bring South Africa in line with international expectations in a process that is ongoing.

Such transformation affects not just the whole country, but also the raw materials industry specifically, with changes to company-work force relationships, attitudes to workplace safety, and social aspects of the labour force and their families. A leaner, more focused, more competitive and internationally active industry ideally emerged. Today in South Africa there are world-class mining companies not only in gold, platinum, diamonds, but also coal, ferrochrome and base metals. The industry is served by world-class engineering and other support companies that export their respective services and products. Thus, mining contributes not only directly to the economy, but also indirectly through upstream and downstream activities.

Overall, the South African mining industry is the fifth largest in the world (Antin, 2013). Today, the mining industry is fully integrated into and capitalised on the international markets. This integration comes, however, at the cost of being affected by global financial crises, such as the global downturn from 2008 onwards. While the opening-up and re-integration of the South African economy into the world market has led to substantial capital flight in the early years after 1990, it also facilitated the inflow of foreign capital and the internationalisation of previously largely domestic firms (McKenzie and Pons-Vignon, 2012:6-7).

Production volumes in the minerals sector and revenues earned from them strongly depends on the movements of the global markets. Platinum group metals (PGMs) have been for many years the highest revenue-earning commodity in South Africa. However, as the demand for platinum is highly dependent on the demand from the automotive sector, where it is used mainly in catalytic converters, the fall in production of cars in recent years has also reduced the demand for PGMs. Coal overtook PGMs in terms of revenue generated for mining companies, though most of the coal is consumed domestically, particularly for electricity generation (PwC, 2012:5).

South Africa has the world's largest resources of platinum group metals (87.7% of world total), manganese (80%), chromium (72.4%), gold (29.7%), alumina-silicates and accounts for over 40% of global production of ferrochromium, platinum group metals and vanadium (GCIS, 2013:151).

It is interesting to relate the amount of minerals produced per annum in any one country to its reserves and then to compare this figure with other countries. A world market share in production that is

close to world share in resources generally indicates a well-established industry. A disparity is exemplified by the manganese production, where South Africa has a market share of 15% compared to the 30% of China that has only 1.25% of the resources compared to the former. These figures may indicate also differences in the respective economic policies of the countries.

The vast majority of South Africa's mineral production is exported, with the exception of coal that is mainly used for domestic electricity production.

4. Geo and environmental factors

4.1 Geographical situation

South Africa is located at the southern tip of the African continent. Although its location is peripheral with respect to on-land communications, a major shipping route between Europe and Asia leads around the Cape of Good Hope, with Cape Town as a major port of call.

Figure 1: Road transport network in the SADC.

Source: www.sadc.int/themes/infrastructure/transport/roads-road-transport/

South Africa thus is exposed to both the Atlantic and Indian Ocean. Major seaports are Cape Town, Durban (container terminal), Port Elizabeth, Richards Bay, Saldanha Bay, and Mossels Bay as a terminal for Liquefied Natural Gas (LNG) imports. South Africa has common borders with Namibia, Botswana, Zimbabwe, and Mozambique. The independent states of Lesotho and Swaziland (which also has a border with Mozambique) form enclaves within the South African territory. South Africa provides important transit routes for these two countries as well as for the land-locked countries of Botswana and Zimbabwe. The latter also has access to the coast through Mozambique and the port of Beira.

Figure 1 and ***Figure 2*** illustrate the major road network and transit corridors in the Southern African Development Community. The peripheral position of South Africa with limited connections between countries means that it cannot profit to a great extent from transit. Ties with Namibia, Zimbabwe, Swaziland, Botswana and Lesotho are historically close.

4.2 Natural & Mineral resources

South Africa is one of the countries with the richest endowments of minerals. As mentioned previously, the country has more than half of the world's reserves of manganese, chromium and platinum group metals. It also has 40% or more of the world's vanadium, gold and vermiculite reserves. Apart from being one of the world's largest producer of platinum, manganese, chromium and vanadium and a major producer of gold, South Africa is one of the world's biggest producers and exporters of steam coal, although

Figure 2: Major roads in South Africa.

Source: http://www.sa-venues.com/maps/south-africa-national-roads.htm

much of the coal is being used domestically. The country produces 80% of its steel needs, the rest comprising of imported speciality steel products. The steel is manufactured from domestic sources of iron ore, chromium, manganese, and vanadium, using locally produced coke and powering the electric furnaces by coal-fired power stations. South Africa is also nearly self-sufficient in cement and building aggregates (GCIS, 2013).

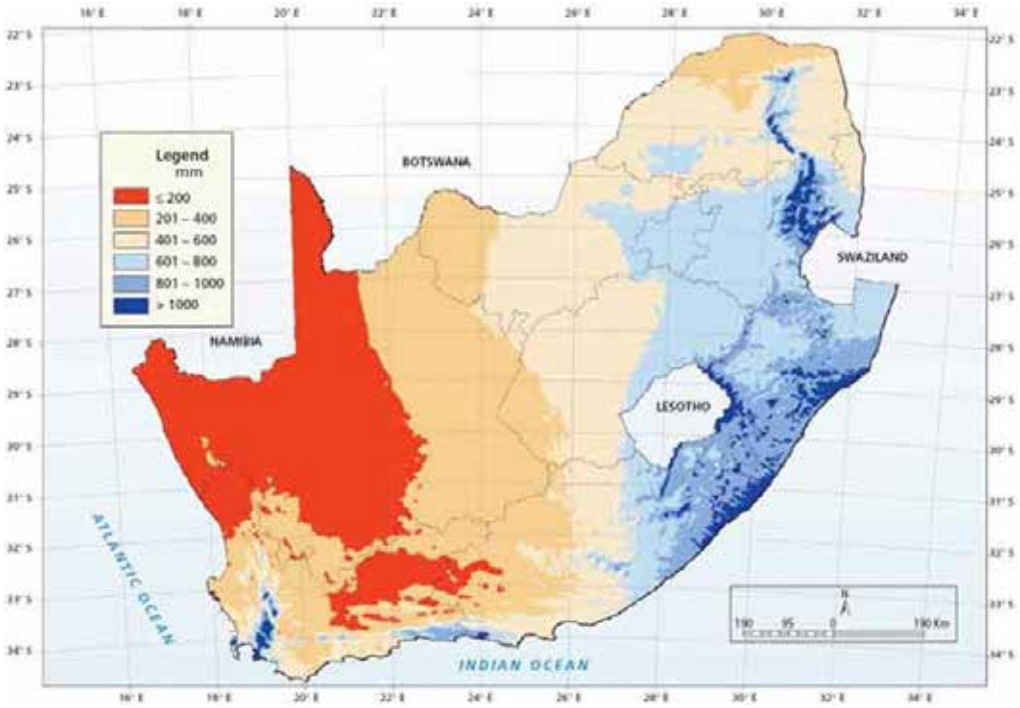
4.3 Water resources

Water is a scarce commodity in South Africa with an average annual rainfall of approximately 464 mm compared to a world average of 860 mm. Long before external stressors such as climate change are taken into account, it is already highly water stressed (for example, the Limpopo Basin is one of the most severely water stressed river basins on the African continent). It also has one of the lowest Mean Annual Precipitation to Run-off conversion ratios in the world, meaning that much of the land is arid. The water resources are also unevenly distributed geographically, reflecting the climatic transition from moderate in the South to subtropical in the North (***Figures 3 and 4***).

South Africa experiences significant water resources challenges due to increasing population (drinking water, increasing energy demand that requires more cooling water for the power-stations), expanding industry (process and cooling water), competitive land-uses (e.g. strip-mining for coal) that may destroy aquifers, as well as intensified agriculture to meet rising domestic demands due to increasing population with increasing wealth. The effects of climate change may further worsen the situation, and such stressors affect both water quality and quantity.

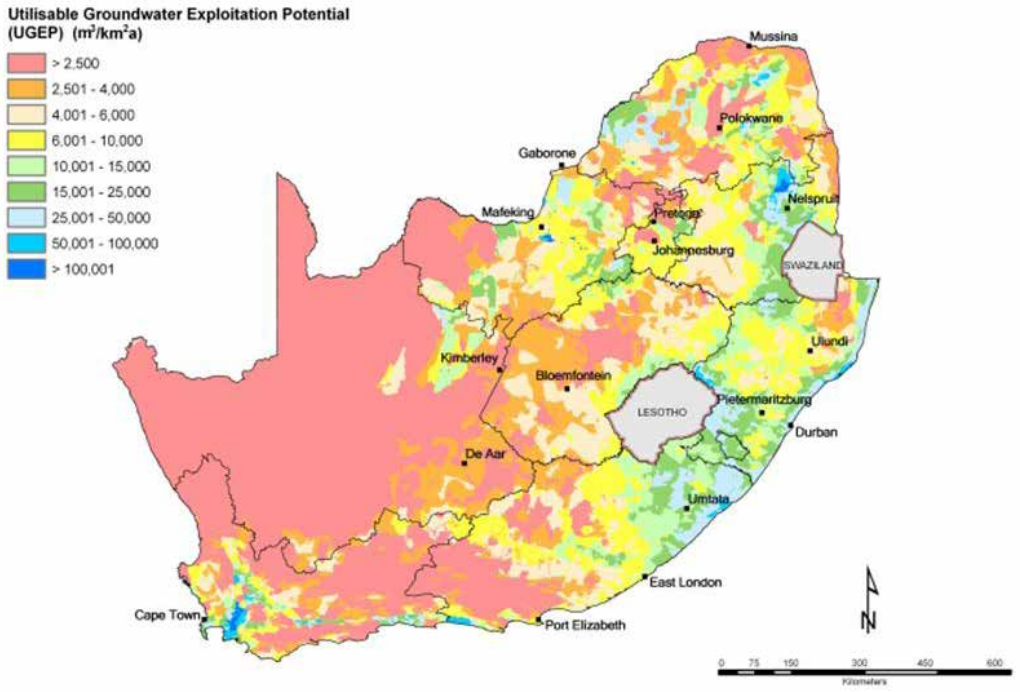
Aquatic ecosystems play an important role in the hydrological cycle, both in quantitative and qualitative respects. Of the 112 river ecosystems in the country 84% are considered threatened,

Figure 3: Average annual rainfall.



Source: www.fao.org/docrep/008/y5998e/y5998e02.jpg

Figure 4: Groundwater exploitation potential.



Source: www.dwa.gov.za/Groundwater/Documents/map/ugep.jpg

of which 54% are critically endangered, 18% endangered, and 12% vulnerable. Also, more than 50% of the wetlands are degraded (WESSA, 2012). Ground- and surface water in a number of areas also have longstanding and emerging quality problems due to (amongst other factors) mining, industrial activities, and intensive farming. The South African government addresses these issues through a groundwater strategy (Water Affairs, 2010), but while the water strategy of the country is impressive, implementation remains difficult.

4.4 Climate

Climate change resulting from global warming is likely to affect the largely arid regions of South Africa. Reduced rainfall would reduce groundwater recharge and hence put further stress onto the water resources exploited to their sustainable limit. Receding groundwater levels will also have impacts on the natural vegetation and agriculture. Where reduced vegetation cover occurs, it is likely to expose the land to erosion by flash-floods, which could trigger a cycle of desertification. Climate change models, such as those in Davis (2011) show an increase in projected mean, minimum and maximum temperatures as a consistent and robust finding – with a minimum projected change of 0.3°C, and maximum at 3.6°C. The models indicate increases in very hot days or heat waves. A decrease in winter and spring rainfall over the south-western part of South Africa is also indicated in most simulations, whereas south-eastern South Africa generally is expected to receive more rainfall.

Both water shortages and erosion will have profound socio-economic effects, amongst other impacts. Not only is it likely to become increasingly difficult to supply an increasing population with drinking water, but also to provide industry, including the mining industry, with water. Conflicts over water use are likely to arise, particularly (but not solely) in the western parts of South Africa that receive less rain (Davis, 2011). Nature-based tourism in southern Africa is at risk from climate change due to the effects of changing temperature and rainfall patterns on species distribution, as well as indirect effects. Finally, the health sector in South Africa is likely to be increasingly challenged by climate change, including thermal stress on humans – with significant concerns for both open and deep level mining (see, for example, Archer and Tadross, 2009). A comprehensive Risk and Vulnerability Atlas is available for South Africa (http://sarva.dirisa.org).

4.5 Geological Factors

Southern Africa is host to two large Mesozoic flood volcanic provinces - the early Jurassic Karoo Province and the early Cretaceous Etendeka Province along the Atlantic seaboard of South Africa and Namibia. The south-western Cape has one of the highest levels of seismicity in South Africa. However, serious earthquakes are rare with the most severe earthquake of magnitude 6.3 having occurred on 29 September 1969 in Ceres, 100 km northeast of Cape Town. The event resulted in 12 lost lives and numerous damaged buildings in the town of Tulbagh. On 4 September 1809, a seismic event estimated at magnitude 6.3, occurred at the Milnerton Fault, a mere 10km from Cape Town CBD and the location of the Cape Town Stadium (Visser and Kijko, 2010). Earthquakes of anthropogenic root cause are much more frequent, resulting from mine works that have been abandoned and left to collapse, or triggered by mining at great depths. They affect particularly townships and former mine land that has been settled informally (Visser and Kijko, 2010).

4.6 Ecologically sensitive areas

South Africa has eight UNESCO-designated biosphere reserves (***Table 1***).

In addition, South Africa has several UNESCO World Natural Heritage Sites. The recently designated Gouritz Cluster with an area of more than 3 million ha straddles two provinces as does the second largest Kruger to Canyons Biosphere Reserve with its 2,474,700 ha. The latter includes the well-known Kruger National Park. It should be noted that the surface areas given in ***Table 1*** are the total area, which includes a much smaller core area, a buffer area, and a larger transition area. Most of the designated biosphere reserves include settled land and are under pressure from informal settlements and expanding subsistence agriculture. There have been debates and disputes around mining leases near World Heritage Sites, e.g. a coal mine adjacent to the Mapungubwe heritage site (ancient cultural landscape) in Limpopo, and with respect to illegal mining, e.g. sand mining along the Wild Coast. Besides the Biosphere reserves, there are 17 Ramsar sites in South Africa, also considered ecologically sensitive areas.

Table 1: UNESCO Biosphere Reserves.

Name	Province	Year of designation	Total area [ha]	Administrative authority
Kogelberg	Western Cape	1998	103,629	Cape Nature Conservation, Hangklip/Kleinmond Municipality
Cape West Coast	Western Cape	2000, extension 2003	378,240	Provincial Administration Western Cape
Waterberg	Limpopo	2001	414,571	The Waterberg Biosphere Reserve Committee
Kruger to Canyons	Limpopo and Mpumalanga	2001	2,474,700	National Department of Environmental Affairs and Tourism, Kruger to Canyons Biosphere Reserve Trust
Cape Winelands	Western Cape	2007	322,030	Cape Winelands District Municipality
Vhembe	Limpopo	2009	30,701	Limpopo Provincial Government, Polokwane
Gouritz Cluster	Eastern and Western Cape Provinces	2015	3,187,893	National Department of Environmental Affairs
Magaliesberg	Gauteng	2015	357,870	Magaliesberg Management Board

Source: www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/africa/south_africa/

5. Socio-cultural factors

5.1 Historical Background

The Portuguese, who were the first European to arrive in South Africa, left little traces of their presence. From the 17th century the Dutch East India Company (VOC) used Cape Town as a stepping stone along the trade route to India and East Asia. Religious and political refugees from the Netherlands, Germany, and France (Huguenots) arrived in considerable numbers as farmers and spread from the Cape area into the land. Their Protestant ethics and the Dutch language are still a dominating factor in the white population of South Africa. In the wake of the Napoleonic Wars the British Empire seized the Cape Colony from the Dutch. This led to an inflow of British administrators, business people, and settlers, resulting in antagonism between the Boers and the British that persisted into the early 20th century, culminating in the Anglo-Boer Wars (1899-1902).

South Africa's transformation from an agricultural society to the most industrialized nation in Africa began in the Witwatersrand Basin in the late 19th century. The world's largest diamond deposits had already been discovered in the 1860s around the area that later became the city of Kimberley in the Northern Cape Province. Diamond mining and trade became monopolised by the De Beers company (a situation that largely persists until recently), but generated sufficient revenue for the development of a railway system. The labour- and capital-intensive deep mining for gold began to shape the future economic trajectory of South Africa.

The mineral resources were developed with mainly British capital. Land-use conflicts between the more agriculturally oriented Boers and the industrially oriented British led to the so-called Anglo-Boer Wars. Supply of mine labour became a development priority and policies to attract Africans into the urban mining centres were put into place. However, bringing a large population of mainly male mine contract workers into the town regions without integrating them into the social fabric eventually led to the segregationist policies of 'apartheid'.

The discovery of gold in South Africa drove the foundation and rise of mining houses. Their purpose was to acquire capital with a particular focus attracting foreign investment. For instance, Anglo American was founded to mobilise capital from British and American investors (Segal and Malherbe, 2000). To strengthen their position against global competition and with the government, the major mining houses – including Anglo American, De Beers, Goldfields and Harmony - created the Chamber of Mines, which went on to dominate the economy up until the 1990s. The mining houses created the South African capital markets by functioning as investment banks, pioneered other mineral resources besides gold, and used their economies of scale to centrally purchase material, employ highly skilled labour, and to monopolize the unskilled labour market.

The increasing political isolation of South Africa from the 1970s onwards negatively affected the mining businesses and forced them to re-orient their recruitment policies. While previously large numbers of unskilled labourers had been brought into from neighbouring countries, now these workers had to be recruited locally (Segal and Malherbe, 2000).

Social relations also changed with the establishment of the National Union of Mineworkers in 1980; the first legal strike by black mineworkers occurred in 1984, coinciding with a slump in gold prices. Low gold prices well into the new millennium, and increasing wages of unskilled labour due to more effective union representation led to shareholder pressure on companies to cut costs, eventually leading to a 60% reduction of the work force (Segal and Malherbe, 2000).

The isolation of South Africa during the apartheid era forced the mining houses to become increasingly horizontally integrated and diversified to make

up for the lack of imports and exports, which reduced their efficiency. After the end of apartheid the resulting industrial conglomerates were broken up and the constituent parts concentrated on their respective core businesses and were re-integrated into the global economy. The forced self-sufficiency, however, also led to the development of a strong support industry to the mining industry, which now is an export advantage.

Taxation of the mining industry in general was favourable, resulting in relatively little public revenue being generated. This in turn limited the public investment such as in infrastructure development and educational or social projects. Actual and perceived investment insecurity due to political uncertainty led to a significant capital outflow that peaked at 20% of Gross Domestic Product (GDP) in 2007.

5.2 Human geography

5.2.1 Demographics

In July 2015 the South African population reached 55 million, which comprise a 1.65% increase over 2014 (Stats SA, 2015a). In 1950 the population was only 13.7 million. However, the birth rate reduced from 25 per 1000 in 2002 to 23 per 1000 in 2015, indicating a more effective birth control and social choice for fewer children. About 30% of the population is aged younger than 15 years and approximately 8.0% (4.42 million) is 60 years or older. Life expectancy at birth for 2015 is estimated at 60.6 years for males and 64.3 years for females. Females make up about 51% of the population. Population dynamics continue to be impacted by HIV/AIDS incidence, with around 11% of the total population being infected, while for adults aged 15–49 years the incidence is an estimated 17%. Around 30% of the deaths are HIV/AIDS related (Stats SA, 2015a).

5.2.2 Ethnic composition

Statistics South Africa asks people to describe themselves in the census in terms of four racial population groups, namely African, Coloured, Indian/Asian, and White. The data as of July 2015 are given in ***Table 2***. It should be noted that 'Coloured' in South African terminology means of mixed-race descent.

Table 2: Mid-year estimates by population group and sex for 2015.

Population group	Male		Female		Total	
	Number	% of total population	Number	% of total population	Number	% of total population
African	21,653,500	80.6	22,574,500	80.4	44,228,000	80.5
Coloured	2,334,800	8.7	2,498,100	8.9	4,832,900	8.8
Indian/ Asian	688,100	2.6	673,900	2.4	1,362,000	2.5
White	2,201,900	8.2	2,332,200	8.3	4,534,000	8.3
Total	26,878,300	100.0	28,078,700	100.0	54,956,900	100.0

Source: Stats SA, 2015a

The first census in South Africa in 1911 showed that Whites made up 22% of the population (Christopher, 2010); it declined to 16% in 1980, to 8.9% in 2011 and 8.3% in 2015.

5.2.3 Language

South Africa has eleven official languages: Afrikaans, English, Ndebele, Northern Sotho, Sotho, Swazi, Tswana, Tsonga, Venda, Xhosa and Zulu. In this regard it is third only to Bolivia and India in number. While all the languages are formally equal, some languages are spoken more than others. According to the 2011 census (Stats SA, 2012), the three most spoken first languages are Zulu (22.7%), Xhosa (16.0%), and Afrikaans (13.5%). Despite the fact that English is recognised as the language of commerce and science, it ranked fourth, and was spoken by only 9.6% of South Africans as a first language

in 2011 (***Table 3***).

The country also recognises several unofficial languages, including Fanagalo, Khoe, Lobedu, Nama, Northern Ndebele, Phuthi, San and South African Sign Language. These unofficial languages may be used in certain official uses in limited areas where it has been determined that these languages are prevalent. Nevertheless, their populations are not such that they require nationwide recognition. Many of the 'unofficial languages' of the San and Khoikhoi people contain regional dialects stretching northwards into Namibia, Botswana, and elsewhere. These people, who are a physically distinct population from other Africans, have their own cultural identity based on their hunter-gatherer societies. They have been marginalised to an extent, and many of their languages are in danger of becoming extinct.

Table 3: South Africa first languages.

First Language	Number of speakers	%	First Language	Number of speakers	%
Afrikaans	6,855,082	13.45	Setswana	4,067,248	7.98
English	4,892,623	9.60	Sign language	234,655	0.46
IsiNdebele	1,090,223	2.14	SiSwati	1,297,046	2.55
IsiXhosa	8,154,258	16.00	Tshivenda	1,209,388	2.37
IsiZulu	11,587,374	22.74	Xitsonga	2,277,148	4.47
Sepedi	4,618,576	9.06	Other	828,258	1.63
Sesotho	3,849,563	7.55	Setswana	4,067,248	7.98

Source: Stats SA, 2012

The country also recognises several unofficial languages, including Fanagalo, Khoe, Lobedu, Nama, Northern Ndebele, Phuthi, San and South African Sign Language. These unofficial languages may be used in certain official uses in limited areas where it has been determined that these languages are prevalent. Nevertheless, their populations are not such that they require nationwide recognition. Many of the 'unofficial languages' of the San and Khoikhoi people contain regional dialects stretching northwards into Namibia, Botswana, and elsewhere. These people, who are a physically distinct population from other Africans, have their own cultural identity based on their hunter-gatherer societies. They have been marginalised to an extent, and many of their languages are in danger of becoming extinct.

5.2.4 Religion

The 2014 household census (Stats SA, 2015b) shows that an estimated 86% of South Africans were affiliated to the Christian religion in South Africa, while 5.1% professed to follow ancestral, tribal, animist or other traditional religions. An estimated 2.2% of the population considered themselves Muslim while 5.5% did not follow any religion in particular. The latter figure was particularly high in Eastern Cape (15%). Only 0.2% of individuals were estimated to be Jewish. Individuals were most likely to be Christians in Northern Cape (98%), Free State (98%) and least likely to be so in Limpopo (77.8%) where 7.2% of individuals followed ancestral, tribal, animist or other traditional African religions and 15% professed following 'nothing in particular'. The highest concentrations of Muslims were found in Western Cape (7.4%) and KwaZulu-Natal (2.6%), while the highest percentage of Hindus was found in KwaZulu-Natal (3.9%).

African Indigenous Churches made up the largest of the Christian groups. Some believe that many people claiming no affiliation with any organised religion adhered to traditional indigenous religions. Many people follow syncretic religious practices combining Christian and indigenous influences. Muslims are largely found among the Coloured and Indian ethnic groups. They have been joined by black or white South African converts as well as immigrants from other parts of

Africa. South African Muslims claim that their faith is the fastest-growing religion of conversion in the country, with the number of black Muslims growing six fold, from 12,000 in 1991 to 74,700 in 2004. The Hindu population has its roots in the British colonial period, but later waves of immigration from India have also contributed to it. Most Hindus are of South Asian origin, but there are many who come from mixed racial stock. Some are converts due to the efforts of Hindu missionaries. Other minority religions in South Africa are Sikhism, Jainism and Bahá'í Faith (Stats SA, 2005).

5.2.5 Cultural Norms, Values & Conflicts

The South African society can be divided into three major groups with (under certain circumstances) rather different sets of cultural norms and values, namely blacks (made up of wide variety of indigenous ethnicities), whites (mainly of Dutch and British descent), and Asians (of mainly Indian and Pakistani origin). The white population largely shares the norms and values with the Western European populations from which they derive. In the second half of the 20th century the white population entered into conflict with much of the rest of the world by the introduction of the 'apartheid' policy that imposed strict racial segregation. This brought the white population also into conflict with the other population groups in South Africa. Some of the Blacks and many Asians began to embrace certain Western world cultural norms and values. Otherwise, one must assume that normative and value systems in the black and coloured populations show a significant heterogeneity, reflecting their diverse ethnic origin and cultural traditions. The 'traditional' norms and values, however, are on occasion at odds with the Western world norms and values of human rights and gender equality as now enshrined in the South African constitution.

The heterogeneity of the black population derives from their varied ethnic background. Historically, fighting between larger ethnic groups over predominance was as common as fighting between the advancing Europeans and the native population. It appears that ethnic background and membership to clans continue to be important factors in self-identification and today may still lead to conflict. Similarly, whites, although first identifying themselves as South Africans, retain a spiritual ancestral relationship: it is important whether they are of British or Dutch (Afrikaner) descent[1] .

The native African population originally pursued subsistence agriculture. With the advance of the Afrikaners many lost their land and subsequently many males became migrant labourers, initially on farms and later in mining and other industries. This affected the social structure, as there has been a division of labour between males and females. Families lacked for much of the time their 'head' and became dependent on the money sent back by the males. Family affairs were managed almost exclusively by the females. At the same time male-only communities around mines and industrial establishments arose, with all the social problems related to this.

With the end of Apartheid a shift in gender norms was also observed. Females (nominally) achieved equal rights. However, old social patterns appear to persist in all population groups. Female self-determination has also become an important aspect in limiting the spread of HIV and in reducing rates of unwanted pregnancy.

5.2.6 Civil society & environmental awareness

Historically, there have been two major inflection points in the South African society: a) the struggle between the agriculturally dominated 'Boer' settlers and the post-Vienna Congress influx of industrial/mineral raw materials oriented British, which culminated in the Anglo-Boer Wars of the early 20th century; and b) the struggle between the native African population and the European descent population that resulted in the so-called 'apartheid' segregation and culminated in its abolishment in the early 1990s. Much of civil society policies and efforts were directed until today towards a re-equilibration of political and economic power as well as the necessary catching up of the African population with respect to

1 www.everyculture.com/Sa-Th/South-Africa.html

education among other areas.

Under apartheid, civil society was generally defined by its relationship to the state – either serving white interests and aligned to the state, or in opposition to the state. Since 1994, civil society organisations (CSOs) had to renegotiate their relationship to the state. Many organisations have found that the government had not delivered on its promises and as a result have focused on serving poor communities, often without state assistance or interest. The National Development Agency[2] was established to develop a partnership between government and CSOs for service delivery and is intended to provide assistance to organisations working in service delivery and poverty alleviation. Through the National Development Agency Act (NDA Act of 1998), the NDA is "aimed at promoting an appropriate and sustainable partnership between the Government and civil society organisations to eradicate poverty and its causes." (Graham et al., 2008). Poverty alleviation, in particular through education, is one of the major pre-occupations of the government, as mentioned earlier (***Table 4***).

2 NDA, www.nda.org.za

Table 4: Key focus areas for Civil Society Organisations.

Focus area	*No. of CSOs*	*Focus area*	*No. of CSOs*
Education	*58*	*Disability*	*22*
Children	*54*	*Human Rights*	*15*
HIV/AIDS	*49*	*Agriculture*	*13*
Community Development	*38*	*Early Childhood Development*	*12*
Capacity Building	*33*	*Aged*	*10*
Capacity Development/Training	*33*	*Counselling & Therapy*	*10*
Gender	*33*	*Legal Services*	*10*
Health	*25*	*Poverty Relief*	*10*
Youth	*25*		

Source: Graham et al., 2008

Civil society formations during the apartheid era in South Africa were based on race, ethnicity and class and were largely involved in advocacy work – opposing the apartheid state. Some organised their struggle according to a range of issues such as working conditions, high rents, environmental degradation, urban services and agricultural productivity. During the struggle, these issues were deeply politicized. Most (although by no means all) anti-apartheid CSOs were dependent on the African National Congress[3] (ANC) for popular legitimacy and leadership in order to defeat the then government. When the ANC stepped into power, CSOs had to consider their independence from the state and their dependence on the ANC. While the post-apartheid government realised the need to rely on CSOs to aid it in its striving for poverty alleviation, it became increasingly apprehensive of the implicit power of CSOs. Developing effective partnerships therefore became important. This created a dilemma for the CSOs, which now have less ability to impact on policy. They have become dominated by the urban elite, who may partner with government, often around service-delivery, and as a result become less relevant to the disenfranchised. There are, however, some significant exceptions here.

In effect, the civil society sector is once again positioning itself as the voice of the people against the state, an essential role in ensuring accountability in a stable democracy (Graham et al., 2008). In the context of the EO-Miners project[4]

3 The African National Congress is the Republic of South Africa's governing social democratic political party. It has been the ruling party since the establishment of a non-racial democracy in April 1994, including the election of Nelson Mandela as president from 1994-1999.

4 The project EO-MINERS was funded by the Seventh Framework Program of the European Commission, to monitor mineral resources exploration and mining from concept to closure and observe, monitor and provide

also the presence, agendas, and activities (specifically in the area of mining) of CSOs organisations were reviewed (Falck et al., 2012), which is small compared to those addressing other issues. Overall, the South African society is still in the process of redefining its governance paradigms and structures.

The United Nations Earth Summit in Johannesburg in 2002 probably has made South Africans more aware of mining´s social and environmental impacts due to the publicity it received and the fact that it took place in the country. Fieldwork carried out in the Mpumalanga Province in the context of the EO-Miners project (Falck and Spangenberg, 2013; Wittmer et al., 2013) indicated a wide range of environmental concerns particularly related to mining. Social and environmental impacts were seen as closely related, particularly when mining is the root cause. However, the level of environmental awareness and pre-occupation beyond immediate well-being appears to depend largely on the socio-economic background of the group in question. Environmental concerns and moreover the ensuing actions are luxuries for those groups with higher incomes. These findings corroborate those by Anderson et al., (2010), which were based on the South African 2004 household census. Anderson et al., (2010) explored the relationships between perceptions, behaviours and awareness regarding four environmental conditions in South Africa: water pollution, land degradation, air pollution and littering.

First, the extent to which these perceptions, behaviours and levels of awareness correspond to those found in other parts of the world were assessed. Secondly, the importance of race, ethnicity and socioeconomic status in differences and similarities in environmental perceptions, behaviours and awareness were analysed. African households are much more likely to perceive environmental problems than non-African households, but non-African households are more likely to take action in response to environmental problems and to be aware of environmental initiatives. Logistic regression analyses reveal that the particular circumstances of households are important in response to environmental issues. For example, households with access to land for agriculture are more likely to perceive land degradation as a problem than are households without access to land for agriculture. Education of the household head is rarely important for perception of environmental problems, but education is usually important for whether the household takes action in response to an environmental problem and for awareness of environmental initiatives. The authors of the study also concluded that even an improvement of the socio-economic conditions of the African population segment will not necessarily change their environmental awareness over the short term. The study also suggests that environmental matters are not a high priority for the South African public. On the other hand, the EO-Miners project observed an awareness of mining and coal/steel related environmental issues, though the interviewees may not have been representative of the population as a whole.

With regards to the social licence for the mining industry, in the past, South Africa had strong government support for mining, but with mixed impact. Mining provided income for rural people, but migrant labour has led to social problems such as health and environmental issues. Post-1994, there has been a rise in environmental activism and social demands, strikes and disputes increased (e.g. Marikana massacre). In the future, this will most likely increase.

5.3 Education

5.3.1 Education system

Since 1994 the South African education landscape has undergone major transformation in governance, management, curricular reform, and teacher professional development. Central to this transformation has been a complete policy overhaul in the form of a new national qualifications framework (NQF) and a new curriculum framework for schools based on the concept of outcomes-based education (OBE). The NQF is a key mechanism for creating an egalitarian

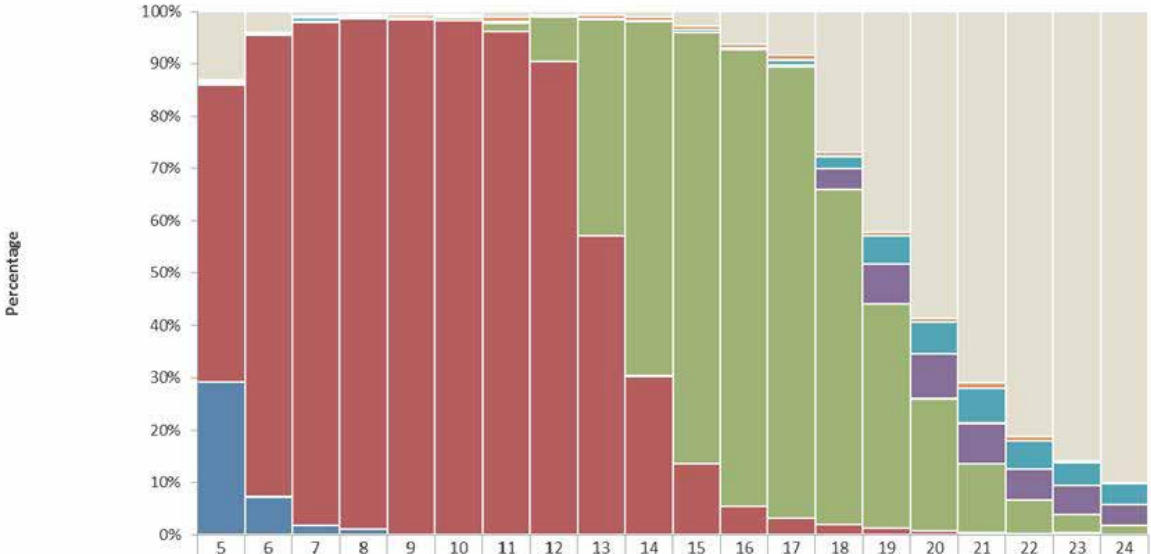
information to manage its impacts on the environment and society. See http://www.eo-miners.eu/

education and training system in South Africa with redress, access, mobility, and progression as key objectives. OBE, on the other hand, is a learner centred approach that considers learning as an interactive process between educators and learners, where the educator serves as both teacher and facilitator. This new system, introduced in 1996 as Curriculum 2005, was considered one of the most ambitious and far-reaching reform programmes in southern Africa because it signalled a shift from South Africa's apartheid past by promoting the principles of equity, democracy, human rights, and economic prosperity. However, recently, OBE has been abandoned and a new curriculum (Schooling 2025) has been introduced.

South Africa established a single national system of education that is managed by the National Department of Education (NDOE) with the support of nine Provincial Departments of Education (PDOE). The NDOE assumes national responsibility for higher education, while administrative responsibility for the schools sector lies with the PDOEs based on the national framework for school policy. A Council of Education Ministers, consisting of the Minister of Education, the Deputy Minister of Education, and the nine provincial members of the Executive Council for Education, meets regularly to discuss national education policy, and co-ordinate action. In addition a Heads of Education Departments Committee (HEDCom) consists of the Director-General, Deputy Directors-General of the NDOE, and the heads of PDOEs. The 2014 Household Census (Stats SA, 2015b) shows some progress in educational achievement as well as literacy over the preceding 20 years. More than 95% of the age group 6 to 15 are enrolled for some form of education (***Figure 5***). After this age the percentages begin to decline.

South Africa had around 14 million learners in 2014 in schools and universities (Stats SA, 2015b). In 2014, there were around 13 million learners in ordinary public and independent schools in South Africa, who attended around 26,000 schools and were served by 430,000 educators (DBE, 2015). Of all schools, approximately 6,000 are high schools (Grade 7 to 12) and the rest primary (Grades 0 to 6). As to tertiary education, the 2014 census

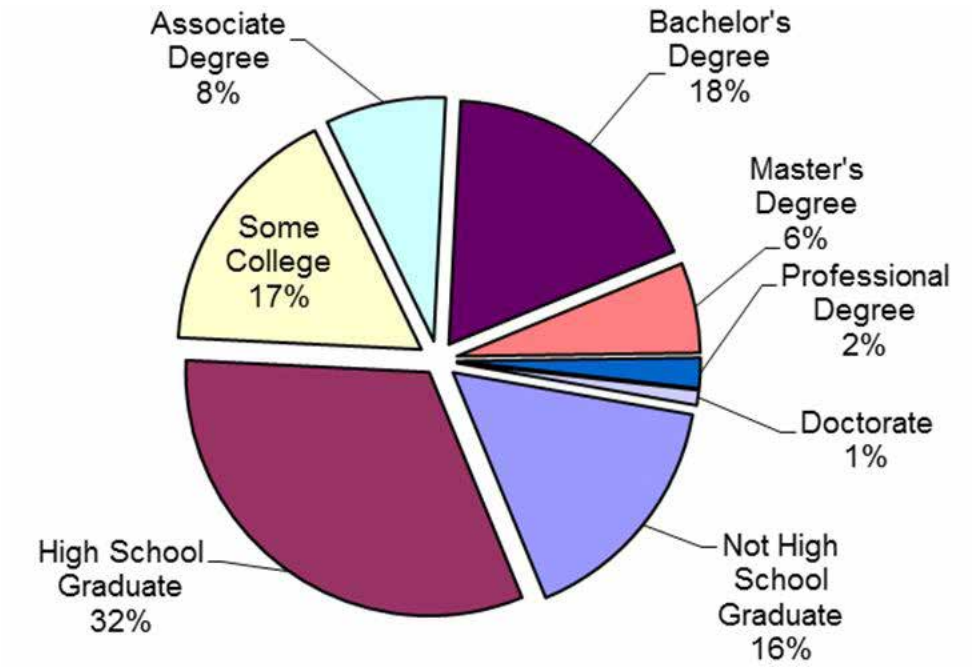
Figure 5: Type of educational institution attended by 5–24 year olds in 2014.



	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Not in education	13,2	4,2	1,0	0,5	0,8	0,5	1,0	0,8	0,7	1,1	2,9	6,4	8,5	27,1	42,1	58,7	71,0	81,2	85,9	90,0
Other	0,3	0,2	0,4	0,4	0,5	0,5	0,9	0,2	0,8	0,7	0,7	0,7	0,9	0,7	0,7	0,8	1,0	1,0	0,5	0,3
FET and other colleges	0,3	0,1	0,6	0,2	0,2	0,3	0,5	0,2	0,1	0,1	0,5	0,3	0,8	2,3	5,4	6,0	6,7	5,4	4,2	3,9
University	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,1	0,5	3,9	7,7	8,6	7,6	5,6	5,7	4,0
Secondary school	0,2	0,1	0,2	0,4	0,2	0,6	1,5	8,5	41,2	67,9	82,3	87,1	86,3	63,9	42,9	25,3	13,3	6,6	3,4	1,8
Primary school	56,9	88,3	95,9	97,3	98,3	98,1	96,1	90,4	57,2	30,2	13,5	5,5	3,0	2,1	1,2	0,7	0,3	0,2	0,3	0,1
Pre-school	29,2	7,2	1,9	1,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Source: Stats SA, 2015b

Figure 7: Highest Level of Education Attained by Persons 25 Years and Older.



Source: U.S. Department of Education and NCES (2003)

(Stats SA, 2015b) estimates that 780,000 students were enrolled at higher education institutions (universities and universities of technology). Almost two-thirds (63%) of these students were black African, while 25% were white; 5.9% each coloured and Indian/Asian. These numbers indicate that the white and Indian/Asian communities are overrepresented by a factor of two compared to their percentage in the population (cf. ***Table 2***). In general, gender parity in education attendance was found, but women are more likely to drop out of education earlier for social and economic reasons, such as marriage and pregnancy. The 2014 census also showed that the number of people with no formal education has approximately halved since 2002. As can be expected, the lowest literacy levels are found in the age group 60+, where women are more likely to be illiterate than men. However, literacy levels averaged 93% for the whole country, with the lowest level (88%) found in the Limpopo Province.

While enrolment levels and formal achievement levels have increased in recent years, the actual quality of education remains low for large parts of the predominantly black population. Inadequate school infrastructure and teachers are cited as reasons (Murtin, 2013).

5.3.2 Education infrastructure

5.3.2.1 Basic education

In 2014 there were 26,000 schools in South Africa[5]. However, the quality and physical infrastructure of schools is highly variable across the country. Such inequality is due to apartheid era legacies and the need to rapidly expand the schooling system over the past 20 years. There are considerable differences between urban and rural areas, but the main differences remain between previously white schools and those in black, coloured and Indian communities. Many of the inequalities created during apartheid remain today – nineteen years into the new democracy. In November 2013 legally binding Norms and Standards for School Infrastructure were established that determine that every school must have water, electricity, internet, working toilets, safe classrooms with a maximum of 40 learners, security, and thereafter libraries, laboratories and sports facilities. The Norms and Standards regulations apply to all public schools in South Africa[6]. Thousands of schools in South Africa lack the infrastructure neces-

5 www.education.gov.za/LinkClick.aspx?fileticket=ci%2f3HwFhNrg%3d&tabid=462&mid=1326&forcedownload=true, accessed 03.08.15

6 www.equaleducation.org.za/page/school-infrastructure

sary in order to provide learners with the quality education which they are legally entitled to receive. The Department of Basic Education's (DBE[7]) National Education Infrastructure Management System (NEIMS) Report (DBE, 2011), notes that, of the 25,000 public ordinary schools:

- 3500 schools do not have electricity, while a further 800 schools have an unreliable electricity source;
- 2400 schools have no water supply, while a further 2600 schools have an unreliable water supply;
- 913 do not have any ablution facilities while 11,000 schools are still using pit latrine toilets;
- 23,000 schools do not have stocked libraries, while 20,000 do not even have a space for a library;
- 21,000 schools do not have any laboratory facilities, while 1200 schools have stocked laboratories;
- 2700 schools have no fencing at all; and 19,000 schools do not have a computer centre; whilst a further 3200 have a room designed as a computer centre but are not stocked with computers.

There are also currently over 400 schools in the Eastern Cape that are classified as 'mud-schools', many of them consisting of mud and metal shacks.

5.3.2.2 Higher education

In 2004 South Africa started reforming its higher education system, merging and incorporating small universities into larger institutions, and renaming all higher education institutions as 'universities'. There are currently 11 institutions with 'traditional' university status, of which three attained this status in 2004 or 2005. This list is complemented by eight 'universities of technology, most of which were set-up over the past ten years to provide a vocational curriculum and six 'comprehensive' universities which provide a combination of theoretical and vocational education and training. The education institutions which provide education in the field of mining include: the University of the Witwatersrand (Johannesburg), the University of Johannesburg, the University of Pretoria, the University of the Free State, the University of South Africa and the Chamber of Mines of South Africa. The University of the Witwatersrand, University of Pretoria, University of Johannesburg, and University of South Africa have historically produced mining graduates for the South African mining industry with any shortfall being met by the recruitment of overseas graduates. More recently, the global shortage of engineers and other mining industry professionals has seen a reversal of this trend and a very significant emigration of well-educated and highly skilled personnel. At both the University of the Witwatersrand and the University of Pretoria, student numbers show an increasing trend in the past five years. The expectation is that there will be over 100 mining graduates (over 65 at the University of Witwatersrand and over 35 at University of Pretoria) being produced in 2012, increasing to a total of about 150 graduates in 2014 (Musingwini et al., 2013). However, the global skills shortage and demand are an important driver of emigration and brain drain of mining engineers to other countries.

There are also a large number of other educational institutions in South Africa - some are local campuses of foreign universities, some conduct classes for students who write their exams at the distance-education University of South Africa (UNISA) and some offer unaccredited or non-accredited diplomas. Universities and colleges are accredited by the Council on Higher Education. Higher education is facing increasing costs, which in turn affects its accessibility. Rising costs are attributed to higher education institutions raising their fees on the back of rising maintenance costs, more expensive municipal services, and higher enrolment rates. The rand-dollar exchange rate has also increased the cost of imported books and materials. The financial status of higher education institutions shows that total expenses increased by 12% in 2013 compared to 2012, rising from R41,4 billion to R46,2 billion. This rise in spending by higher education institutions was mainly driven by increases in the purchases of goods and services (up by 13%) and compensation of employees (up by 10%). Compensation of employees contribu-

7 www.education.gov.za

ted 55% to higher education spending in 2013, followed by purchases of goods and services at 39% (Stats SA, 2014a).

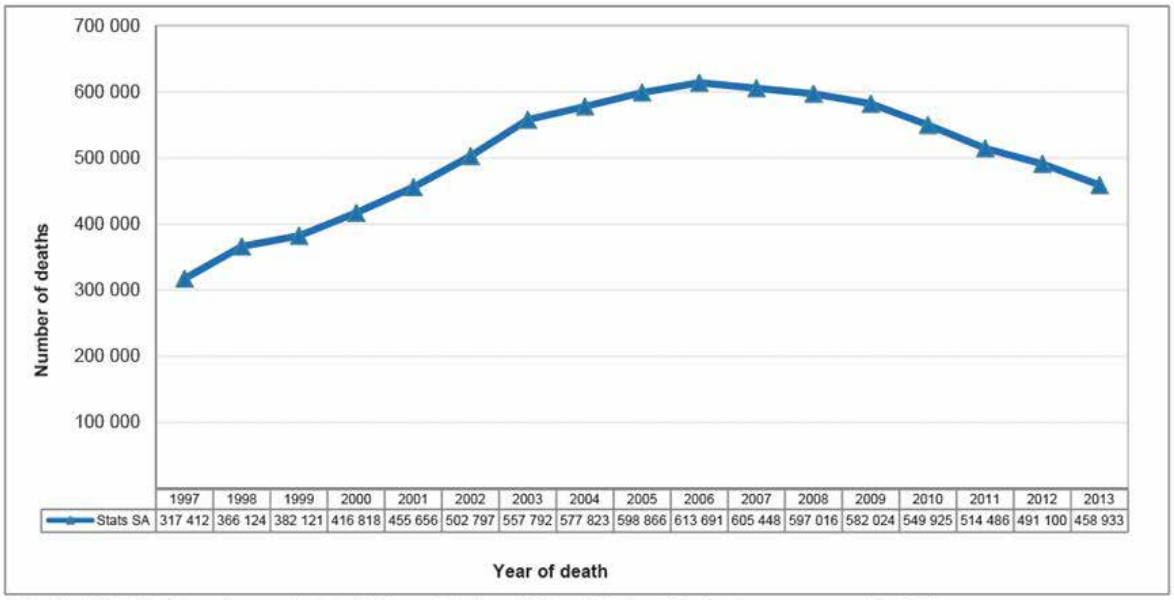
5.4 Health

5.4.1 Health system

Although restructuring of the public health sector post-1994 achieved substantial improvements in terms of access, rationalisation of health management and more equitable health expenditure, fifteen years later these early gains have been eroded by a greatly increased burden of disease related to HIV/AIDS, generally weak health systems management and low staff morale.

The result is poor health outcomes relative to total health expenditure. One of the first tasks of the new Government in 1994 was to establish a comprehensive system of vital registration. Since 1996, the completeness of death registrations has improved from about 67% to 82%. This variation makes it difficult to gauge changes in mortality with accuracy, but there is no doubt that the real number of deaths in South Africa has increased sharply between 1997 and 2006 (***Figure 6,*** Stats SA, 2014b).

Figure 6: Number of registered deaths 1997–2013.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Stats SA	317 412	366 124	382 121	416 818	455 656	502 797	557 792	577 823	598 866	613 691	605 448	597 016	582 024	549 925	514 486	491 100	458 933

*Data for 1997–2012 have been updated with late registrations / delayed death notification forms processed in 2014.

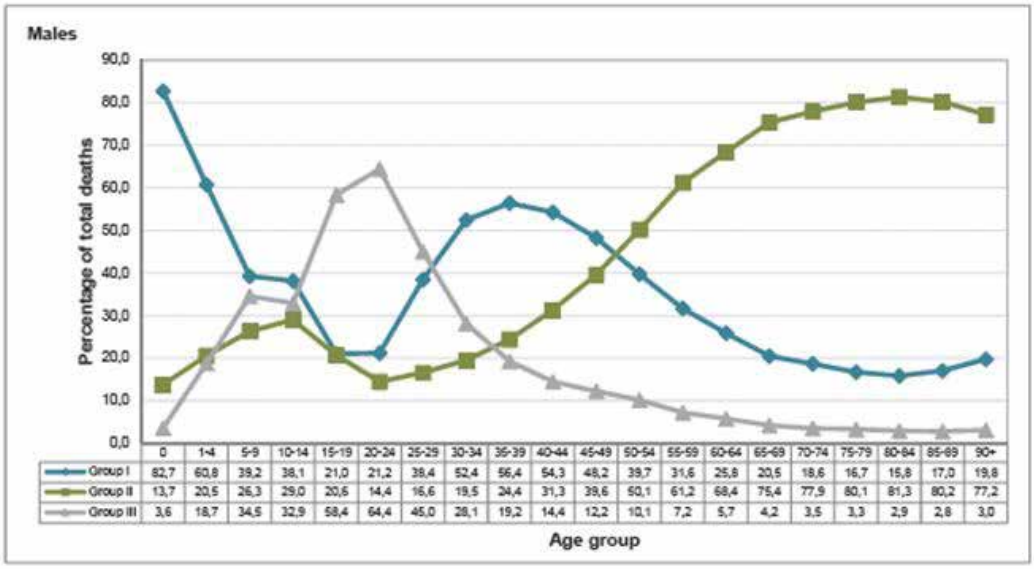
Source: Stats SA, 2014b

In the early 2000s the major causes of death were HIV/AIDS, followed by cardiovascular diseases, cancers and violence (Figure 8). However, this picture has changed and nowadays (2014), tuberculosis is the leading cause of death among South Africans, with HIV/AIDS being the third leading cause of death. The increased number of deaths among infants and young children has reversed the declines in mortality that had occurred from about 1980. The infant mortality rate increased from roughly 50 per 1,000 live births in 1994 to about 60 in 2003. With the expansion of prevention of mother-to-child transmission, it has now reverted to 1994 levels. Child mortality has probably also peaked and should decline further with increasing availability of anti-retroviral treatments.

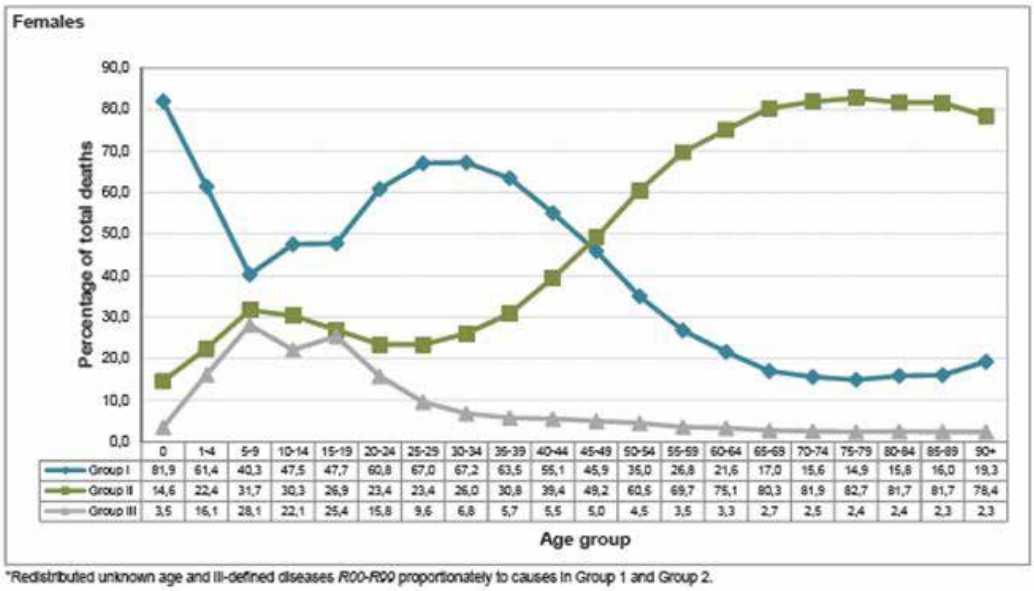
5.4.2 Health infrastructure

Health care spending in South Africa amounts to 8.8% of GDP in 2014, somewhat below the OECD average of 9.3%. In 2012, South Africa had only 0.7 physicians per 1000 population, well below the OECD average of 3.2. There were also only 1.1 nurses per 1000 population in South Africa in 2012, compared with an OECD average of 8.8. About 70% only of children in South Africa were vaccinated against diphtheria, tetanus and pertussis (DTP) and measles in 2012, which

Figure 7: Percentage distribution of deaths due to communicable diseases (Group I), non-communicable diseases (Group II) and injuries (Group III) by sex and age group, 2013.



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Group I	82,7	60,8	39,2	38,1	21,0	21,2	38,4	52,4	56,4	54,3	48,2	39,7	31,6	25,8	20,5	18,6	16,7	15,8	17,0	19,8
Group II	13,7	20,5	26,3	29,0	20,6	14,4	16,6	19,5	24,4	31,3	39,6	50,1	61,2	68,4	75,4	77,9	80,1	81,3	80,2	77,2
Group III	3,6	18,7	34,5	32,9	58,4	64,4	45,0	28,1	19,2	14,4	12,2	10,1	7,2	5,7	4,2	3,5	3,3	2,9	2,8	3,0



	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
Group I	81,9	61,4	40,3	47,5	47,7	60,8	67,0	67,2	63,5	55,1	45,9	35,0	26,8	21,6	17,0	15,6	14,9	15,8	16,0	19,3
Group II	14,6	22,4	31,7	30,3	26,9	23,4	23,4	26,0	30,8	39,4	49,2	60,5	69,7	75,1	80,3	81,9	82,7	81,7	81,7	78,4
Group III	3,5	16,1	28,1	22,1	25,4	15,8	9,6	6,8	5,7	5,5	5,0	4,5	3,5	3,3	2,7	2,5	2,4	2,4	2,3	2,3

*Redistributed unknown age and ill-defined diseases R00-R99 proportionately to causes in Group 1 and Group 2.

Source: Stats SA, 2014b

is less than the coverage in most OECD countries which is close to 100%[8].

The public sector is the main source of health funding in nearly all OECD countries. In South Africa, 48% of health spending was funded by public sources in 2012, much lower than the average of 72% in OECD countries. The tax funded public health system covers 85% of the population and a well-entrenched private health system covers the rest. The bulk of private funding comes from medical aid contributions (66%) and out-of-pocket payments (23%).

The public health system is led by the National Department of Health[9], which is responsible for overall health policy and co-ordination. It derives its mandates from the Constitution[10] as well as the National Health Act No. 61 of 2003[11]. The Ministry of Defence provides services to the armed forces and the Ministry of Correctional Services to prisoners.

Implementation and delivery of health services is through the 9 provinces (states) and 284 municipalities (local government authorities). The provinces provide mainly

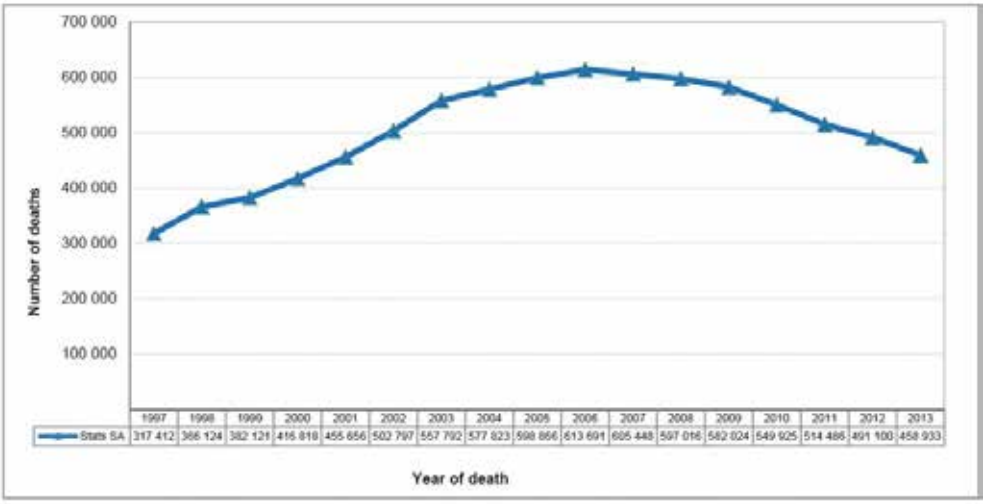
8 www.oecd.org/els/health-systems/Briefing-Note-SOUTH-AFRICA-2014.pdf, accessed 24.08.15

9 http://www.health.gov.za

10 www.constitutionalcourt.org.za/site/theconstitution/thecertificationprocess.htm

11 www.hst.org.za/sites/default/files/a61-03.pdf

Figure 8: Causes of death in South Africa, 2000.



Source: Bradshaw et al., 2003.

(curative) hospital services with local / municipal government providing primary health care and non-personal (environmental) health services. According to the latest available annual report of the Department of Health (DoH, 2012) further progress was made in recent years towards the implementation of the three streams of a re-engineered Primary Health Care (PHC) model, through creation and deployment of municipal ward-based PHC outreach teams in defined geographic areas (wards); deployment of district clinical specialist teams in all districts across the country and strengthening of school health services.

The public health budget accounts for nearly 13% of the overall budget of government (cf. ***Table 10***). Since fiscal decentralisation (to the provinces) there is great variation between provinces on the actual budget allocations for health. There continues to be significant inter-provincial inequalities even though the variation in per capita spending between provinces has reduced. Within each province there is also large intra-provincial inequity, with the rural areas continuing to bear the brunt of poverty and inadequate resource allocation. In the Eastern Cape, for example, some districts are 166% above the equity target whilst others are below by 77%.

At a macro level, interventions in housing, sanitation, water supply and food security have played a major role in improving the health status. The high incidence of HIV/AIDS of 13% of the population continues to be a challenge to the health system that had been ignored for many years. Two consecutive strategic plans have been developed from 2007 onwards[12] covering the years up to 2016.

12 www.sahivsoc.org/upload/documents/National_Strategic_Plan_2012.pdf

6. Economic factors

6.1 Economic Geography

6.1.1 Economic structure

South Africa is one of the BRICS countries (Brazil, the Russian Federation, India, China and South Africa). The CIA World Fact book (CIA, 2015) summarises the country thus:

"South Africa is a middle-income, emerging market with an abundant supply of natural resources; well-developed financial, legal, communications, energy, and transport sectors, and a stock exchange that is Africa's largest and among the top 20 in the world. Even though the country's modern infrastructure supports a relatively efficient distribution of goods to major urban centres throughout the region, unstable electricity supplies retard growth. Economic growth has decelerated in recent years, slowing to just 1.5% in 2014. Unemployment, poverty, and inequality - among the highest in the world - remain a challenge. Official unemployment is roughly 25% of the work force, and runs significantly higher among black youth. Eskom, the state-run power company, is building three new power stations and is installing new power demand management programs to improve power grid reliability. Load shedding and resulting rolling black-outs gripped many parts of South Africa in late 2014 and early 2015 because of electricity supply constraints that resulted from technical problems at some generation units, unavoidable planned maintenance, and an accident at a power station in Mpumalanga province. The rolling black-outs were the worst the country faced since 2008. Construction delays at two additional plants, however, mean South Africa will continue to operate on a razor thin margin; economists judge that growth cannot exceed 3% until electrical supply problems are resolved. South Africa's economic policy has focused on controlling inflation, however, the country faces structural constraints that also limit economic growth, such as skills shortages, declining global competitiveness and frequent work stoppages due to strike action. The current government faces growing pressure from urban constituencies to improve the delivery of basic services to low-income areas and to increase job growth."

South Africa has an open economy, with trade activity making up a significant component of domestic economic activity. Exports and imports account for 29% and 30% of GDP respectively. Exports are dominated by minerals, but there has also been an increase in manufacturing exports in recent years. There has been much debate focused on recent losses in exports as a result of more intense competition from the east and the impact of high labour costs in South Africa. South African imports, on the other hand, consist mainly of capital and intermediate goods. Tariff liberalisation undertaken since the early 1990s has been a major contributor to South Africa's strong economic growth. A brief description of the country´s economy (current and historic evolution) between primary, secondary and tertiary industries is provided by Vickers, (2014).

6.1.2 Industrial Geography

The high value of mining exports reflects the industry's long history, local ownership and extensive backward integration into the wider South African economy. In 2012, mining contributed with ZAR 470 billion to South Africa's economy. The impact of the mining industry on other sectors (steel, timber and rail, for example) is close to 19% of South Africa's GDP. Additionally, mining accounts for over 16% of formal sector employment. Recent cost figures from the mining industry indicate that of the ZAR 440 billion spent in 2011, purchases and operating costs for steel, timber, electricity, rail, etc. accounted for the largest proportion of total expenditure, followed by wages at ZAR 89 billion and capital expenditure at ZAR 47 billion Kumo et al., (2014).

The finance from mining circulates throughout the economy, affecting sec-

tors as diverse as financial services and housing. The mining services and equipment sectors have developed into important exporters in their own right. Indeed, South African suppliers are global leaders in numerous areas, particularly the provision of washing spirals, underground locomotives, submersible pumps, hydropower equipment and mining fans. South African firms are also leaders in some of the vast mining support services, including geological services, prospecting, shaft sinking, turn-key solutions to the mining and mineral processing industries. They are also competitive on a global scale when it comes to the four vital areas of mine safety, tracked mining, shaft sinking and ventilation. Development in these areas is strong and considered much greater than in comparable countries such as Chile or Australia. According to the South African Capital Equipment Export Council (SACEEC[1]), one of South Africa's largest exports is mining equipment, accounting for 8.5% of total exports from 2005-2009, and 55% of capital equipment exports during the same period. It is estimated that 90% of the exports of the mining equipment and specialist services are local. Mining houses are clustered around Johannesburg and the supply industries around East Rand. Mining equipment and specialist services have not received any direct government subsidy at any stage in their development (Kumo et al., 2014).

South Africa's finance and retail industries also have deep value chains, and have an expanding presence in other African countries. The four major banks are well established, offering a full range of banking services and are amongst the top banking stakeholders on the continent. South African retailers are similarly branching out into neighbouring countries leading the "supermarketisation" of retail there. These regional value chains offer opportunity to create value in key industries, boost employment opportunities, and improve economic growth.

6.1.3 Commercial Geography

With respect to ease with which business can be conducted the country ranked 43rd out of 189 countries (World Bank, 2015). In Africa, only Mauritius ranked higher. However, South Africa remains one of the most difficult countries in the region for conducting cross-border trade (ranking 100th out of 189), but ranks 19th in terms of ease of paying taxes with a burden of 200 hours and 7 tax payments. The same report states that South Africa ranks 17th globally and 1st in the Southern African region in terms of protecting minority investors. According to the joint OECD-World Trade Organization (WTO) Trade in Value Added database (Kumo et al., 2014), South Africa ranks 2nd amongst the BRICS countries in terms of the average content of foreign value added to exports. China's exports contain 32% of foreign value added, whilst South Africa's contain 19%, ahead of those coming from Brazil, India and Russia with 15% or below. The amounts per sector (***Table 5***) reflect the strong resource base of mining and the import of components for e.g. the fabrication of road vehicles etc.

South Africa concluded comprehensive free trade agreements with the EU and the Southern Africa Development Community (SADC). These came into effect in 2000. The SADC integration milestone of a customs union by 2010 was moved to 2013, but as of 2015 has not been achieved[2]. In consequence the milestone of a

1 www.saceec.com

2 www.sadc.int/about-sadc/integration-milestones/

Table 5: Foreign added value requirements per industry.

Sector	*Percentage*
Mining	*12.16*
Agriculture and fisheries	*18.17*
Manufacture (average)	*28.41*
Transport equipment	*28.41*

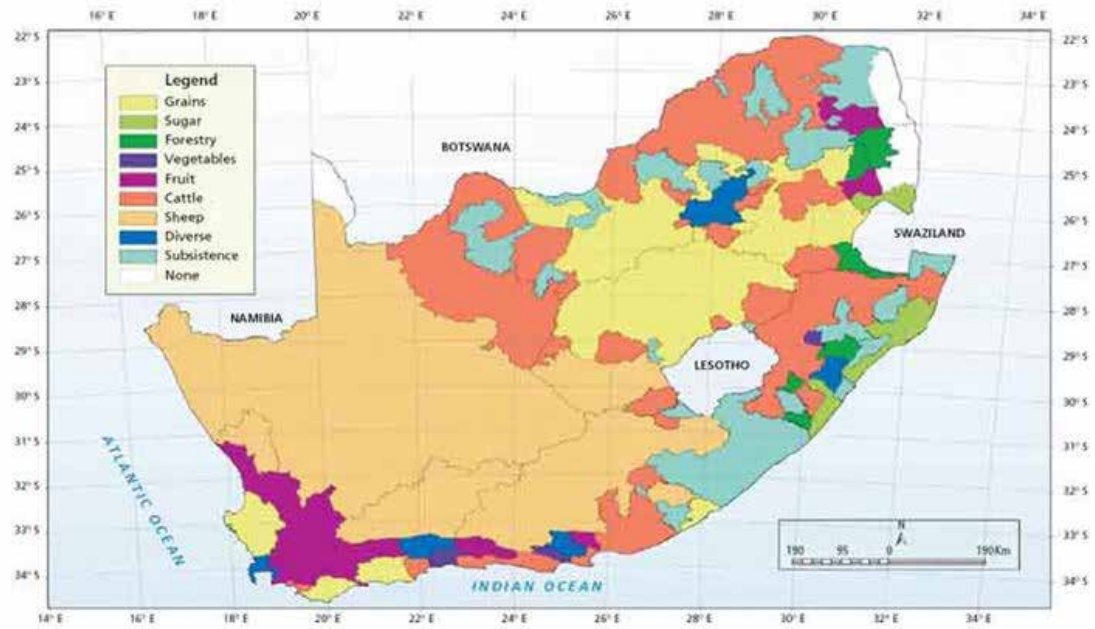
Source: http://stats.oecd.org

monetary union in 2016 seems even farther away.

6.1.4 Agricultural Geography

Climate-soil combinations leave only 12% of the country suitable for the production of rain-fed crops. With only 3% considered truly fertile land, South Africa has significantly less than countries such as India, where arable land covers 53% of the country. Most of South Africa's land surface (69%) is suitable for grazing, and livestock farming is by far the largest agricultural sector in the country in terms of area covered (***Figure 9***). Further, ranching or game farming in various forms is a significantly increasing area of activity, not reflected in ***Figure 9***.

Figure 9: Agricultural regions in South Africa



Source: FAO, www.fao.org/docrep/008/y5998e/y5998e05.jpg, accessed 31.07.15

Declining farming profitability and water scarcity (drought, declining rainfall or over-demand for water) has left South Africa with less than two-thirds of the number of farms it had in the early 1990s. In many instances the lost farms have changed to other land uses, or consolidated into larger farming units to achieve economies of scale. Although the area under maize, wheat and dairy (5% of the national herd) has decreased significantly over the last 20 years, production remains relatively constant, indicating an increasing trend in intensified production (WWF, 2010). The remaining farms have generally increased their irrigation, fuel, fertiliser, mechanisation and genetically modified seed inputs. In many cases, advisory services provided by fertiliser companies and agribusinesses have entered the vacuum of the under resourced government extension service. These corporate companies provide their own extension staff and build relationships with farmers, which can create a dependence on the products they promote and sell. Poorly managed intensive farming can have negative impacts on the natural environment and on a farmer's ability to adapt to change. An overuse of synthetic fertilisers, pesticides and herbicides reduces long-term soil fertility, causes soil erosion, pollutes water supplies and exposes farmers to fluctuations of oil-prices (WWF, 2010). Meat and dairy products are the main output of agriculture (***Table 6***), although other agricultural activities such as niche agriculture (organic and horticultural) and wildlife production are on the rise, and may have significant opportunity.

Table 6: Income and expenditure at current prices in ZAR'000.

Item	2012	2013 (est.)
Total income	164,363,379	182,979,543
Field crops	31,355,576	37,147,591
Horticultural products	32,097,987	37,693,442
Animals and animal products	82,794,336	87,291,165
Other income	18,115,480	20,847,345
Current expenditure	160,823,597	178,473,775
Salaries, cash wages and bonuses	19,013,984	20,719,604
Animals and additional products purchased	24,793,208	27,606,965
Other current expenditure	117,016,405	130,147,206
Capital expenditure	15,027,751	17,933,777

Source: Stats SA, 2014c

6.2 Economic Key Figures

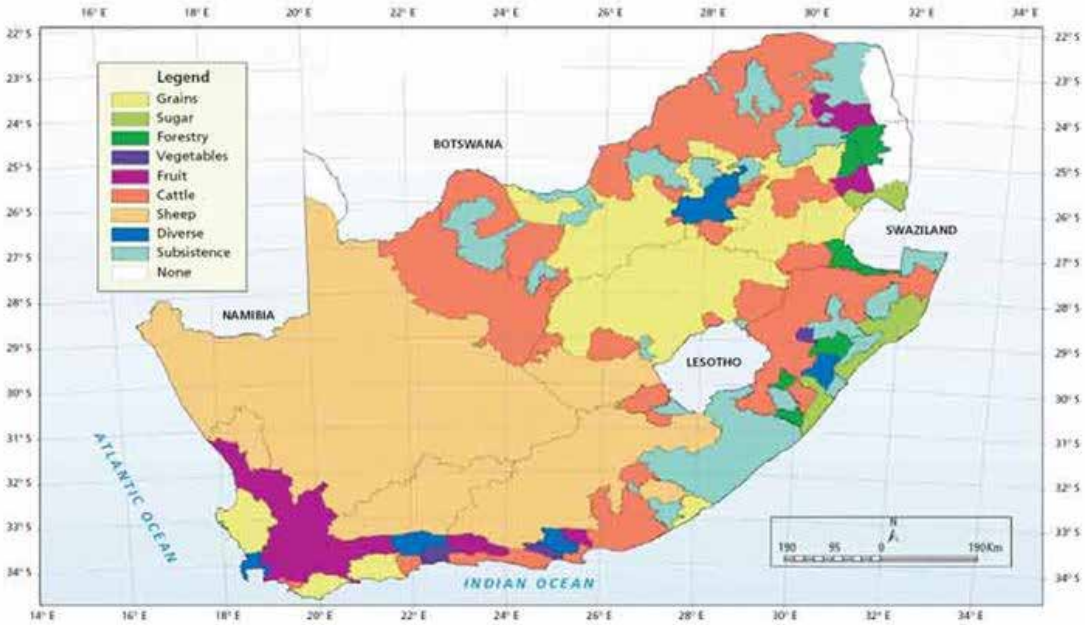
6.2.1 Economic diversity

Figure 10 gives an overview of the percentage value added by different economic sectors. As mentioned previously, the diverse structure of the South African economy is a critical aspect of its historical and current growth. The manufacturing sector continues to occupy a significant share of the South Africa economy, despite its relative importance declining from 19% in 1993 to about 17% in 2012 in real terms. In line with structural changes in many economies, it is not surprising to observe that the finance, real estate and business services sector increased its relative importance of 17% in 1993 to approximately 24% in 2012. These two sectors, amongst others, comprise an important component of South Africa's development trajectory.

6.2.2 Economic output

South Africa´s GDP in 2014 was US$680 billion (see ***Table 7***). As mentioned previously, South Africa's growth slowed from 3.5% in 2011 to 2.5% in 2012 and further to 1.5% in 2014, reflecting primarily the external economic environment, domestic la-

Figure 10: Percentage value added by different economic sectors in 2014.



Source: Stats SA, 2015c

bour conflicts and yet unresolved serious electricity supply problems. Growth declined in eight of the ten major subsectors (all but agriculture and construction).

Table 7: Key economic figures.

Variable	2012 estimate	2013 estimate	2014 estimate
GDP - purchasing power parity	$661.2 billion	$673.7 billion	$683.1 billion
GDP - real growth rate	2.5%	2%	1.5%
Industrial production growth rate	nd	nd	2%
GDP - per capita (PPP)	$12,600	$12,700	$12,700
Gross national saving	14.2% of GDP	13.5% of GDP	13.6% of GDP
Labour force	nd	nd	20.23 million
Unemployment rate	nd	24.7%	25%
Population below poverty line	35.9%	nd	nd
Budget - revenues	nd	nd	$87.1 billion
- expenditures	nd	nd	$102.2 billion
Taxes and other revenues	nd	nd	25.5% of GDP
Public debt	nd	46.1% of GDP	47.3% of GDP
Inflation rate (consumer prices)	nd	5.7%	6.1%
Central bank discount rate	7% (31.12.09)	nd	5.75% (31.12.14)
Commercial bank prime lending rate:	nd	8.5% (31.12.13)	9.25% (31.12.14)
Exports		$95.15 billion	$97.9 billion
Imports		$102.8 billion	$102.2 billion

Source: CIA, 2015; nd = no data available

Export commodities are mainly gold, diamonds, iron and coal, platinum, other metals and minerals, machinery and equipment; these goods are mainly sent to China (32%), the USA (6.5%), Japan (5%), and India (4.7%). Import commodities include machinery and equipment, chemicals, petroleum products, scientific instruments and foodstuffs. South Africa's main import trade partners are China (16.2%), Germany (9.5%), Saudi Arabia (8%), the USA (7%), and India (4.8%). While imports and exports are balanced for the USA and India, one notes a significant export surplus with China and import surpluses with Germany and Saudi Arabia. The latter is presumably due to petroleum products. UNCTAD (2013) classifies South African exports as 55% resource based, 5% low-tech manufacturing, 25% mid-level manufacturing, and 5% knowledge-based services. South Africa further generates large flows of foreign direct investment from its mining, wholesale, and health-care products sectors.

6.2.3 Labour costs, mobility & employment

Employment statistics continue to indicate high unemployment rates in the order of 25% on average. Such statistics are even higher for young people, where it reaches 70% for the 15-24 yr age group. This unemployment rate does not, however, include the so-called "not economically active" (NEA) population. The NEA population is divided into discouraged job-seekers and other (not economically active population). The discouraged are a subset of the not economically active who are persons who wanted to work and were available to work but did not try to find a job or start a business in the reference period due to the following three reasons: no jobs available in the area; unable to find jobs requiring their skills; or lost hope of finding any kind of job, while reasons for other NEA include engagement in educational activity (around 17%) and home duties among others (Stats SA, 2015d). ***Table 8*** gives a breakdown of em-

ployment into different sectors of activity. The high share of publically employed and household employees is worth noting. Nearly 1 in 12 employed works in a private household. The level of informal employment with a 1:5 ratio compared to formal employment is rather high.

The distribution of skilled, semi-skilled and unskilled labour among the different population groups and genders (***Figure 11***) is

Table 8: Key labour market indicators.

	I/2014	IV/2014	I/2015
	Thousands		
Population aged 15–64 yrs	35177	35643	35799
Labour force	20122	20228	20994
Employed	15055	15320	15459
- Formal sector (non-agricultural)	10780	10911	10796
- Informal sector (non-agricultural)	2336	2448	2483
Community and social services	3428	3501	3450
Trade	3186	3247	3046
Finance and other business services	2045	2039	2195
Manufacturing	1804	1749	1779
Construction	1199	1334	1322
Transport	895	952	899
Agriculture	709	742	891
Mining	424	427	443
Utilities	130	104	143
Private households	1231	1219	1288
Unemployed	5067	4909	5535
Not economically active	15055	15415	14805
Discouraged job-seekers	2355	2403	2397
Other (not economically active)	12700	13012	12408
Rates	%		
Unemployment rate	25.2	24.3	26.4
Employment/population ratio (absorption rate)	42.8	43.0	43.2
Labour force participation rate	57.2	56.8	58.6

Source: Stats SA, 2015d

a reflection of the social patterns in South Africa's society. Jobs requiring certain skills are most likely occupied by whites or Indians/Asians. Also worth noting is the higher level of skilled black women compared to men. Unemployment rates vary considerably from Province to Province, reflecting the predominant economic activities in the region. The recruitment of unskilled labour from neighbouring states seems to remain an important aspect of the labour market in the mining industry (Segal and Malherbe, 2000).

The annual increase of unit labour cost has slowed to 0.6%. More frequent and longer strikes in recent years have increased costs.

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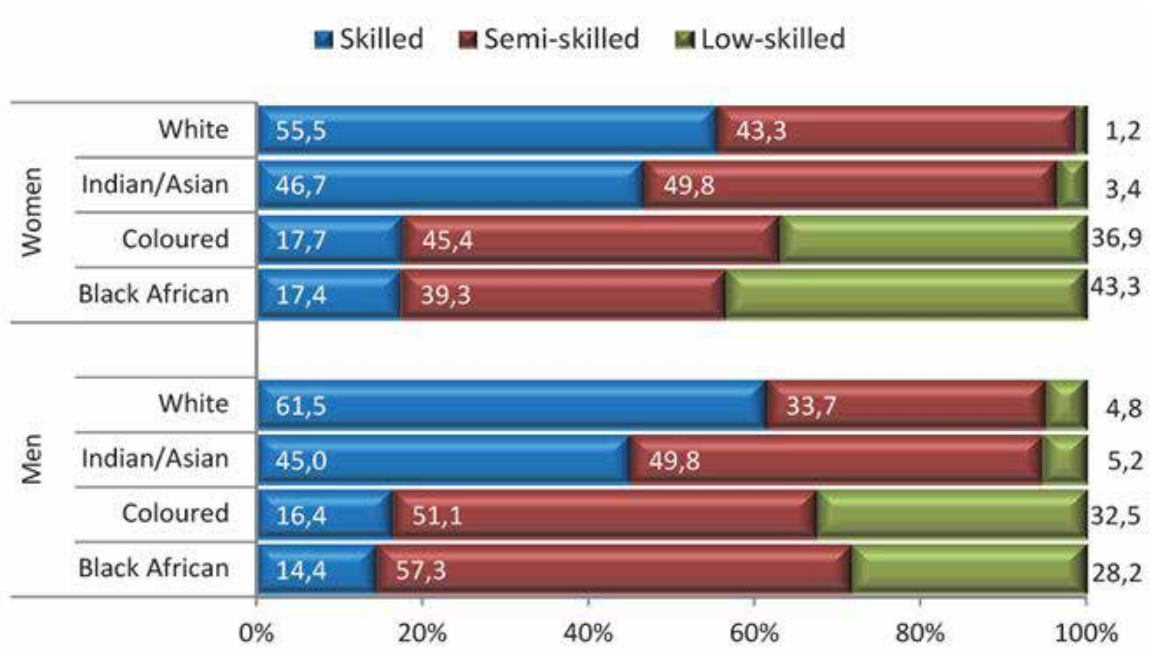
Figure 11: Employment by occupation, population group and gender.



Source: Stats SA, 2015d

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The annual increase of unit labour cost has slowed to 0.6%. More frequent and longer strikes in recent years have increased costs.

With regards to the mining industry, in the past South Africa had a good dotation of very skilled engineers (e.g. shaft sinking, ventilation, rock engineering and scientists) that made deep level mining possible, but the industry is labour intensive and reliant on low cost labour. After 1994 many skilled workers have moved abroad. There was and there is a gradual transition to more mechanised operations. In the future, it is now foreseen that there will be a continued drive for modernisation and mechanisation and thus an increased demand for skilled workforce. Presently labour costs are high and labour is unreliable due to continued strikes.

6.2.4 Interest rates

The South African Reserve Bank has been trying to keep interbank rates at around 5% in recent years. However, under inflation pressure the bank increased the rate to nearly 6% in recent months (***Figure 12***).

6.2.5 Inflation rates

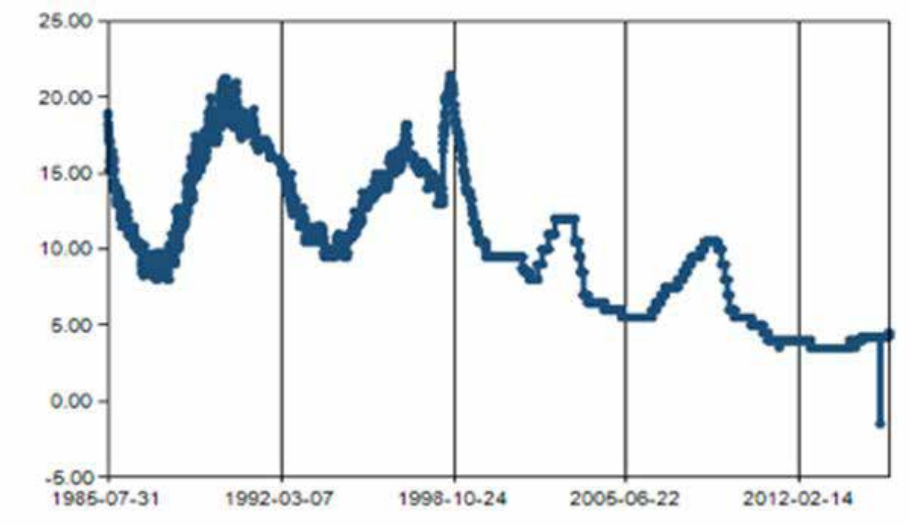
The policy of the South African Reserve Bank (SARB[3]) is to keep inflation in a band between 3% and 6%, with large excursions occurring from time to time (***Figure 13***). In 2014 the Consumer Price Index (CPI) exceeded the 6% boundary for some periods. The historic development of the CPI is given in ***Figure 13***, which shows that over the past five years the inflation rate has been relatively stable at around 5%.

Figure 14 indicates that the CPI is strongly linked to the global price development on the oil and gas market. Food prices are a multiplying factor, as these in turn depend on the oil prices due to the high level of mechanisation of South African agriculture.

South Africa's inflation outlook is affected by both domestic and global developments, most recently the adverse impact of wages and sustained exchange

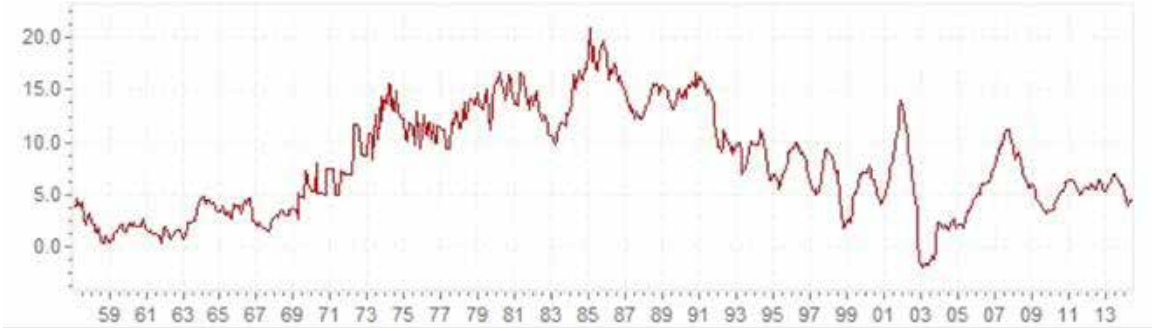
3 www.resbank.co.za

Figure 12: Historical interbank interest rates.



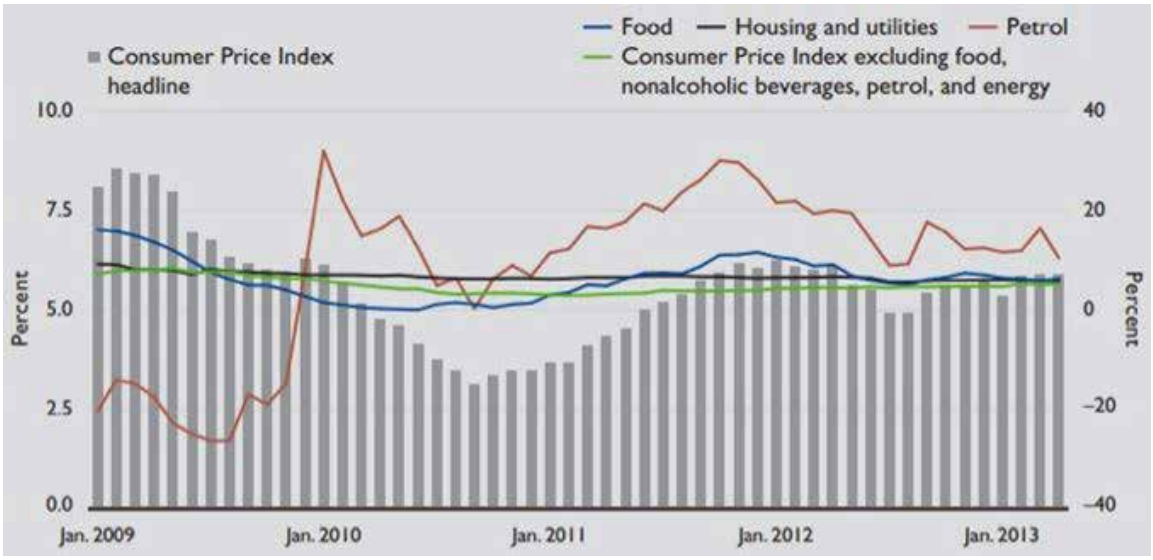
Source: www.resbank.co.za/Research/Rates/Pages/SelectedHistoricalExchangeAndInterestRates.aspx, accessed 31.07.15

Figure 13: Historic CPI inflation in South Africa.



Source: http://www.inflation.eu/inflation-rates/south-africa/historic-inflation/cpi-inflation-south-africa.aspx, accessed 31.07.15

Figure 14: Consumer Price Index for different sectors 2009-2013.



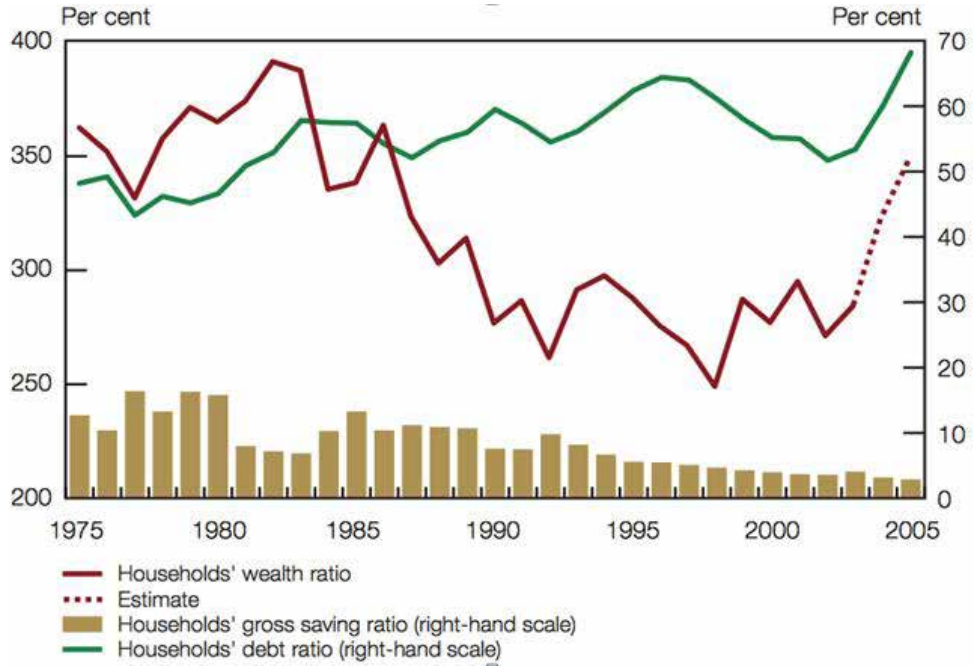
Source: StatsSA

rate depreciation on production costs and price of imported goods. While recent moderation in food prices and a lower schedule of electricity price increases were positive signs for the inflation outlook, future labour unrest, adverse shocks in major South African export destinations, and a loss of investor confidence that may further weaken the Rand, suggest a deteriorating outlook.

6.2.6 Customer liquidation and spending power

Substantial changes in equity values and the value of residential real estate over the past decades have generated interest around the world in the potential influence of household-sector wealth on the final consumption expenditure of private households. This is equally true in South Africa and the Federal Reserve Bank of South Africa commissioned two studies to shed light on this (Aron et al., 2006; Kuhn, 2010). Final consumption expenditure by households relative to gross domestic product rose from an average of 56% in the 1980s to an average of 63% between 1990 and 2005. By contrast, gross saving as a percentage of gross domestic product declined from an average of 25% during the 1980s to only 16% on average between 1990 and 2005. Likewise, gross saving by the household sector relative to gross domestic product declined from 6.5% to 3.5% on average during these respective periods. Household balance sheet evidence is likely to help explain these phenomena (***Figure 15***).

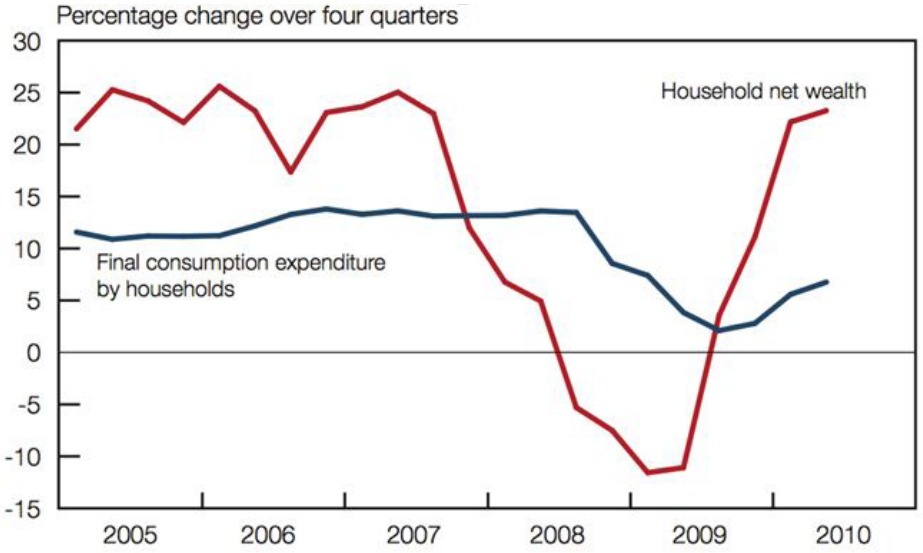
Figure 15: Households, saving, debt and wealth as % of personal disposable income.



Source: Aron et al., 2006

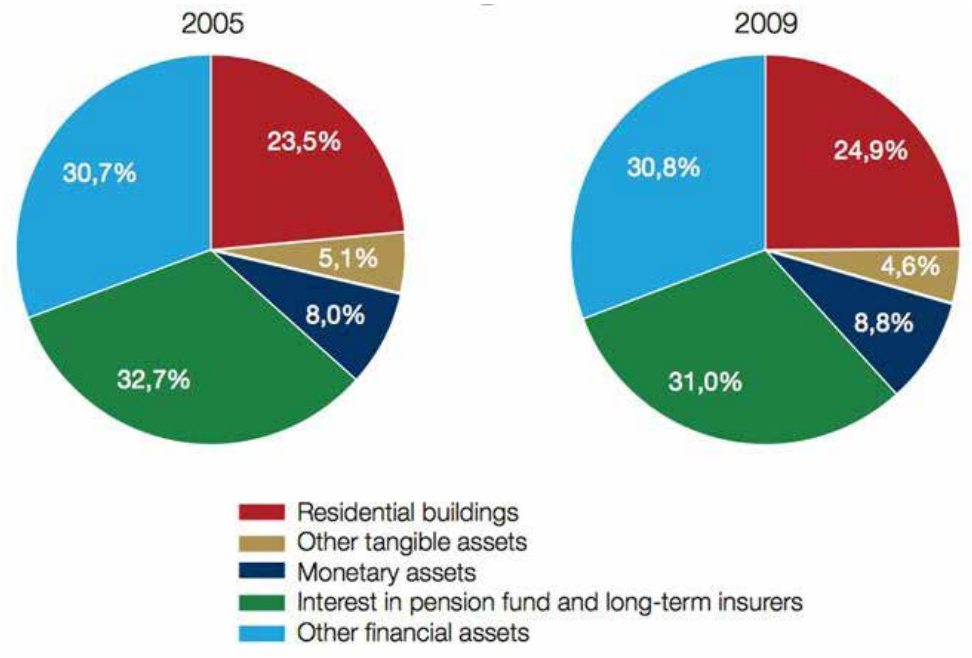
Although the ratio of household debt to disposable income in South Africa has risen sharply over the past decade, it still compares favourably with similar ratios of developed countries. Nominal final consumption expenditure by households increased at an average rate of about 13 per cent during the period 2005 to the third quarter of 2008. However, from the final quarter of 2008 final consumption expenditure of households increased at a substantially slower pace, partly explained by the decline in the net wealth of the household sector during the period and by the world economic crisis. In 2009 household wealth and consumption began to increase again (***Figure 16***). Much of the household wealth is tied up in residential buildings and other long-term interests (***Figure 17***).

Figure 16: Final consumption expenditure by households and household wealth.



Source: Kuhn, 2010

Figure 17: Household assets in South Africa.



Source: Kuhn, 2010

6.2.7 Foreign investment

South Africa is by far the largest recipient of foreign direct investment in Africa (UNCTAD, 2013). A survey conducted in the early 2000s on 162 firms (Gelb and Black, 2004) concluded that the majority of new foreign investors entering South Africa during the 1990s established small or medium size affiliates with limited impact on employment creation or capital inflows. Nearly half the entries involved acquisitions of existing operations, rather than greenfield or joint ventures setting up new enterprises. Many investors mitigated risk by limiting the irreversibility of their investment, by outsourcing production and focussing on services. Most entry was market-seeking. Many entering firms have linked with local partners with substantial market share as a risk-mitigation strategy. Investors with very large affiliates have opted for partial acquisitions, providing established market share while limiting the initial investment.

The entering firms were by and large well-established mid-sized multinationals with significant experience in developing

economies. Some may have delayed entry to South Africa until the 1990s due to political factors. The South African operating environment held few surprises for entering firms. On the contrary, the high proportion of acquisitions and the lack of concern over skilled labour shortages suggested entrants see market factors as above par by developing country standards. Affiliates also varied by mode of entry in perceptions of labour and operational inputs. Greenfield developments became more positive, while affiliates with local partners were optimistic initially but then were disappointed, possibly because their initial frame of reference was inappropriate, rather than actual conditions deteriorating. The official environment is arguably a more serious constraint than labour or input markets. The restrictions on foreign worker entry to South Africa clearly constitute a significant problem for investors, but are not the only issue of concern. In sectors where regulation is significant, firms rated the administrative environment poor at entry, and their anxieties increased later. But affiliates satisfied with their performance were positive about official procedures, while strong performers were happy with governance. Sectoral location also matters. In manufacturing, there was a high percentage of less satisfied firms, even though market shares increased and domestic firms were thought by affiliates to have deteriorated since entry. Performance rating here is probably linked to slow overall growth, and there are some grounds for concern about foreign investors squeezing local firms out of the market.

The stabilising situation since Gelb and Black (2004) conducted their survey is reflected in the World Bank ranking for conducting business (World Bank, 2015) in which the country ranked 43rd out of 189 countries, as noted above. The consulting firm Kearney ranked South Africa 13th among 25 countries surveyed for their '2014 FDI Confidence Index®' (A.T. Kearney Inc., 2014). This report states the country received US$4.5 billion in 2012 after a bounce of US$5.8 billion in 2011. British Petroleum (BP) announced in April 2013 that it will invest US$550 million in its refinery, terminal, and service station retail network assets over next five years. BP will partner with South African retail giant Pick n Pay to open 120 Pick n Pay Express stores across the country, mimicking similar ventures between South Africa's Woolworths and Engen and between Fruit & Veg City and Caltex. In May 2013, Google made its first renewable energy deal in Africa with a US$12 million solar investment in Northern Cape Province. Chinese foreign direct investments stock in Africa stood at US$16 billion at the end of 2011 with South Africa as the leading recipient of Chinese foreign direct investments in the continent, followed by the Sudan, Nigeria, Zambia and Algeria (UNCTAD, 2013). South Africa is also a major recipient of regional foreign direct investment (in the order of US$4.6 billion in 2012, UNCTAD, 2013). However, the volume of foreign direct investments is comparatively small, so that the action of single companies, e.g. mining companies, has a major effect on the balance.

According to UNCTAD (2013) South Africa itself is among the largest investors in the rest of Africa holding stock in the order of US$18 billion in 2011. Mauritius, Nigeria and its neighbours Zimbabwe and Mozambique are the main target countries. For instance, Anglo American divested into Zimbabwe and Chile.

6.2.8 Public finance situation

The public debt of 47% of GDP is lower than many OECD countries, but has been steadily rising over the last two decades. This increase could be explained by higher issuances of debt instruments, which included discounts, revaluations and the impact of the exchange value of the rand on foreign debt in particular. Financing the budget deficit through the issuance of domestic and foreign debt instruments continues to increase the total gross loan debt of the national government. This trend is also partly due to the high number of jobs in the public sector which accounts for around 20% of the employed (see above). The key budget data, also with respect to GDP, are summarised in ***Table 9***.

Table 9: Main budget framework.

Table 1 Main budget framework: 2011/12 to 2017/18

R million	Audited outcome 2011/12	2012/13	2013/14	Revised estimate 2014/15	Medium-term estimates 2015/16	2016/17	2017/18
Revenue (National Revenue Fund)							
Tax revenue (gross)	742 649.7	813 825.8	900 013.5	979 000.0	1 081 275.0	1 179 199.4	1 289 711.0
Departmental and other receipts, and repayments	24 401.5	28 467.7	30 626.1	27 006.5	19 037.5	23 301.7	21 142.7
Less: Southern African Customs Union (SACU) payments	-21 760.0	-42 151.3	-43 374.4	-51 737.7	-51 021.9	-36 513.3	-45 444.3
Total revenue	**745 291.2**	**800 142.2**	**887 265.1**	**954 268.8**	**1 049 290.6**	**1 165 987.9**	**1 265 409.4**
Percentage of GDP	*24.2%*	*24.0%*	*24.6%*	*24.6%*	*25.0%*	*25.7%*	*25.7%*
Expenditure							
Debt-service costs	76 460.0	88 121.1	101 184.7	115 016.2	126 440.4	140 970.9	153 376.0
Percentage of GDP	*2.5%*	*2.6%*	*2.8%*	*3.0%*	*3.0%*	*3.1%*	*3.1%*
Current payments[2]	150 242.9	162 063.8	179 211.2	190 683.9	197 738.6	210 587.3	222 654.2
Transfers and subsidies	648 449.0	696 837.2	749 459.2	810 255.5	872 977.9	925 645.3	980 145.4
Payments for capital assets[2]	11 957.1	13 848.9	14 008.5	15 466.0	16 696.1	17 395.4	19 321.7
Payments for financial assets	2 802.5	4 624.5	3 900.2	3 700.0	3 491.7	345.5	365.1
Unallocated reserves	–	–	–	–	5 000.0	15 000.0	45 000.0
Total expenditure	**889 911.5**	**965 495.6**	**1 047 763.8**	**1 135 121.6**	**1 222 344.7**	**1 309 944.4**	**1 420 862.4**
Percentage of GDP	*28.9%*	*29.0%*	*29.0%*	*29.3%*	*29.2%*	*28.9%*	*28.8%*
Main budget balance[3]	**-144 620.2**	**-165 353.3**	**-160 498.7**	**-180 852.8**	**-173 054.1**	**-143 956.5**	**-155 453.0**
Percentage of GDP	*-4.7%*	*-5.0%*	*-4.4%*	*-4.7%*	*-4.1%*	*-3.2%*	*-3.2%*
GDP	3 080 887.0	3 327 630.0	3 609 844.0	3 879 920.1	4 191 752.4	4 538 780.0	4 926 133.5

1. Payment to SACU partners in respect of a previous error in calculation of the 1969 agreement.
2. Excludes conditional allocations to provinces and local government; these are included in transfers and subsidies.
3. A positive number reflects a surplus and a negative number reflects a deficit.

Source: National Treasury, 2015a

Public sources of income and the distribution of the state budget over the different sectors is summarised in ***Table 10***. It is evident that nearly 20% of the spending is not covered by the projected income.

Table 10: Projected public income and public spending for 2015/16.

Source of income	*[Billion Rand]*	*[%]*	*Public sector*	*[Billion Rand]*	*[%]*
Personal income tax	*393.9*	*36.4*	*Economic affairs*	*206*	*15.3*
Corporate income tax	*202.0*	*18.7*	*Basic education*	*203*	*15.0*
VAT	*283.8*	*26.2*	*Development and Social infrastructure*	*200*	*14.8*
Customs and excise duties	*76.1*	*7.0*	*Defence, public order and safety*	*171*	*12.7*
Fuel levies	*55.7*	*5.1*	*Health*	*157*	*11.6*
Other	*69.8*	*6.5*	*Social protection*	*155*	*11.5*
			Other	*131*	*9.7*
			Post-school education and training	*62*	*4.6*
			General public services	*64*	*4.7*
Total	*1081.3*	*100*	*Total*	*1349*	
			Deficit	*-268*	*19.8*

Source: National Treasury, 2015b

6.3 Energy and Infrastructure

6.3.1 Energy system, consumption & access

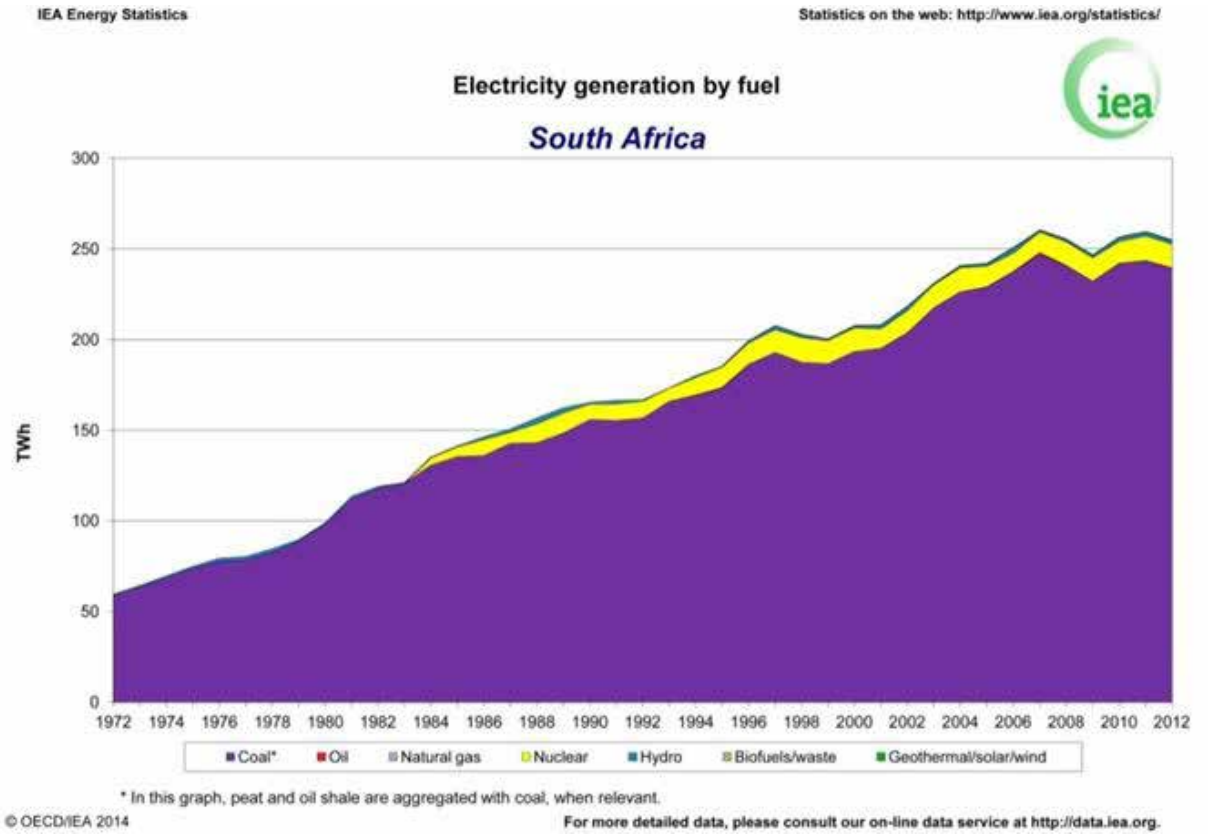
In 2012 the total energy production of South Africa was 170 Mtoe[4], of which 22 Mtoe were exported and which resulted in the release of 380 Mt CO_2. In the same year South Africans and their industry consumed 230 TWh electricity (International Energy Agency (IEA)[5] accessed 24.08.15). The country is part of the Southern African Power Pool (SAPP), with extensive interconnections. Total installed generating capacity in the SAPP countries is 55 GWe, of which around 80% is South African. South Africa is a net exporter of coal, but can only meet 23% of its own gas needs and a negligible fraction of its oil needs. Renewable energies, such as water or wind are of marginal importance and have hardly been developed over the last few years (IEA[6], accessed 24.08.15). South Africa generates 94% of its electricity in coal-fired power stations (***Figure 18***).

4 Mtoe, one million toe or megatoe.The tonne of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one tonne of crude oil. It is approximately 42 gigajoules (GJ).

5 www.iea.org/statistics/statisticssearch/report/?country=SOUTHAFRIC&product=indicators&year=2012

6 www.iea.org/statistics/statisticssearch/report/?year=2012&country=SOUTHAFRIC

Figure 18: Electricity generation by fuel.



Source: www.iea.org/stats/WebGraphs/SOUTHAFRIC2.pdf.

This high-carbon footprint electricity generation is encouraged by the fact that the country has around 3.4% of the world coal reserves (WEC 2013). The electricity sector is dominated by the national utility Eskom, which owns and operates most of the national electricity generation infrastructure and supplies 95% of the country's electricity requirements. The balance is supplied by municipalities and redistributors (4%), as well as private generators (1%). Electricity infrastructure comprises three sub-sectors: generation, transmission and distribution.

In terms of generation, as mentioned previously, Eskom dominates the pro-

duction of electricity, with a generation infrastructure comprising thirteen coal-fired power stations. These power stations (35,000 MW) account for 85% of Eskom's total net maximum capacity (41,000 MW). Most power stations are located in Mpumalanga due to the occurrence of the coal, with the exception of Lethabo and Matimba which are located in the Free State and Limpopo respectively. Eskom was converted into a public company on 1 July 2002. It is financed by net financial market liabilities and assets as well as reserves. While Eskom does not have exclusive generation rights, it has a practical monopoly on bulk electricity. It also operates the integrated national high-voltage transmission system and supplies electricity directly to large consumers, such as mines, mineral beneficiators and other large industries. In addition, it supplies electricity directly to commercial farmers and, through the Integrated National Electrification Programme (INEP), to a large number of residential consumers. It sells in bulk to municipalities, which distribute to consumers within their boundaries. Access to electricity in 1994 was at 34%. Since 1994 INEP made it possible to electrify 6 million households, which amounts to 88% access to electrification nationwide[7]. Through a new household electrification strategy the Department of Energy (DoE) expects to achieve universal access by 2025. In 2011 Eskom had more than 300,000 km of power lines, of which 29,000 km constitute the national transmission grid. Around 5% of the electricity is generated by South Africa's two nuclear power plants (www.world-nuclear.org/info/Country-Profiles/Countries-O-S/South-Africa/).

South Africa has a very diverse electricity market. Electricity consumers vary from high energy intensive users (units of energy consumed per unit of GDP produced) such as deep level mines, non-ferrous smelters, ferroalloy smelters, basic iron and steel plants; to low energy intensive users such as commercial and residential consumers. Although the economy has historically been characterised by high energy intensity, its structure has changed over time due to the growing contribution of the services sector to economic output.

Tariffs are regulated by the National Energy Regulator of South Africa (NERSA[8]). As mentioned previously, South Africa has, since 2007, faced electricity supply challenges. Inadequate generation capacity is exacerbated by the fact that some power stations are approaching the end of their lifespan, resulting in substantial operational inefficiencies. The 2010 Integrated Resource Plan (IRP) 2010-30 was promulgated in March 2011. It was indicated at the time that the IRP should be a 'living plan' which would be revised by the DoE every two years. Since the promulgation of the Integrated Resource Plan (IRP) 2010-30 there have been a number of developments in the energy sector in South and Southern Africa. The electricity demand outlook has changed markedly from that in 2010. A revised economic and electricity sector outlook has been developed to inform decisions required in the lead-up to a new iteration of the IRP (which will also be influenced by the approved Integrated Energy Plan) expected in 2014[9]. The demand in 2030 is now projected to be in the range of 350-410 TWh as opposed to 450 TWh expected in the policy-adjusted IRP. From a peak demand perspective this means a reduction from 68,000 MW to 61,000 MW (on the upper end of the range), with the consequence that at least 6600 MW less capacity is required (in terms of reliable generating capacity). The revised IRP assumes a delay in a decision on new nuclear capacity and at the same time relies on more efficient utilisation of coal.

In the meantime, 'load shedding' due to high demands increasingly plagues the South African electricity grid. Decreasing demands due to the less favourable economic development somewhat alleviated the situation. Eskom struggled to meet demands by employing more open-cycle gas fired power plants and delaying maintenance on existing generating capacity, for which the price will have to be paid later.

7 www.energy.gov.za

8 www.nersa.org.za

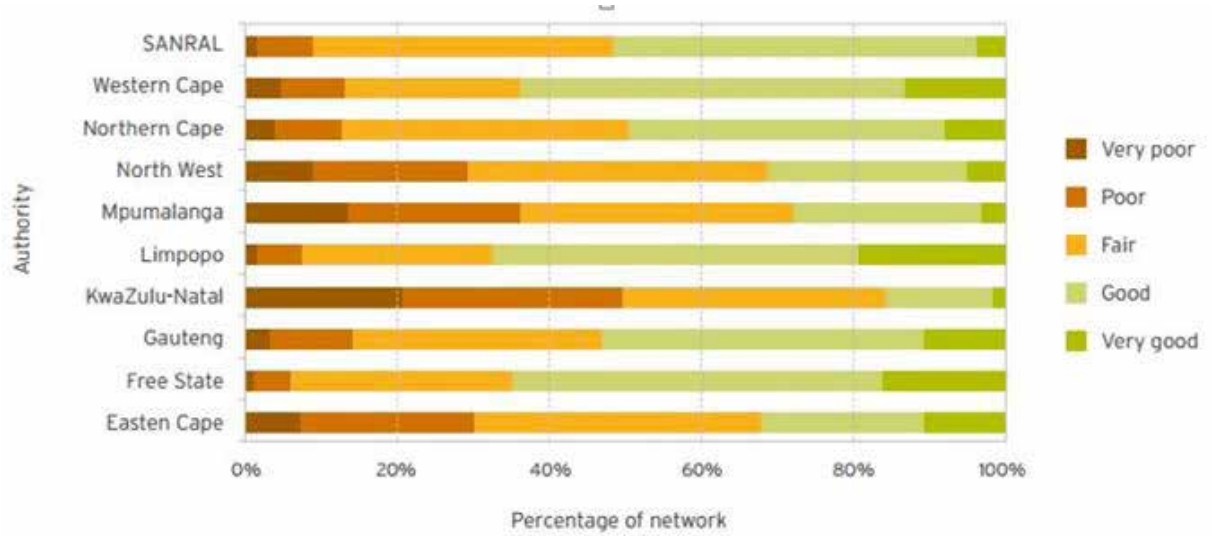
9 www.doe-irp.co.za/content/IRP2010_updatea.pdf

6.3.2 Transport infrastructure

6.3.2.1 Road infrastructure

The road network comprised in 2014 (CIA, 2015) a total of 750,000 km, of which 160,000 km were paved and 590,000 km unpaved which are proclaimed as national, provincial or municipal roads. Un-proclaimed roads account for 33% of the total gravel network. The "un-proclaimed" roads are predominantly in rural areas, have not been officially recorded in road inventories, and no authority is responsible for their maintenance and upgrading (DPME, 2012). The state of the roads is highly variable and only half of the network can be considered to be in a good or very good (10%) state (***Figure 19***).

Figure 19: Road conditions in different Provinces and of SANRAL.



Source: Perkins et al., 2005

The South African National Roads Agency Limited (SANRAL[10]) is responsible for all national roads, comprising 11% of the total paved network. The main function of national roads is to provide mobility to promote economic development and stimulate exports. In recent years, more and more provincial roads have been transferred to SANRAL due to the lack of capacity in (and funding from) provincial road authorities. SANRAL's target is to increase its inventory from 16,000 km to 38,000 km by taking over provincial roads of national importance.

Road maintenance has been chronically underfunded and the government intends to raise funds through increasing existing road tolls and introducing new ones. However, this policy met with severe public resistance, even forcing the cutting of road tolls in metropolitan areas. The imposition of fees was delayed for more than two years largely due to opposition from unions and other groups, and several legal challenges, arguing that the roads are not new roads and their base structure has already been paid off[11].

6.3.2.2 Rail infrastructure

The railway network (***Figure 20***) comprised a total of 20,000 km of which nearly all are narrow gauge (1.065 m gauge). Most of the network is served by diesel traction and only 8,200 km are electrified (CIA, 2015). The commuter network is largely electrified. The inter-city tracks and some urban networks are owned by Transnet. However, the majority of the urban rail infrastructure is owned by the Passenger Rail Agency of South Africa (PRASA[12]).

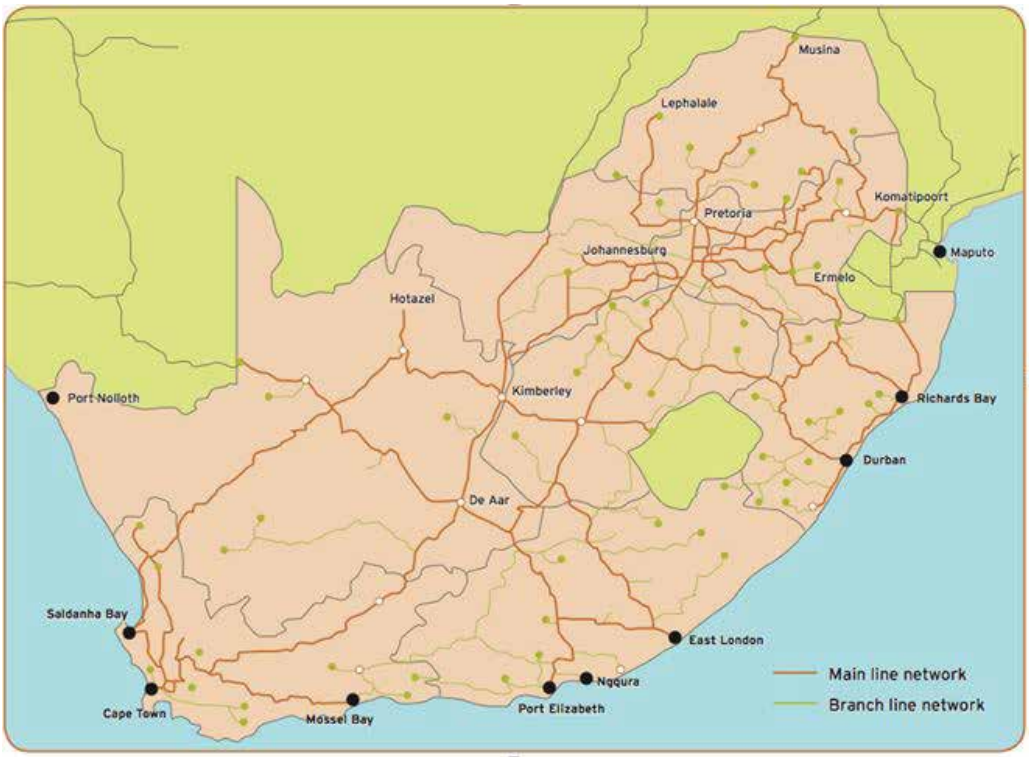
The growth of railway line construction, as measured in route kilometres, grew steeply relative to per capita GDP until

10 www.nra.co.za/

11 www.bloomberg.com/news/articles/2015-05-20/south-africa-cuts-electronic-toll-fees-after-consumer-opposition

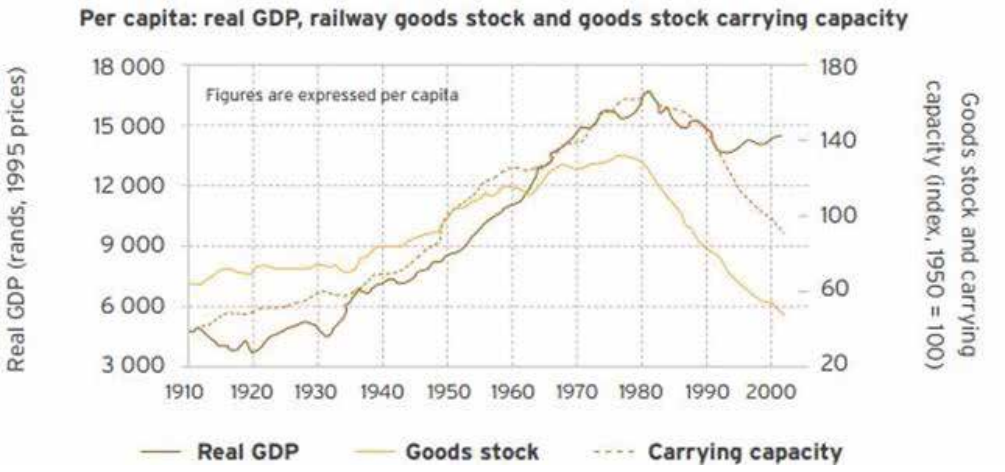
12 www.prasa.com

Figure 20: The railway network of South Africa.



Source: DPME, 2012

Figure 21: Per capita real GDP, railway goods stock and goods stock carrying capacity.



Source: Perkins et al., 2005

1925. Thereafter it declined. Hence most of the existing network (over 90%) was completed by 1925. While the fall in both GDP per capita growth and rail capacity growth after 1980 coincides with the impact of the sanctions period, deregulation of freight transport took place at about the same time and hence is also a factor in the steep decline in rail use. By 2003, neither rail carrying capacity nor goods stock recovered to match the post sanctions recovery in GDP growth. This suggests that GDP growth has become less dependent on rail capacity than it was in the earlier years of economic development (***Figure 21***). Similar pictures can be observed in many parts of the world, where road transport superseded rail transport, in spite of lower costs per km, due to its higher flexibility and ability to reach more remote locations without changing the mode of transport. With regards to the transport of bulk commodities there is good railroad infrastructure.

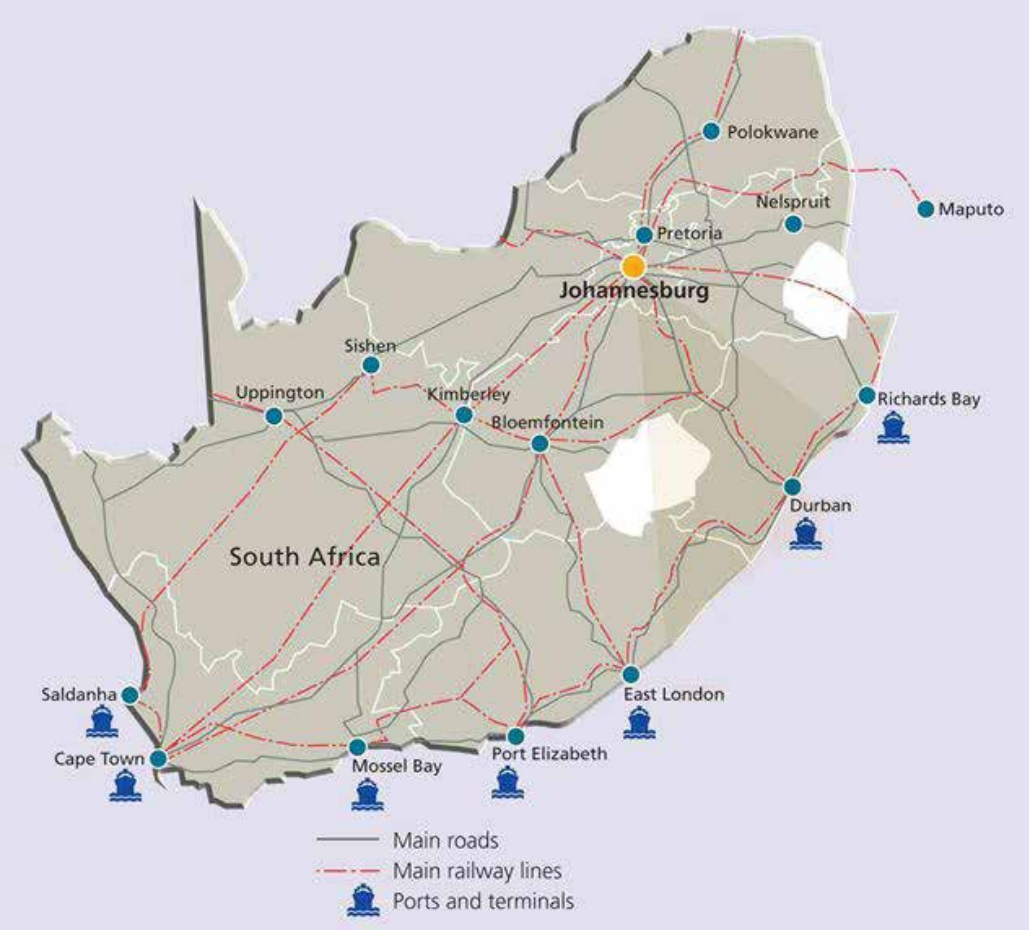
Examples include the Sishen-Saldanha railroad for iron ore transportation and the Richards Bay railroad for coal transportation.

6.3.2.3 Port infrastructure

Major seaports are Cape Town, Durban (container terminal), Port Elizabeth, Richards Bay (coal terminal) and Saldanha Bay (iron ore terminal), as well as Mossels Bay as a terminal for Liquified Natural Gas (LNG) imports, as mentioned previously (***Figure 22***). All these ports are owned by the National Ports Authority (TNPA[13]), a division of Transnet. As the national planning authority, Transnet divides the ports into three groups: the Western, Central and Eastern ports.

13 www.transnetnationalportsauthority.net

Figure 22: The ports of South Africa and the connecting road and rail network.



Source: http://joburg.org.za/images/stories/2009/december/roads_railways_ports.jpg

Commercial ports are a complex blend of physical infrastructure and operational services. Moreover, they function as one part of an intricate logistics framework within a commercial and economic environment. It is often difficult to draw a clear line between port infrastructure and that of the many port-related service industries that are typically co-located with the port. Hence, it is not only the scale or physical capacity of the infrastructure that determines the effectiveness of the ports; rather, it is the efficiency with which they serve their users within an environment that measures their value in serving the national economy. South Africa's ports cover a wide variety of functions. Some of them focus almost exclusively on bulk commodities, such as ore exporting/petroleum importing at Saldanha Bay. Others serve one major industry only, such as the off-shore oil industry in the case of Mossel Bay. Yet others may specialise in one cargo type, but also have facilities for a wide range of commodity types. Durban was previously the largest

container handling facility in the southern hemisphere (overtaken in recent years by Jakarta, Indonesia). It is also the country's largest petroleum handling port, with a wide range of dry bulk and mixed use cargo services.

7. Political and legal factors

7.1 Political factors

7.1.1 Administrative structure

South Africa is a constitutional democracy with a three-tier system of government and an independent judiciary (***Table 11***). The national, provincial and local levels of government all have legislative and executive authority in their own spheres and are defined in the Constitution as "distinctive, interdependent and interrelated". Operating at both national and provincial levels are advisory bodies drawn from South Africa's traditional leaders. It is a stated intention in the Constitution that the country be run on a system of cooperative governance.

The country is subdivided into 9 provinces (***Figure 23***). Provinces have the power to pass legislation in various fields enumerated in the national constitution; in some fields the legislative power is shared with the national parliament, while in others it is reserved to the province. These province level fields include such matters as health, education (except universities), agriculture, housing, environmental protection, and development planning. In fields outside the power of a provincial legislature, provinces may recommend legislation to the National Assembly.

Table 11: Legislative, executive and judicial authorities.

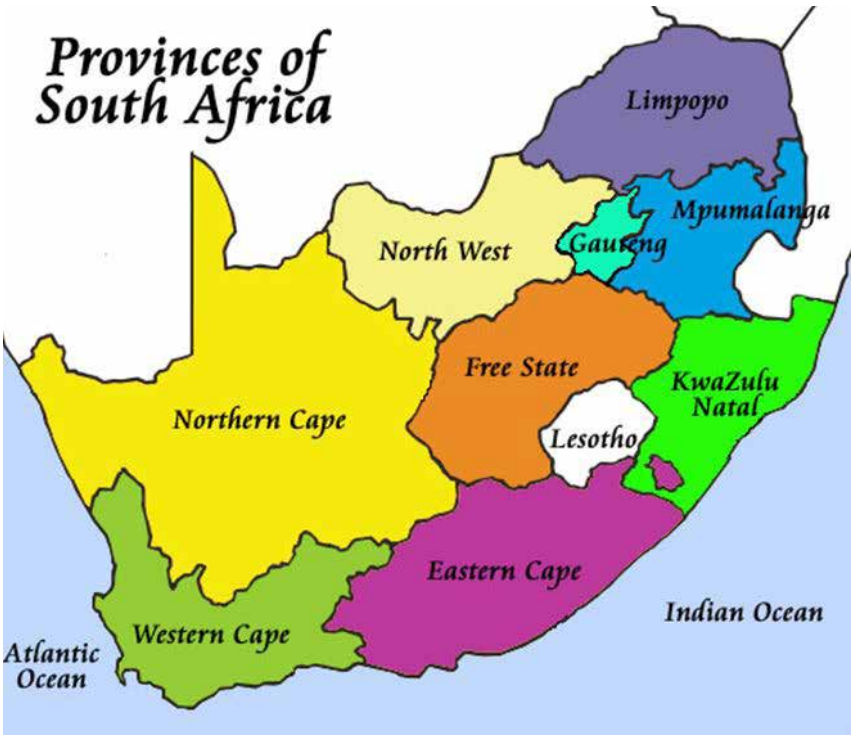
Legislative authority	
Parliament (national)	• *National Assembly (350 – 400 members)* • *National Council of Provinces (90 delegates)*
Provincial Legislature	
Executive authority	
President	• *Deputy President*
• *Cabinet (national)*	• *Ministers*
Provincial executive councils	
• *Premier*	• *Members of the Executive Council*
Judicial authorities	
• *Constitutional Court* • *Supreme Court of Appeal*	• *High courts* • *Magistrate's courts*
State institutions supporting democracy	
• *Public Protector* • *Auditor-General* • *Human Rights Commission* • *Commission for Gender Equality*	• *Commission for the Promotion and Protection of the Rights of Cultural, Religious and Linguistic Communities* • *Independent Communications Authority of South Africa*

Source: www.gov.za/about-government/government-system/structure-and-functions-south-african-government

7.1.2 Governmental stability & transparency

According to Global competitiveness report 2014-15 (World Economic Forum, 2014), South Africa ranks 90 in a list of 144 countries in 'public trust in politicians'. In the area of corruption, South Africa is ranked 96th. To what extent do government officials show favouritism to well-connected firms and individuals when deciding upon policies and contracts, it ranks

Figure 23: The Provinces of South Africa.



Source: www.exploresouthafrica.net/images/provmap.jpg

104th. However in the same report, for the question of how easy is it for businesses to obtain information about changes in government policies and regulations affecting their activities, South Africa ranks 35th which shows that at least in this respect it is above average transparency rankings in policies. This also reflected in the rank of South Africa in Transparency International Corruption Perceptions Index (Transparency International, 2015), for which it was 67 out of 174 countries in the 2015, a slight improve compared to 2012, where it was 69th out of 176 countries. South Africa now ranks as the 9th least corrupt country in Africa, below Lesotho and Rwanda. The government has put mechanisms in place to fight corruption, including the creation of the independent Public Protector Office, which has investigated a number of high profile corruption cases in recent years, leading to effective sanctions.

As mentioned earlier, the African National Congress (ANC) has dominated party politics since the first free elections in 1994. However, tensions have emerged in the so-called tripartite alliance between the ANC, the Congress of South African Trade Unions (COSATU) and the South African Communist Party (SACP). New parties that gained ground left and right of the ANC are emerging in the diverse political landscape of around a dozen political parties in the parliament. The position of the current president Zuma (since 2009) has also been weakened by corruption allegations dating back to 1997. The weak economic situation is likely to make South African politics somewhat more volatile, although the emergence of a stronger and more diversified opposition has been welcomed by many.

7.1.3 Fiscal policies

Unlike in many other developing countries, by far the bulk of national government revenue in South Africa consists of tax revenue, while transfers and ordinary income from the sale of goods and services are comparatively insignificant (cf ***Table 10***). Government revenue is therefore highly dependent on the size of the tax base, the rate of taxation and the growth in income, profits, domestic expenditure and imports. Given a fixed tax base and tax rates, changes in government revenue are consequently correlated fairly closely with changes in economic activity. The Industrial Policy Action Plan (IPAP, DTI, 2014) supports agriculture

and mining and seeks to strengthen the competitiveness, productivity and trade performance of the core productive sectors of the economy. Relevant research and technology development continues to be supported through tax incentives. With regards to the mining industry, in the past and at present, South Africa's fiscal framework is stable. It encourages repatriation of profits for all industries, and does not make any special concessions to the mining industry.

7.1.4 Government spending priorities & allocation

The annual volume of capital investment by public enterprises has increased by more than 260% in real terms over the past 10 years. Local government's annual infrastructure spending has more than doubled in real terms since the late 1990s. The public sector has invested over R1 trillion in infrastructures since 2009/10 (National Treasury, 2015a). The government has significantly increased social expenditure, notably in the expansion of social assistance grants and the implementation of antiretroviral therapy to combat HIV/AIDS, which has contributed to a recovery of life expectancy from 52 years a decade ago to 60 years today. About 16 million South Africans now receive some form of social assistance. Social services have grown, with public employment increasing by 56,000 in health, 40,000 in criminal justice and 15,000 in education over the last five years. The government devotes significant resources to industrial development and transformation, helping to boost output and employment. Tax and other incentives to support special economic zones are being developed. These zones are intended to promote value-added exports and generate jobs in economically disadvantaged parts of the country (National Treasury, 2014). An overview over the current government budget is provided in ***Table 10***.

7.1.5 National Security

The South African National Defence Force (SANDF[1]) was created in 1994, as an all-volunteer force composed of the former South African Defence Force, the forces of the African nationalist groups (Umkhonto we Sizwe and Azanian People's Liberation Army), and the former Bantustan defence forces. South Africa is the only African country to have successfully developed nuclear weapons. South Africa undertook a nuclear weapons programme in the 1970s. After the end of the Cold War and apartheid, it became the first country (followed by the Ukraine) with nuclear capability to voluntarily renounce and dismantle its programme and in the process signed the Nuclear Non-Proliferation Treaty (NPT[2]) in 1991. South Africa has in the past been involved in the civil wars of neighbours such as Namibia and Mozambique, but with the conflicts being settled there are currently little threats to its borders. Nearly 13% of the state budget is spent on national security and internal safety (cf. ***Table 10***).

7.1.6 Safety & crime

South Africa remains a violent society according to the South African Police Service statistics as shown in ***Table 12***. It is around 30 times as probable to become a murder victim in South Africa as compared to central Europe. However, only half of the murder attempts are successful. About one in a hundred people annually become the victim of some form of violent crime.

Crime rates and types of crime are not evenly distributed over the South African society, where township and informal settlements are more seriously affected. Middle-class South Africans may seek security in gated communities. The private security industry in South Africa is the largest in the world, with nearly 9,000 registered companies and 400,000 registered active private security guards, more than the South African police and army combined. Many emigrants from South Africa also state that crime was a big motivator for them to leave. Crime against the farming community has continued to be a major problem.

In case of organised crime, the Global Competitiveness Report 2014-15 (World Economic Forum, 2014) ranks South Africa 99th, indicating that it has mild issues compared to other countries. Unlike in

1 www.dod.mil.za

2 www.un.org/disarmament/WMD/Nuclear/NPT.shtml

Table 12: Excerpt from the South African Police Service statistics for 2013/14.

Crime	Cases	Cases per 100,000 Inhabitants
Murder	17068	32,2
Attempted murder	17110	32,3
Sexual offences	62649	118,2
Assault with grievous bodily harm	183173	345,7
Common assault	167157	315,5
Common robbery	53858	101,7
Aggravated robbery	119351	225,3
Carjacking	11221	21,2
Lorry hijacking	991	1,9
Burglary	260460	491,6
Drug related crimes	260732	492,1
Kidnapping	4158	7,8

Source: www.saps.gov.za/resource_centre/publications/statistics/crimestats/2014/download/individual_crime_cat_2014.xls

neighbouring Zimbabwe, land-grabbing from white farmers has not been a serious issue in South Africa yet. Land-grabbing and illegal, informal settlement mainly occurs on urban, industrial, and mining waste land. While the government so far has prevented land-grabbing, its stance is somewhat ambiguous, given the widespread lack of adequate housing for large segments of the population.

7.1.7 Trade policies

South Africa is a relatively open economy, only 'moderately' protected by tariffs. In the early 1990s, South Africa's average tariff was around 23%. It now stands at 7.7%. In 2006, the proportion of zero-rated tariff lines rose to about 54%. There has also been considerable simplification of the tariff regime. In 1990, the tariff schedule consisted of 14,000 tariff lines and 28% were subject to import control. By 2006, the number of tariff lines had been reduced to 6400, a decline of 53%, and import controls were eliminated (ITAC, 2010). The South African Trade Policy and Strategy Framework of 2010 (ITAC, 2010) recommends that tariffs on mature upstream input industries could be reduced or removed to lower the input costs for the downstream, more labour creating manufacturing sector. Tariffs on downstream industries, particularly those that are strategic from an employment or value-addition perspective, may be retained or raised to ensure long-term sustainability and job creation in the context of domestic production capabilities and the degree of trade and production distortions on these products at the global level. Compared to its trading partners, the tariff regime is quite transparent and not overly complex. World Trade Organisation (WTO) services commitments are on par with OECD countries.

South Africa ranks amongst the most open jurisdictions for foreign direct investments in the world and provides strong protection to investors in line with high international standards (cf.World Bank, 2015). Some important trade agreements include SADC Free Trade Area (FTA) established in 2008, the SA-EU Trade, Development and Cooperation Agreement; now revised as part of Economic Partnership Agreement, Southern African Customs Union (SACU)-European Free Trade Association (EFTA) FTA, SACU-Mercosur Preferential Trade Agreement, and SACU-India Preferential Trade Agreement (under negotiation).

7.1.8 Bilateral, Multilateral & International agreements

Prior to 1994 the membership of South Africa in many international organisations

had been suspended and since then gradually re-established (***Table 13***). In addition to its membership in organisations on a global level, the country is a (leading) member in regional, African associations and organisations. South Africa is also party to many international treaties and agreements.

Table 13: South African membership in international organisations and associations.

ACP	*African, Caribbean, and Pacific Group of States*	*IPU*	*Inter-Parliamentary Union*
AfDB	*African Development Bank*	*ISO*	*International Standardization Organisation*
AU	*African Union*	*ITSO*	*International Telecommunications Satellite Organization*
BIS	*Bank for International Settlements*	*ITU*	*International Telecommunication Union*
BRICS	*Association of five major emerging economies: Brazil, Russia, India, China and South Africa*	*ITUC*	*International Trade Union Confederation*
CD	*Conference on Disarmament*	*MIGA*	*Multilateral Investment Guarantee Agency*
CTBTO	*Comprehensive Nuclear-Test-Ban Treaty Organisation*	*MONUSCO*	*Mission de l'Organisation des Nations unies pour la stabilisation en République démocratique du Congo*
ECOWAS	*Economic Community of West African States*	*NAM*	*Non-aligned movement*
FAO	*UN Food and Agricultural Association*	*NSG*	*Nuclear Suppliers Group*
FATF	*Financial Action Task Force*	*OECD*	*Organisation for Economic Co-operation and Development*
G-20	*Group of Twenty*	*OPCW*	*Organisation for the Prohibition of Chemical Weapons*
G-24	*Intergovernmental Group of Twenty-Four on International Monetary Affairs and Development*	*Paris Club*	*(associate)*
G-5	*Group of Five (largest emerging economies)*	*PCA*	*Permanent Court of Arbitration*
G-77	*Group of 77 (Developing Countries)*	*SACU*	*Southern African Customs Union*
IAEA	*International Atomic Energy Agency*	*SADC*	*Southern Africa Development Community*
IBRD	*International Bank for Reconstruction and Development*	*UN*	*United Nations*
ICAO	*International Civil Aviation Organization*	*UNAMID*	*African Union/UN Hybrid operation in Darfur*
ICC	*International Criminal Court*	*UNCTAD*	*United Nations Conference on Trade and Development*
ICCt	*International Conference on Communication Technology*	*UNESCO*	*United Nations Education, Science, and Cultural Organisation*
ICRM	*Institute of Certified Records Managers*	*UNHCR*	*United Nations High Commissary for Refugees*

IDA	*International Development Association*	*UNIDO*	*United Nations Industrial Development Organisation*
IFAD	*International Fund for Agricultural Development*	*UNITAR*	*United Nations Institute for Training and Research*
IFC	*International Finance Corporation*	*UNWTO*	*United Nations World Tourism Organization*
IFRCS	*International Federation of Red Cross and Red Crescent Societies*	*UPU*	*Universal Postal Union*
IHO	*International Hydrographic Organization*	*WCO*	*World Customs Organization*
ILO	*International Labour Organisation*	*WFTU*	*World Federation of Trade Unions*
IMF	*International Monetary Fund*	*WHO*	*World Health Organisation*
IMO	*International Maritime Organisation*	*WIPO*	*World Intellectual Property Organization*
IMSO	*International Mobile Satellite Organization*	*WMO*	*World Metereological Organisation*
Interpol	*International Criminal Police Organization*	*WTO*	*World Trade Organisation*
IOC	*International Olympic Committee*	*ZC*	*Zangger Committee (Nuclear Exporters Committee)*
IOM	*International Organization for Migration*	-	-

Source: CIA, 2015

7.1.9 Sustainable development policies

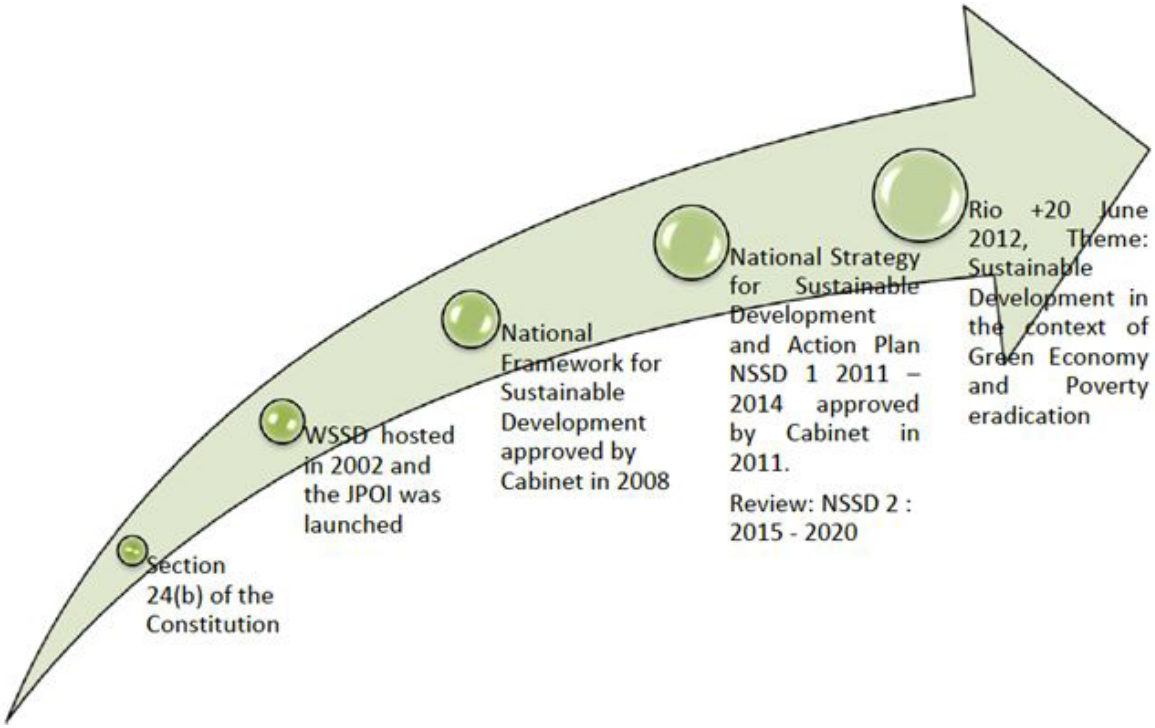
In 2008 the South African government approved the National Framework for Sustainable Development (NFSD), which was aimed at promoting the effective stewardship of South Africa's natural, social and economic resources. The National Strategy for Sustainable Development and Action Plan (NSSD 1, DEA, 2011) for the years 2010 to 2014 builds on the NFSD and several other initiatives (cf. ***Figure 24)*** that have been launched by the business sector, government, NGOs, civil society, academia and other key role players to address issues of sustainability in South Africa.

According to the NSSD 1 the goals are to:

- develop and promote new social and economic goals based on ecological sustainability and build a culture that recognises that socioeconomic systems are dependent on and embedded in ecosystems;
- increase awareness and understanding of the value of ecosystem services to human well-being;
- ensure effective integration of sustainability principles into all policies, planning and decision-making at national, provincial and local levels;
- ensure effective system-wide integration and collaboration across all functions and sectors;
- monitor, evaluate and report performance and progress in respect of ecological sustainability in relation to socioeconomic goals.

The NSSD 1 co-ordinates with the National Planning Commission, the New Growth Path and the Industrial Policy Action Plan. As a measure of progress a set of development indicators were established in 2010. They are clustered into ten themes: economic growth and transformation, employment, poverty, inequality, household and community assets, health, education, social cohesion, safety and security, international relations and good governance. South Africa shares with other emerging economies to have

Figure 24: National strategy for sustainable development in South Africa.



Source: Stats SA, 2013

both characteristics of developing and developed economies. For instance, the per capita carbon emissions are among the highest in the World as a result of the intensive use of coal for electricity generation. The action plan formulated in the NSSD 1 states five priorities as outlined in ***Table 14***.

Table 14: Headline indicators from the NSSD 1.

Enhancing systems for integrated planning and implementation	• *Establish an effective National Committee on Sustainable Development (NCSD) [established by March 2012]* • *Number of government entities and private sector companies that report against sustainability indicators [King III sustainability reporting, Carbon Disclosure Project and Water Disclosure Project]* • *Number of community-based capacity building projects [begin measuring]*
Sustaining our ecosystems and using natural resources efficiently	• *Curtail water losses at water distribution systems to an average percentage reduction (saving) [from 30 to 15% by 2014]* • *Reduction (saving) of demand as determined in the reconciliation strategies for seven large water supply systems by 15% [assessment of water requirements and water monitoring systems implemented by 2014]* • *Increase the number of Blue Flag beaches [to above 29 beaches]* • *Rehabilitation of land affected by degradation [3.2 million ha by 2014]* • *Percentage of coastline with partial protection [from 12 to 14% by 2014]* • *Percentage of land mass protected (formal and informal) [from 6.1 to 9% by 2014]*

Towards a green economy	• *Progress on the implementation of the nine green economy programmes [impact on social (jobs), economic (industry development) and environmental (ecosystem) benefits by 2014]* • *Increase percentage (or amount) of financial resources ring-fenced/ streamlined and spent for green economy programmes* • *[2010/11 amount – Industrial Development Corporation: R11.7 billion, Development Bank of South Africa: R25 billion, Private: >R100 billion, National Treasury: R800 million]* • *Number of patents, prototypes, and technology demonstrators added to the intellectual property (IP) portfolio annually from funded or co-funded research programmes (five additions to the IP portfolio – patents, patent applications, licences and trademarks – by March 2014)* • *Share of GDP of the Environmental Goods and Services (EGS) Sector [3% of GDP by 2014]*
Building sustainable communities	• *Percentage of households with access to water (92 to 100%), sanitation (69 to 100%), refuse removal (64 to 75%) and electricity (81 to 92%) [by 2014]* • *Upgrading of 400 000 households in well-located informal settlements with access to basic services and secure tenure (approximately 2 700 informal settlements are in good locations, i.e. located close to metropolitan areas and basic services, have high densities and, in 2008, housed approximately 1.2 million households)* • *Increase in the South African Human Development Index (HDI) [2010 HDI: 0.597]* • *Gini coefficient (reduce income inequality) [2008: 0.66]*
Responding effectively to climate change	• *Greenhouse gas emissions (metric ton CO2 equivalent) [34% reduction below a business-as-usual baseline by 2020 and 42% by 2025]* • *Percentage of power generation that is renewable [10 000 GWh by 2014]* • *Climate change adaptation plans developed [12 sectors by 2012 (Biodiversity, Forestry, Water, Coastal Management, Agriculture,* • *Health, Tourism, Land and Rural Development, Local Government, Fisheries, Human Settlements, Business/Insurance)]*

Source: DEA, 2011

7.2 Legal Factors

7.2.1 Legal Framework

South Africa has a 'hybrid' legal system, formed by the interweaving of a number of distinct legal traditions: a civil law system inherited from the Dutch, a common law system inherited from the British, and a customary law system inherited from indigenous Africans (of which there are many variations depending on the tribal origin). These traditions have a complex interrelationship, with the English influence most apparent in procedural aspects of the legal system and methods of adjudication, and the Roman-Dutch influence most visible in its substantive private law. As a general rule, South Africa follows English law in both criminal and civil procedure, company law, constitutional law and the law of evidence; while Roman-Dutch common law is followed in the South African contract law, law of delict (tort), law of persons, law of things, family law, etc. (Du Bois, 2007); https://en.wikipedia.org/wiki/Law_of_South_Africa). The 'Constitution of South Africa' comprises the supreme law of the country of South Africa. It provides the legal foundation for the existence of the republic, sets out the rights and duties of its citizens, and defines the structure of the government. The current constitution, the country's fifth, was drawn up by the Parliament elected in

1994 in the first non-racial elections. It was promulgated by President Nelson Mandela on 10 December 1996 and came into effect on 4 February 1997[3], replacing the Interim Constitution of 1993.

With regards to the mining industry, in the past, the legal framework was favourable for large mining companies and encouraged monopolisation of the industry by a few large companies. Since 1994 attempts have been made to tackle transformation issues by addressing the imbalances of the past in this industry. Mineral rights were reverted to the State and exploration and mining licenses allowed new entrants into the market. To ensure the future success of the mining industry in South Africa, stability of the legislative environment is deemed important.

7.2.2 Resources Ownership & Property Rights Law

In the past, mineral and petroleum resources were privately owned, meaning that payment for the extraction of these resources was payable to the State only under certain circumstances, e.g. where mining had been conducted on State-owned land. To bring South Africa in line with prevailing international norms, the Department of Minerals and Energy promulgated the Mineral and Petroleum Resources Development Act, 2002 (MPRDA[4]) in terms of which these resources are recognised as belonging to the nation and the State as the custodian. In terms of section 3(2)(b) of the MPRDA (as amended) the Minister of Minerals and Energy may prescribe and levy any fees payable to the State for these resources in consultation with the Minister of Finance, who, in terms of section 3(4) must determine and levy the State royalty by means of an Act of Parliament. Therefore, the South African Royalty Service (SARS[5]) collects the royalties for these resources in terms of the Mineral and Petroleum Resources Royalty Act, 2008[6] and the Mineral and Petroleum Resources Royalty (Administration) Act, 2008[7].

Just as is the case for all other duties, levies, fees or money collected by SARS, the royalties collected on mineral and petroleum resources are paid into the State's Revenue Fund and then used in the allocation of funds for different purposes by the National Treasury on an annual basis. It is also worth mentioning the Mining Charter (broad-based socio economic empowerment Charter for the South African mining and minerals industry), which demands 26% black ownership of companies, and has become quite controversial as it is seen by some as a barrier towards investments.

The royalty rate is a variable one based on profitability and calculated according to a formula which takes account of earnings before interest on loans and taxes (a measure of companies' operational profits[8]. Two different formulae are applied for unrefined (i.e., raw) and refined (i.e., processed) minerals. The minimum royalty rate is 0.5% while the maximum royalty rates will be 7% for unrefined minerals and 5% for refined minerals. In determining the royalties, mining companies have the option of obtaining fiscal stability for the term of the mining agreement. In this case 'legislative amendments will have no force and effect', and companies will be entitled to compensation in the event of the state breaching the agreement.

A new property law that bans foreigners from owning land in South Africa is currently (2015) under discussion. If it comes into force (and it may be enacted on current foreign land-owners, which own around 7% of the land), it may have significant repercussions on foreign investments.

Considering the mining industry, in the past and at present the regulatory framework was and it remains favourable for big mining companies and presently it is found not to be sufficiently transparent. At present the MPRDA adds additional challenges for smaller to medium size enterprises to enter the commodity depressed market. The MPRDA is being revised, with concern about discretionary powers given to the minister regarding pricing of minerals, issuing of mining and ex-

3 www.constitutionalcourt.org.za/site/theconstitution/thecertificationprocess.htm
4 www.dmr.gov.za/publications/finish/109-mineral-and-petroleum-resources-development-act-2002/225-mineraland-petroleum-resources-development-actmprda/0.html
5 www.sars.gov.za
6 www.gov.za/sites/www.gov.za/files/31635_1260.pdf
7 www.gov.za/sites/www.gov.za/files/31642_1273.pdf
8 www.sars.gov.za/TaxTypes/MPRR/Pages/default.aspx

ploration licenses, etc. With regards to the permitting procedures, it is widely believed that, if the permitting process works, it is an enabler to mining success. In South Africa past and present – permitting takes on average 12 months for exploration licenses, if the required documentation (work plans, budgets, scope, EIA's etc.) is in order and does not require multiple revisions. Conversion between the exploration and mining permit is straightforward and provides security of tenure.

In the past the access to minerals was bound to ownership of land. Since 1994 attempts have been made to address transformation issues by addressing the imbalances of the past in this industry. Mineral rights were reverted to the State and exploration and mining licenses allowed new entrants into the market.

7.2.3 Business legislation

The Companies Act of 2008[9] provides for the incorporation, registration, organisation and management of companies, the capitalisation of profit companies, and the registration of offices of foreign companies carrying on business within the country. It

- defines the relationships between companies and their respective shareholders or members and directors;
- provides for equitable and efficient amalgamations, mergers and takeovers of companies;
- provides for efficient rescue of financially distressed companies;
- provides appropriate legal redress for investors and third parties with respect to companies;
- establishes a Companies and Intellectual Property Commission and a Takeover Regulation Panel to administer the requirements of the Act with respect to companies
- establishes a Companies Tribunal to facilitate alternative dispute resolution and to review decisions of the Commission; and
- establishes a Financial Reporting Standards Council to advise on requirements for financial record-keeping and reporting by companies.

7.2.4 Employment, Labour laws & Unions

The South African Constitution of 1997 provides the framework for employment-related matters[10]. Chapter 2 contains several provisions of relevance to employment and labour law, such as the right to equality, the protection of dignity, the protection against servitude, forced labour and discrimination, the right to pursue a livelihood, and protection for children against exploitative labour practices and work that is hazardous to their well-being. Section 23 of the Constitution deals specifically with labour relations, providing that everyone has the right to fair labour practices and specifically the right to form and join a trade union, to participate in the activities and programmes of a trade union, and to strike. Every employer, meanwhile, has the right to form and join an employers' organisation and to participate in the activities and programmes of an employers' organisation. Every trade union and every employer's organisation have the right to determine its own administration, programmes and activities, to organise, and to form and join a federation.

Since the early 1990s a set of laws regulating a wide range of employment aspects has been developed and continuous to be further developed. The top-level law is the Basic Conditions of Employment Act of 1997[11], which has been amended several times. The South African Department of Labour[12] is the responsible government department and provides all relevant information including overviews of the relevant legislation. Disputes are dealt with by the Commission for Conciliation, Mediation and Arbitration (CCMA[13]).

Workplace health and safety are covered by the Occupational Health and Sa-

9 www.gov.za/sites/www.gov.za/files/32121_421_0.pdf

10 www.constitutionalcourt.org.za/site/theconstitution/thecertificationprocess.htm

11 www.labour.gov.za/DOL/downloads/legislation/acts/basic-conditions-of-employment/Act%20-%20Basic%20Conditions%20of%20Employment.pdf

12 www.labour.gov.za

13 www.ccma.org.za

fety Act of 1993[14].

There are four prominent trade union federations with affiliates operating in the different sectors of the economy. These are the Congress of South African Trade Unions (COSATU[15]), the Federation of Unions of South Africa (FEDUSA, www.fedusa.org.za), the National Council of Trade Unions (NACTU[16]), and the Confederation of South African Workers' Unions (CONSAWU[17]). Together, these bodies claim to represent around 3 million workers, which is around 14% of the total workforce. The majority of trade unions, owing to their history in the struggle against apartheid, did and do have a strong political dimension. This is also reflected in the 'Tripartite Alliance' between COSATU, the ruling African National Congress (ANC), and the South African Communist Party (SACP). Closed shop agreements are permissible according to the South African labour laws.

Violent strikes, such as the 2014 platinum miners' strike and the so-called 'Marikana massacre' of 2012 also at a platinum mine, continue to plague the South African industry. In July 2013 mining companies, trade unions and government departments met to sign the Framework Agreement for a Sustainable Mining Industry, which is aimed at resolving problems in the industry, rooting out unrest and restoring investor confidence in the sector (GCIS, 2015).

7.2.5 Environmental regulations & their enforcement

The Department of Environmental Affairs (DEA)[18] oversees the implementation of environmental regulations in South Africa. A comprehensive list of applicable laws and regulations can be found on the Department's Web-site: www.environment.gov.za/legislation/actsregulations. This legislation stands before the backdrop of Section 24 of the South African Constitution that explicitly grants environmental rights to 'everyone'. Environmental regulations may be found at levels of government, national, provincial, and municipal.

National Environmental Management Act (NEMA[19]) and its amendments provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state.

The DEA operates a network at environmental compliance and enforcement officials from national, provincial and municipal government level. The DEA also compiles an annual National Environmental Compliance & Enforcement Report[20]. The number of inspectors was steadily increased and reached close to 2000 in 2014. The 2013/14 financial year continued to display a similar pattern to previous years in relation to the most prevalent types of environmental crimes being detected. The unlawful commencement of environmental impact assessment listed activities continued to be the most common non-compliance, while illegal hunting continued to be the predominant environmental crime. Understaffing and lack of resources was quoted as being a major problem in enforcement during the interviews held by the EO-Miners project in the Mpumalanga Province (Wittmer et al., 2013).

14 www.labour.gov.za/DOL/downloads/legislation/acts/occupational-health-and-safety/amendments/Amended%20Act%20-20Occupational%20Health%20and%20Safety.pdf
15 www.cosatu.org.za
16 www.nactu.org.za
17 http://consawu.co.za
18 www.environment.gov.za
19 www.environment.co.za/documents/legislation/NEMA-National-Environmental-Management-Act-107-1998-G-19519.pdf
20 www.environment.gov.za/sites/default/files/docs/nationalenvironmental_complianceandenforcement_report2013_14.pdf

8. Technological factors

8.1 Research and Development (scientific infrastructure)

8.1.1 Knowledge and resource base

The Department of Science and Technology (DST[1]) in South Africa is responsible for scientific research in the country and oversees the management of the country's relatively well-developed science system. DST seeks to realise the full potential of science and technology in social and economic development, through the development of human resources, research and innovation. Recently a strategic plan for the fiscal years 2015-2020 was presented (DST, 2015). It aims to support the fourteen objectives of the National Development Plan: (1) improved quality of basic education; (2) a long and healthy life for all South Africans; (3) all people in South Africa are safe and feel safe; (4) decent employment through inclusive economic growth; (5) a skilled and capable workforce to support an inclusive growth path; (6) an efficient, competitive and responsive economic infrastructure network; (7) vibrant, equitable and sustainable rural communities with food security for all; (8) sustainable human settlements and improved quality of household life; (9) a responsive, accountable, effective and efficient local government system; (10) environmental assets and natural resources that are well protected and continually enhanced; (11) create a better South Africa and contribute to a better and safer Africa and World; (12) an efficient, effective and development-oriented public service and an empowered, fair and inclusive citizenship; (13) an inclusive and responsive social protection system; and (14) transforming society and uniting the country.

The DST promotes South African science and innovation by developing science, technology and innovation policies, funding Research and Development (R&D) at public research institutes and universities and establishing new institutions and instruments aimed at enhancing the impact of science society. The Department also partners with other government department in particular those having oversight responsibilities over science performing agencies. Other public entities that funds relevant research and development are listed in ***Table 15*** (DST, 2015).

The National Mineral Research Council (Mintek) and the Council for Geoscience are relevant institutions providing support to the mining sector. Mintek is one of the world's leading technology organisations specialising in mineral processing, extractive metallurgy and related areas. Working closely with industry and other

1 http://www.dst.gov.za

Table 15: Public entities involved in research and development.

Entity	*Mandate*	*Outputs*	*Annual budget (2015/16) ZAR´000*
Council for Scientific and Industrial Research (CSIR)	*Foster industrial and scientific development in the national interest and in fields which it believes should receive preference, either by itself or in cooperation with the public or private sector, to contribute to the improvement of South Africans' quality of life. It also performs any other functions that may be assigned to it by the Scientific Research Council Act (1945)*	• *Peer-reviewed publications* • *Research technologies* • *Patents* • *Research reports*	*1,150,775*

Human Sciences Research Council	*Initiate, undertake and foster strategic basic and applied research in the human sciences*	*• Public dialogue and publications (dissemination of knowledge)* *• Research and analysis of developmental problems* *• Promote African research agenda and collaborative research* *• Research capacity for human sciences* *• Policy briefs (inform formulation of government policy and evaluate its implementation)*	*288,706*
National Research Foundation	*Support and promote research through funding, human resource development and the provision of research facilities to facilitate the creation of knowledge, innovation and development in all fields of S&T, including indigenous knowledge*	*• Provision of research infrastructure and funding (research funding [bursaries], research infrastructure grants, infrastructure investment funding)* *• National Research Facilities (students supported by National Research Facilities, ISI publications from National Research Facilities).*	*2,850,216*
Technology Innovation Agency	*Support the state in stimulating and intensifying technological innovation to improve economic growth and the quality of life of all South Africans*	*• Technology development funding (technology-based companies, jobs created by companies established through TIA funding)* *• Enabling environment for technology innovation (jobs created, increased companies turnover, technology support funding for SMEs)*	*385,188*

National Advisory Council on Innovation	*Advise the Minister of Science and Technology and government on the role and contribution of innovation in promoting and achieving national objectives*	*• A high-level document providing a framework for a decadal plan* *• Feedback report on the White Paper on Science and Technology and associated policies review process* *• A model for a data innovation portal* *• Rapid policy advice on pertinent innovation topics*	-
Academy of Science of South Africa	*• Promote common ground in scientific thinking across all disciplines, including the physical, mathematical and life sciences, as well as the human, social and economic sciences* *• Encourage and promote innovative and independent scientific thinking* *• Promote the optimum intellectual development of all our people* *• Provide effective advice and facilitate appropriate action in relation to the collective needs, opportunities and challenges of all South Africans* *• Link South Africa with scientific communities of the highest levels, within the SADC, the rest of Africa and the world*	*• Collaborations among global science organisations* *• Promotion of young scientists and women for science activities* *• STI policy advice for government* *• Scientific writing for publishing of research*	*22,991*
South African National Space Agency	*• Promote the peaceful use of space* *• Support the creation of an environment conducive to industrial development in space technology* *• Foster research in space S&T, communications, navigation and space physics* *• Advance scientific, engineering and technological competence through HCD outreach programmes and infrastructure development* *• Foster international cooperation in space-related activities*	*• Provision of space services and products* *• Increasing national space research output (sourced researching, publications, student funding)* *• Develop national human capacity and transformation (student and interns funding, young people engaged in space science activities)* *• Competitiveness of South African space industry.*	*124,355*

Source: DST, 2015

research and development institutions, Mintek provides service test work, process development and optimisation, consulting and innovative products. About 35% of the annual budget is funded by the State Science Vote, with the balance provided by contract research and development, sales of products and services, technology licensing agreements, and joint-venture private-sector companies. Mintek has about 780 permanent staff members, more than half of whom are scientists, engineers and other technical research and development specialist. The Council for Geoscience (CGS) is one of the National Science Councils of South Africa and is the legal successor of the Geological Survey of South Africa. Its mandate is to develop and publish world-class geoscience knowledge products and to render geoscience-related services to the South African public and industry, the compilation of geoscientific data and information in the form of maps and publications in the public domain, the rendering of geoscience knowledge services to the State to enable informed and scientifically-based decisions regarding the use of the earth's surface and resources within the boundaries of South Africa, among others. The CSIR´s Centre for Mining Innovation (CMI) is specialized into the core business of underground mining, particularly focused on gold and platinum: breaking and moving rock (drill and blast) safely and efficiently, increasing the safety of operations for workers to a maximum. The AziSA system is a result of these intentions: it is a series of protocols that facilitate data acquisition and underground control designed to enable mining companies to have a dynamic, continuous risk assessment of potential dangers during mining operations. For example, it allows for early warning systems for potential rock-falls.

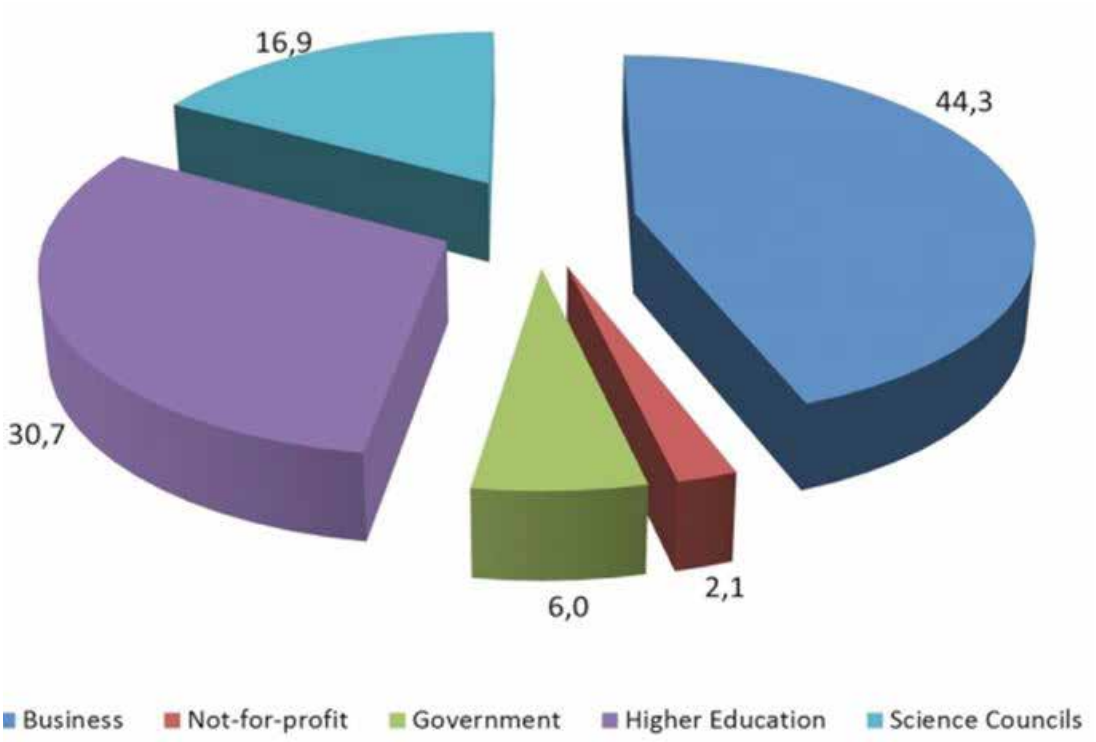
Besides public agencies, much R&D is conducted in South Africa in the mining field via private sector involvement. For instance South Africa's gold mining industry works at deeper levels and under more difficult conditions than any other mining industry in the world. Research is carried out by large industrial companies, being the most important ones: Anglo American Corporation of South Africa (applied metallurgy, processing of precious metals), De Beers Industrial Diamond Division (manufacturing and application of synthetic diamonds and other superhard material), Johannesburg Consolidated Investment Company (metallurgy, mineralogy, etc.), among others.

8.1.2 Research and Development culture

Since the end of WWII South Africa developed a strong university and research culture, which however, became ostracised during the later years of apartheid. The country's Medium Term Strategic Framework for 2014-2019 (MTSF, 2013) emphasises the need to build on the current range of strategies and programmes that are already supporting innovation in firms and research and development (R&D) in the private and public sectors, with emphasis on biotechnology and pharmaceuticals, space science and technology, energy security, and other needs presented by climate change. Research and technology development continues to be supported through tax incentives and partnerships between science councils and the business sector. Research and development is to be expanded to contribute towards building an inclusive society and to support a growing and competitive economy, as well as to provide equal opportunities to all South Africans to realize their full potential, in particular those previously disadvantaged by apartheid policies.

The MTSF (2013) observes that South Africa needs engineering skills to deliver an expanding infrastructure investment programme and to lead advances in mining, industry and logistics. The need to expand the pool of researchers and to increase their productivity is noted. Innovators will play a critical role in creating new products and new ways of producing existing products cheaply and more efficiently, including the delivery of public services. The MTSF (2013) also calls for research institutions and the national science and innovation system to be better coordinated and more collaborative. In order to achieve these targets, decision-making and governance needs to

Figure 25: R&D expenditure by sector of performance, 2012/13.



Source: HSRC, 2014

improve, and research and information management capacity harnessed to identify, develop and maintain datasets to generate policy-relevant statistics, indicators and indices.

In this regard, the DST's strategic plan for 2015-2020 (DST, 2015) is crucial on the transformation of the South African economy into a knowledge-based one, in which the production and dissemination of knowledge will lead to economic benefits and enrich all fields of human endeavour. In 2012/13 the Gross Expenditure on Research and Development (GERD) was 0.76% of the Gross Domestic Product (GDP), considerably below that of other emerging economies (HSRC, 2014). Nearly half of the expenditure comes from the private sector (***Figure 25***).

8.2 Patents, products, technologies generated

Compared to other BRICS (Brazil, Russian Federation, India, China, South Africa) countries, South Africa has the highest percentage of co-inventions registered with Europe (47%) followed by Brazil (43%). Against this, the percentage of co-inventions with Europe is considerably less important for China and India where the co-inventions with the United States represent 48% and 63% of total co-inventions with partners located abroad.

The openness of the South African science and technology system is also demonstrated by the increasing percentage of co-publications with international co-authorship, especially with Europe. Co-publications produced only with national co-authorship dropped from 87% in 1987 to 45% in 2008. At the same time, co-publications with Europe increased from 5% to 30% of articles with co-authorship and co-publications with other countries passed from 8% to 25%. In addition, 11% of South African applications filed under the Patent Cooperation Treaty (PCT) involved international co-invention. This percentage is above the OECD average (7.7%) and it is still over the EU27 (11%) and USA (11%) percentage of PCT applications with co-inventions (Karniouras, 2012). As an interesting indicator, it was established by the OECD that among the South African patent applications filed under the Patent Co-operation Treaty (PCT) that involved international co-invention (PCT patent applications with co-inventors lo-

cated abroad), Europe represented the most important partner in co-inventions among the three major regions (USA, Europe, Japan) with 5.2% in comparison with the United States (3.2%) and Japan (0.07%).

8.3 Telecommunications & E-commerce

The South African government continues to emphasise the importance of information and communication technologies (ICTs) and their contribution to the country's economic growth, specifically in the broad framework for economic policy as set out in the Accelerated and Shared Growth Initiative of South Africa (ASGISA) (Esselaar et al., 2010). In the current version, the action plan includes the goal to bring down the cost of ICT by developing high-speed national and international broadband capacity. However, South Africa continues, despite the overall growth of the ICT sector, to lag behind in international comparisons, and while the setbacks are not significant in size, they certainly indicate an inability by the country to harness the potential of ICTs for economic growth and development as articulated in various national policies and strategies.

The rank of South Africa from 25th to 126th (out of 144 countries) in a number of telecommunication aspects as given in ***Table 16*** (World Economic Forum, 2014). The table shows that although South Africa ranks fairly high on the number of mobile telephone subscriptions, indicating a strong connectivity regime, while internet subscription and usage are at fairly low levels.

Table 16: Global rank for South Africa in selected telecommunication fields.

Parameter	*Rank*
Mobile telephone subscription	*25*
Fixed telephone lines	*90*
Individuals using internet %	*69*
Internet Bandwidth kb/s per user	*126*
Parameter	*Rank*
Mobile telephone subscription	*25*
Fixed telephone lines	*90*
Individuals using internet %	*69*
Internet Bandwidth kb/s per user	*126*

Source: World Economic Forum, 2014

9. Conclusions

9.1 Overview of economic development – history and drivers

The modern history of South Africa is marked by two major inflection points, namely the Cape Colony coming under British Rule in 1806 and the transition from apartheid in 1994. While the antagonism between whites of Dutch and British descent that culminated in the Anglo-Boer Wars in the early 20th century has to a certain extent been overcome (although still occurring in some areas), the country is still in the post-apartheid evolutionary phase that entailed (and required) radical socio-economic and governance paradigm shifts. Much of the government´s efforts are directed towards achieving equality between whites and the rest of the population and this can be seen in the programmes of every ministry. Education at all levels and in particular addressing the non-white communities is a key priority, also with a view to reduce unemployment and alleviate poverty. HIV/AIDS is a major socio-economic challenge to the country with nearly 13% of the population affected, despite some improvements in this regard.

In spite of the significant social problems, South Africa remains one of the most stable countries on the African continent with indices indicating a favourable business and investment environment. Metal mining, in particular for gold and platinum, remains a crucial industry for foreign exchange earnings, although mining accounts for only about 10% of overall GDP.

An important challenge for the future will be the de-carbonisation of the industry and the energy supply; South Africa is one of the countries with the highest CO_2 footprint per capita, due to the predominance of coal in power-generation and carbon-intensive industries such as iron-ore smelting and steel production. Another interesting point about South Africa is (as for other BRIC countries) that it shares many characteristics with developed as well as less-developed countries. South Africa has world-class science, engineering and industry capabilities alongside the problems of developing countries. South Africa has the potential to join the rank with industrialised countries, but growing social unrest may jeopardise this future. In recent years the down-turn in the economy since 2008 affected significantly the outlook and budget balance in the RSA, though there are signs of a recent recovery.

9.2 Conclusions specific to the non-energy raw materials sector

9.2.1 Industry and trade

South Africa´s mining industry has successfully developed as a commodity export-led one, i.e. valued-added has been very limited in the country, and it has developed based on an exceptional mineral resources endowment. The country has profited from substantial reserves of gold, platinum group metals, diamonds, coal, ferrochrome and base metals. Additionally it has some of the largest deposits in the world of platinum and gold. It also produces some of the highest quality diamonds and with gold it has some of the most continuous and largest orebodies. Gold, platinum group metals, coal and iron ore mining sectors remains crucial in terms of foreign exchange earnings of the economy. While the manufacturing sector has come to generate greater export sales than mining during the course of the 1990's, as a net exporter the mining sector remains the single most important earner of foreign exchange for the economy. Owing to wage increases, the mining sector has become less profitable in recent years.

The mining industry managed to develop based on a legal framework favourable to big mining companies and a monopolised structured. This has been attempted to be changed after 1994 (post-apartheid era) by reverting mineral rights to the State, allowing new entrants into the market by new exploration and mining licences. A stable fiscal framework,

with no significant post-apartheid changes, has been instrumental in enabling the success of the mining industry. A key feature has been the allowance of the repatriation of profits for all industries. Also permitting times in South Africa have acted as an incentive, i.e. permitting takes on average currently 12 months for exploration licenses, and the conversion between the exploration and the mining permit is straightforward, providing security of tenure.

The stability of the legislative environment is important to ensure the future success of mining in South Africa,. Apart from the legislative environment, access to land, mining permits and access to energy and water will also play an important role for this sector. In the past there was sufficient supply of water and energy. At present, with increased population numbers and as a result of urbanisation the supply of energy and water are constrained due to increased demand. This challenge is recognised by the South African government, and efforts are being made to increase the energy output. For future success in mining, efficient mining methods that use water and energy sparingly are critical.

While looking at the financial aspect for development of the mining sector, post-1994 companies were able to invest globally and spread risks and so doing became global mining companies. Acquisitions and mergers took place, head offices moved offshore, and mining companies were able to list on international stock exchanges. Also since the mining sector still remains a labour sensitive job, post-1994 there has been strong wage pressure and a decline in the mining workforce. This trend is likely to continue in the future, with an increased drive for modernisation and mechanisation. Labour cost is currently high and labour is unreliable due to continued strikes. Also, since 1994 there has been strong wage pressure and a decline in mining workforce, which is currently seen as a challenge. Another challenge lies in the perspectives of resource nationalism and in increasing the added-value of extracted minerals, an issue that is in the political agenda and will remain an important topic.

A more complete and detailed analysis of this issue will be found in the Transactional Analysis Report produced in WP1.4 (D 1.5 *Report on transactional analysis of Industry and Trade*).

9.2.2 Education and outreach

South Africa has been facing for years a skills shortage in the non-energy minerals sector. In the past the country had very skilled engineers (specialised in shaft sinking, ventilation, rock engineering, etc.) that made deep level mining possible, but the industry is labour intensive and reliant on low cost labour. After 1994 many skilled workers have moved abroad, partly due to the global skills shortage and better working opportunities in other mining countries. Besides, there has been a gradual transition to more mechanised operations, and in the future it is believed that there will be a continued drive for modernisation and mechanisation and thus an increased demand for a skilled workforce.

A more complete and detailed analysis of this issue will be found in the Transactional Analysis Report produced in WP1.3 (D 1.4 *Report on transactional analysis of Education and Outreach*).

9.2.3 Research and innovation

Raw materials-related R&I is conducted in South Africa by public and private partners. Among the first, the National Mineral Research Council (Mintek) and the Council for Geoscience are relevant institutions providing support to the mining sector. Mintek is one of the world's leading technology organisations specialised in mineral processing, extractive metallurgy and related areas. The Council for Geoscience (CGS) is one of the National Science Councils of South Africa and is the legal successor of the Geological Survey of South Africa. Its mandate is to develop and publish world-class geoscience knowledge products and to render geoscience-related services to the South African public and industry, the compilation of geoscientific data and information in the form of maps and publications in the public domain, the rendering of geoscience knowledge services to the State to enable informed

and scientifically-based decisions regarding the use of the earth's surface and resources within the boundaries of South Africa, among others. The CSIR´s Centre for Mining Innovation (CMI) is specialized into the core business of underground mining, particularly focused on gold and platinum: breaking and moving rock (drill and blast) safely and efficiently, and in increasing the safety of operations for workers to a maximum.

Besides public agencies, much R&D is conducted in South Africa in the mining field via private sector involvement. For instance South Africa's gold mining industry works at deeper levels and under more difficult conditions than any other mining industry in the world. Research is carried out by large industrial companies, being the most important ones: Anglo American Corporation of South Africa (applied metallurgy, processing of precious metals), De Beers Industrial Diamond Division (manufacturing and application of synthetic diamonds and other superhard material), Johannesburg Consolidated Investment Company (metallurgy, mineralogy, etc.), among others.

A more complete and detailed analysis of this issue will be found in the Transactional Analysis Report produced in WP1.2 (D 1.3 *Report on transactional analysis of Research and Innovation*).

Appendix SA1: Multi-factor matrix and radar charts

The multi-factor matrix

The information in the preceding sections of this report is summarised in a multi-factor matrix which is presented in Appendix SA2. In each Country Report, the findings of the research (presented in Chapters 4 to 8 inclusive) have been used to develop a "multi-factor matrix". The matrix for each Reference Country aims to both summarise the findings of the research and to represent the relative importance of each factor to the economic development of each country.

The weightings ascribed to factors in the matrices (and the 'radar charts' to which they give rise) are included for completeness in this report; this organisation of information and preliminary analysis of findings provides the basis for ongoing discussion within the WP1 team and between the WP1 team and the expert panels.

Each matrix has 6 columns as indicated below.

Category I Code I Subcategory I Weight I Justification of judgement I Source

Five main categories of factors have been considered (column 1), reflecting the main chapter headings in each of the country reports (see above).

These are further divided into subcategories, consistent with the sub-sections of each chapter (one for each of the 49 explanatory factors), and the codes ascribed to the sub-categories are the sub-section numbers (columns 2 and 3). The importance of each subcategory has been ascribed a numerical weight in column 4, using the following scale:

Table 17: Numerical weights for fulfilling the multi-factor matrix

Weight	Level of importance
5	Very high importance
4	High importance
3	Medium importance
2	Low importance
1	Very low importance

The assignment of weights for the multi-factor matrices has been a collaborative effort between WP 1 partners with input from the country experts. A short justification for the ascribed weighting is given in column 5 and the source(s) of information are given in column 6.

Sub-totals are given for the weighting scores at the end of the matrix section for each main category and, at the end of the matrix, an average score is created for each main category by dividing the sum of the weighting scores by the number of factors (subcategories) considered.

Radar charts

The information and weighting scores assigned in the matrix have been summarised via 5- and 12- axis "radar charts" (***Figure 26*** and ***Figure 27***). The five axis charts depict the relative importance of the five main categories of factors considered, by plotting the average weighting score on the relevant axis. To further emphasise the relative importance of the primary factors, the sizes of the points on the radar chart are proportional to the average scores.

To provide more detailed insight into the relative importance of factors in the multi-factor matrices, a more 'granular' radar chart has been produced for each country, with 12 axes, each representing one (or a group) of the subcategories in the matrix. The 12 factors selected are as follows (numbers in brackets are the codes (and subsection numbers) relating to the 12 factors chosen):

Geo-environmental Factors (Chapter 4)
1. Natural and mineral resources (4.2)

Socio-cultural Factors (Chapter 5)
2. Demographics and immigration (5.2.1)
3. Cultural norms and values (5.2.5)
4. Education system & infrastructure (average of 5.3.1 and 5.3.2)

Economic factors (Chapter 6)
5. Economic output (6.2.2)
6. Foreign investment (6.2.7)
7. Energy system and consumption (6.3.1)
8. Transport infrastructure (6.3.2)

Political and legal factors (Chapter 7)
9. Resources ownership & property rights law (7.2.2)
10. Trade and trade policies (average of 6.1.3 and 7.1.7)

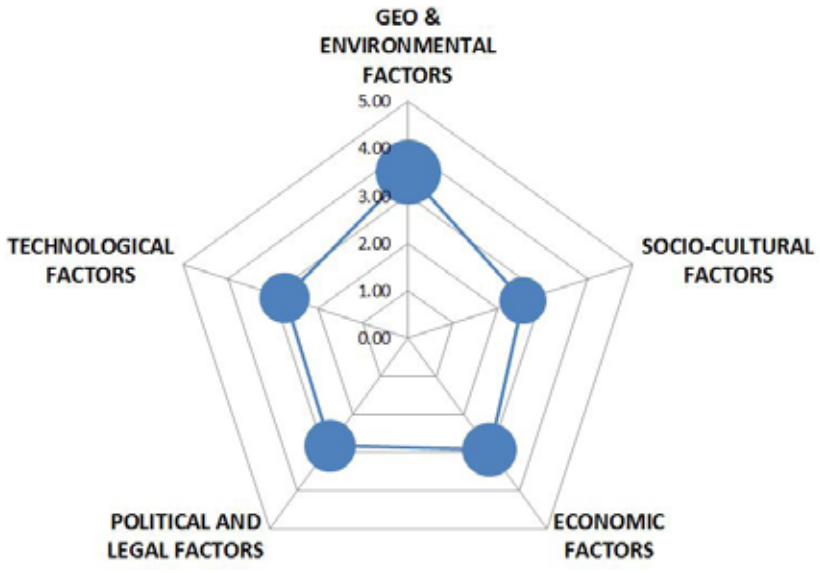
Technological factors (Chapter 8)
11. Knowledge and resource base and R&D culture (average of 8.1.1 and 8.1.2)
12. Patents, products and technology (8.2)

The choice of 12 factors and groups of factors from the 49 subcategories in the multi-factor matrix was subjective and the final selection was based on discussion within the WP1 team and with the country experts. These are intended to allow for more detailed characterisation of and comparison between the reference countries and, ultimately, with EU countries. They have been selected to be broadly consistent with key factors provided by the World Economic Forum in its Global Competitiveness Report, and to be equally relevant to explaining economic development in general and the raw materials sector in particular in all countries included in this project. Unlike the 5 axis chart, the plotted points on the 12 axis chart are all the same size.

5 axis radar chart for South Africa

The chart below shows the importance of the natural and mineral resource endowment in the economic development of South Africa. In a second place, the graph

Figure 26: Five axes radar chart for the RSA.

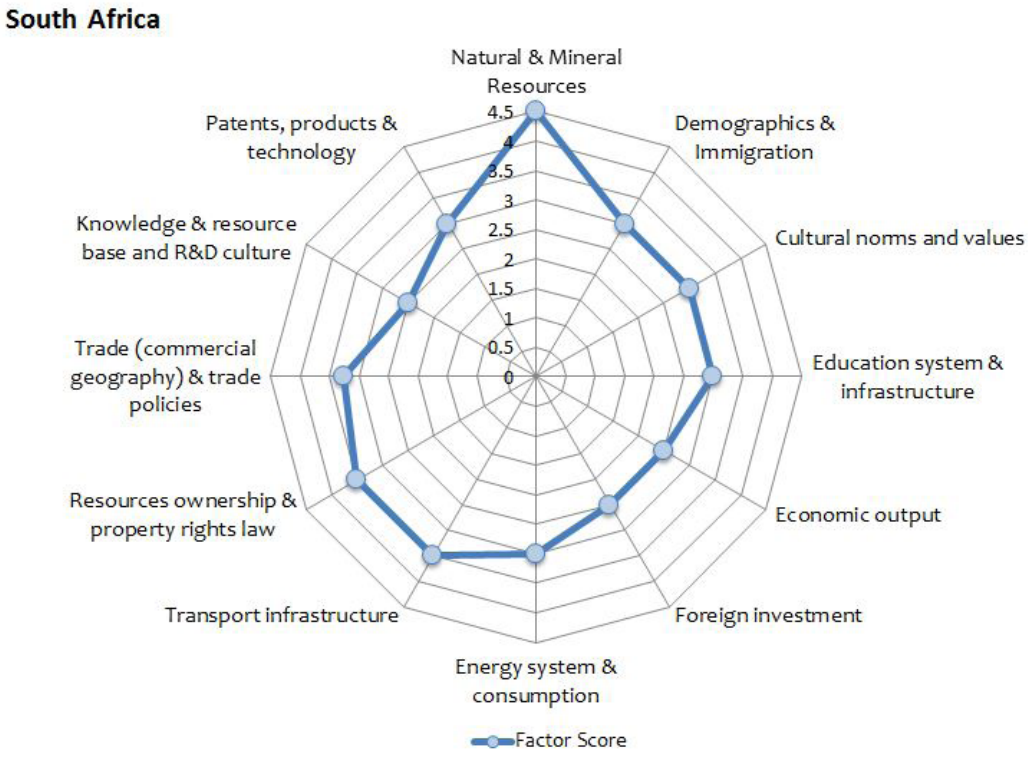


shows the importance of economic and political and legal factors.

12 axis radar chart for South Africa

The 12-axis radar chart also emphasizes the weight of the mineral resource endowment, of trade to export commodities and the necessary transport infrastructure.

Figure 27: Twelve axes radar chart for the RSA.



Appendix SA2: South Africa multi-factor matrix

Category	Code	Subcategory	Weight	Justification of judgement	Source
GEO & ENVIRONMENTAL FACTORS	4.1	Geographical Situation	3.5	SA's peripheral location and low-capacity on-land transport routes does it not make a hub for regional trade. Overseas trade through sea-ports at two oceans and ports of call en route between Asia and Europe remain important for the economy	http://www.sadc.int/
	4.2	Natural & Mineral resources	4.5	South Africa is one of the countries with the richest endowments of minerals. Mining industry continues to make a sizeable contribution to the SA economy, most notably in terms of foreign exchange earnings (50% in 2011).	Government Communication and Information System. Pocket Guide to South Africa 2015/16: Mineral Resources. p. 151-154, Pretoria, 2015.
	4.3	Water resources	4	SA's water resources are reaching the limit of exploitability, particularly in the industrialised areas. There are also quality issues in surface- and groundwaters, particularly in industrial and mining regions.	Department of Water Affairs, Groundwater Strategy 2010, 64 p., Pretoria, 2010; Wildlife and Environment Society of South Africa. South Africa's Water Resources: WESSA Position Statement. 5 p., Howick, 2012.
	4.4	Climate	4	The projected climate change will particularly affect water availability in already stressed regions, which affects agriculture, industrial production, and electricity generation. It will also increase the likelihood of extreme events in semi-arid areas of SA	Davis, C.L. [Ed.]. Climate Risk and Vulnerability. A Handbook for Southern Africa. Council for Scientific and Industrial Research. 92 p., Pretoria, 2011; Risk and Vulnerability Atlas (http://sarva.dirisa.org)
	4.5	Geological Factors	1.5	While the south-western Cape has one of the highest levels of seismicity in Africa, the absolute earthquake risk is low. Seismicity will not be a constraining factor.	Visser, P., Kijko, A. South Africa Spotlight on Earthquake. 4 p., Johannesburg, Aon Benfield, 2010. South African National Correspondent, IAVCEI Department of Geology Rhodes University Grahamstown 6140 South Africa
	4.6	Ecologically Sensitive Areas	3.5	Protection of the environment, including UNESCO Biosphere Reservations and RAMSAR wetlands, may become a major constraining factor to economic development	www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/africa/south_africa/).
Subtotal		All geo & environmental factors (6)	21		

Category	Code	Subcategory	Weight	Justification of judgement	Source
SOCIO-CULTURAL FACTORS	5.1	Historical Background	3	Historical processes, including apartheid, have been influential in accelerating or slowing down the development of South Africa, e.g. with regards to the development of the mining industry	-
	5.2.1	Demographics	3	SA's population is very young (30% below 15 years of age) and grows fast at around 1.5% p.a. The high unemployment rate among young adults has a significant economic impact. An additional impact is the high incidence (17%) of HIV/AIDS in the population.	Statistics South Africa, Mid-year population estimates 2015, Statistical release P0302, 18 p., Pretoria, 2015.
	5.2.2	Ethnic composition	2.5	Deep ethnic divisions in African society, indicated by high levels of ethnolinguistic and religious diversity and low levels of "social capital" has slowed economic growth	Geography, Demography, and Economic Growth in Africa, David E. Bloom and Jeffrey D. Sachs, Harvard Institute for International Development Harvard University
	5.2.3	Language	2	Despite the fact that English is recognised as the language of commerce and science, it ranked fourth in the list of 11 official languages, and was spoken by only 9.6% of South Africans as a first language in 2011. Poor knowledge of English is a significant constraint in educational achievement and in the labour market.	Statistics South Africa. Census 2011 Census in brief. Report No. 03-01-41, 102 p., Pretoria, 2012.
	5.2.4	Religion	1	The majority of the population (all ethnic groups) is affiliated to the Christian faith and religious issues do not dominate any economic agenda	Statistics South Africa, General household survey 2014, Statistical release P0318, 174 p., Pretoria, 2015.
	5.2.5	Cultural Norms, Values & Conflicts	3	The ethnic heterogeneity, associated SES and norm and value systems continue to dominate post-apartheid society. Resulting conflicts have the potential to weaken economic development.	www.everyculture.com/Sa-Th/South-Africa.html
	5.2.6	Civil society & environmental awareness	2.5	Struggles between different ethnic groups are likely to continue. The post-apartheid government has not been able to deliver its promises. There is a certain risk that the resulting unrest will disrupt the positive developments of recent years. Improvements of the socio-economic situation are not likely to have a significant impact on the overall level of environmental awareness. Mining related impacts may cause local opposition.	Anderson, B.A., Wentzel, M., Romani, J.H., Phillips, H., Exploring Environmental Consciousness in South Africa. Population Studies Center Research Report 10-709, 28 p., Ann Arbor, Mi., 2010; Graham, L., et al., Review of the State of Civil Society Organisations in South Africa, Report compiled for the National Development Agency. 62 p., Johannesburg, 2008; National Development Agency (NDA, www.nda.org.za).

Category	Code	Subcategory	Weight	Justification of judgement	Source
	5.3.1	Education system	3	The education system is not producing the skills needed in the labour market. Hence it has not been a source of economic development rather a source of economic stagnation	Murtin, F. Improving Education Quality in South Africa", OECD Economics Department Working Papers, No. 1056. 41 p., Paris, 2013; Department of Basic Education. Education Statistics in South Africa 2013. 60 p., Pretoria, 2015; Statistics South Africa, General household survey 2014, Statistical release P0318, 174 p., Pretoria, 2015.
	5.3.2	Education infrastructure	2.5	While the schooling rate is now almost universal, the quality of the infrastructure of schools shows significant differences. A large number of rural schools and those in predominantly black neighbourhoods are substandard. This will have a negative impact on the educational outcome and skill level, which in turn hampers economic development	www.equaleducation.org.za/page/school-infrastructure; Murtin, F. Improving Education Quality in South Africa", OECD Economics Department Working Papers, No. 1056. 41 p., Paris, 2013.
	5.4.1	Health system	3	Communicable diseases (incl. HIV/AIDS) and violence are the major causes of premature death in middle-age men and women. Life-expectancy has significantly declined. High cost of health-care and low outcomes continue to burden the economy	Bradshaw, D., Groenewald, P., Laubscher, R., Nannan, N., Nojilana, B., Norman, R., Pieterse, D., Schneider M. Initial Burden of Disease Estimates for South Africa, 2000. South African Medical Research Council, 84 p., Cape Town, 2003; Statistics South Africa, Financial statistics of higher education institutions 2013, Statistical release P9103.1, 18 p., Pretoria, 2014.
	5.4.2	Health infrastructure	2.5	South Africa has a tax funded public health system covering 85% of the population and a well-entrenched private health system covering the rest. The number of doctors and other health personnel is still insufficient. Although 13% of the state budget is spent the outcomes are inadequate, adversely affecting economic development.	www.oecd.org/els/health-systems/Briefing-Note-SOUTH-AFRICA-2014.pdf; www.sahivsoc.org/upload/documents/National_Strategic_Plan_2012.pdf
Subtotal		All socio-cultural factors (11)	28		

Category	Code	Subcategory	Weight	Justification of judgement	Source
ECONOMIC FACTORS	6.1.1	Economic structure	4	South Africa has an open economy, with trade activity making up a significant component of domestic economic activity. Mineral commodities make up a significant proportion of exports. Tariff liberalisation undertaken since the early 1990s has been a major contributor to South Africa's strong economic growth. Energy supply will be a major bottleneck in development	US Central Intelligence Agency. World Fact Book 2015. Washington, 2015; Vickers, B. South Africa's Trade Policy and Strategy Framework. Presentation to SA Parliamentary Monitoring Group
	6.1.2	Industrial Geography	3.5	SA industry is characterised in many areas by a deep value chain. Industrial production has a strong mining-related compound, but industry increasingly diversifies and the service and financial sector come to be dominant	Kumo, W.L., Rieländer, J., Omilola, B. South Africa 2014, African Economic Outlook. 13 p., AfDB/OECD/UNDP, 2014.
	6.1.3	Commercial Geography	3.5	Given the economically weak neighbouring countries and difficult transport connections, overseas exports and the domestic market are the most important ones for the economy	Southern Africa Development Community (SADC)
	6.1.4	Agricultural Geography	2.5	With less than 3% value added to the economy, the role of agricultural sector is slowly becoming less important to the overall economic development	Statistics South Africa, Gross domestic product. First quarter 2015, Statistical release P0441, 20 p., Pretoria, 2015.
	6.2.1	Economic diversity	2.5	In line with industrialised economies, SA grows into a more and more diversified economy. The raw materials sector provides just over 8% of the value added.	Statistics South Africa, Gross domestic product. First quarter 2015, Statistical release P0441, 20 p., Pretoria, 2015.
	6.2.2	Economic output	2.5	Economic output is an indicator of economic development rather than being a factor. South Africa's growth slowed from 3.5% in 2011 to 2.5% in 2012, reflecting primarily the sluggish external environment and domestic labour strife	South Africa Economic update, Focus on financial inclusion The International Bank for Reconstruction and Development/THE WORLD BANK
	6.2.3	Labour costs, mobility & employment	2.5	Lack of skilled labour, rising wages and increasing numbers of industrial actions have a slowing effect on economic development	Kumo, W.L., Rieländer, J., Omilola, B. South Africa 2014, African Economic Outlook. 13 p., AfDB/OECD/UNDP, 2014.
	6.2.4	Interest rates	3	Low interest rates favour industrial investment, but may reduce consumer disposable income.	Government Finance Statistics of South Africa: 1994–2012 Supplement to the South African Reserve Bank Quarterly Bulletin March 2013
	6.2.5	Inflation rates	2.5	Inflation is mainly linked to cost of imported energy carriers and wages rises. Both will influence production costs and competitiveness in domestic and international markets	South African Reserve Bank (SARB, www.resbank.co.za)

Category	Code	Subcategory	Weight	Justification of judgement	Source
	6.2.6	Customer liquidation and spending power	2.5	Following the crisis of 2008 and increasing interest rates consumer liquidity declined, but rose again in recent years. As in developed countries much of the wealth is tied-up in property and long-term investments. Given that many consumer goods are imported, consumer liquidity will influence mainly the foreign trade balance and less inland production.	Aron, J., Muellbauer, J., Prinsloo, J. Estimating Household-Sector Wealth in South Africa. South African Reserve Bank, Quarterly Bulletin June 2006, p. 61-72, Pretoria, 2006; Kuhn, K. Note on Household Wealth in South Africa. South African Reserve Bank, Quarterly Bulletin September 2010, p. 66-73, Pretoria, 2010.
	6.2.7	Foreign investment	2.5	South Africa is by far the largest recipient of foreign direct investment in Africa. SA ranks 13th out 25 countries '2014 FDI Confidence Index®'. Investors' confidence is slowly increasing.	Gelb, S., Black, A., Foreign Direct Investment in South Africa, In: Investment Strategies in Emerging Markets by K. E. Meyer and S. Estrin, Edward Elgar Publishing Ltd, 2004: 177-212; A.T. Kearney Inc., The 2014 A.T. Kearney Foreign Direct Investment Confidence Index. "Ready for Takeoff", 2014; World Bank, Doing Business 2015. Going Beyond Efficiency, World Bank Group Flagship Report, p., Washington, 2015.
	6.2.8	Public finance situation	3	South Africa's national government total gross loan debt relative to income was reduced over time, and consistently remained at levels regarded as prudent and sustainable. Hence it has been a source of economic strength for the country over time	Budget Review 2014 National Treasury Republic of South Africa
	6.3.1	Energy system, consumption & access	3	Energy system has supported the mining industry which is important for economic development of the country	Kumo, W.L., Rieländer, J., Omilola, B. South Africa 2014, African Economic Outlook. 13 p., AfDB/OECD/UNDP, 2014.
	6.3.2	Transport infrastructure	3.5	The transport infrastructure is well developed by African standards. The rail network continues to shrink. Only 20% of the roads are paved and the state of the network is highly variable. Transport capacities into neighbouring countries are limited. The country has a number of good ports. The degrading road network will hamper economic development.	The State of South Africa's Economic Infrastructure: Opportunities and challenges 2012 , Development Bank of Southern Africa Limited
Subtotal		All economic factors (14)	41		

Category	Code	Subcategory	Weight	Justification of judgement	Source
POLITICAL AND LEGAL FACTORS	7.1.1	Administrative structure	1	SA is divided into 9 provinces of variable economic state and efficiency in public spending.	-
	7.1.2	Governmental stability & transparency	3	Ratings below average for public trust in politicians and absence of favouritism indicate scope for improvement. Although a currently relatively stable situation since the end of apartheid, the leading role of the ANC becomes increasingly challenged.	Transparency International, Corroption Perception Index 2014, 12 p., Berlin, 2015; World Economic Forum, The Global Competitiveness Report 2014-15, 549 p., Geneva, 2015.
	7.1.3	Fiscal policies	3	Government increases the personal income tax and some consumption taxes slightly to make up for losses due to a slowing down economy.	National Treasury, Budget Review 2015. 51 p., Pretoria, 2015.
	7.1.4	Government spending priorities & allocation	3.5	The government is making significant efforts to improve the infrastructures in the country and to combat poverty. The public sector in consequence continues to increase. This will have a mixed effect on the economy, creating opportunities on one side, but also consuming significant amounts of private wealth.	National Treasury, Estimates of National Expenditure 2015 - Abridged version, 756 p., Pretoria, 2015; National Treasury, Budget Review 2015. 51 p., Pretoria, 2015.
	7.1.5	National Security	2.5	SA has in the past been involved in the civil wars of its neighbours, but with the conflicts being settled there are currently little threats to its borders. Nearly 13% of the state budget is spent on national security and internal safety, which burdens the economy	www.dod.mil.za;National Treasury, Budget Review 2015. 51 p., Pretoria, 2015.
	7.1.6	Safety & crime	2.5	SA remains a violent society with a 30-fold probability to be affected compared to industrial societies. Violence is unequally distributed among ethnic groups. Low safety levels require significant resources to achieve adequate protection of individuals and enterprises. To the contrary, organised crime is less of a problem.	www.saps.gov.za/resource_centre/publications/statistics/crimestats/2014/download/individual_crime_cat_2014.xls; World Economic Forum, The Global Competitiveness Report 2014-15, 549 p., Geneva, 2015.
	7.1.7	Trade policies	3	SA's tariffs have been continuously reduced over the last decade and are now just below 8% on average, with many goods and commodities rated at 0%. SA has concluded many free trade agreements around the world.	International Trade and Economic Development Division of the Department of Trade and Industry. A South African Trade Policy and Strategy Framework. 83 p., Pretoria, 2010.

Category	Code	Subcategory	Weight	Justification of judgement	Source
	7.1.8	Bilateral, Multilateral & International agreements	2.5	Post-apartheid SA became well-integrated into the international community and is member of most significant international organisations. SA is member of various global and regional trade agreements.	US Central Intelligence Agency. World Fact Book 2015. Washington, 2015; International Trade and Economic Development Division of the Department of Trade and Industry. A South African Trade Policy and Strategy Framework. 83 p., Pretoria, 2010.
	7.1.9	Sustainable development policies	4	SA has developed a National Strategy for Sustainable Development. A major issue will be the large CO2 footprint due to the use of coal as major energy carrier and other carbon-intensive industries. De-carbonisation will be a major challenge.	Department of Environmental Affairs, National Strategy for Sustainable Development and Action Plan (NSSD 1) 2011–2014, 48 p., Pretoria, 2011.
	7.2.1	Legal Framework	2.5	SA has 'hybrid' English case law and Roman-Dutch civil law. Today the framework is provided by the Constitution of 2003 and it appears that the law system is reliable.	Du Bois, F. [Ed.]. Wille's Principles of South African Law, 9th ed. CLXXVII + 1269 p., Cape Town, Juta & Co, 2007.
	7.2.2	Resources Ownership & Property Rights Law	3.5	The Mineral and Petroleum Resources Development Act of 2002 effectively nationalised ownership of resources and royalties are payable for their exploitation. Royalties are moderate and take into account the financial situation of the company concerned.	www.dmr.gov.za/publications/finish/109-mineral-and-petroleum-resources-development-act-2002/225-mineraland-petroleum-resources-development-actmprda/0.html; www.sars.gov.za/TaxTypes/MPRR/Pages/default.aspx.
	7.2.3	Business legislation	2.5	The Companies Act of 2008 provides for the incorporation, registration, organisation and management of companies, the capitalisation of profit companies, and the registration of offices of foreign companies carrying on business within the country	www.gov.za/sites/www.gov.za/files/32121_421_0.pdf
	7.2.4	Employment, Labour laws & Unions	3.5	The constitution of 1997 provides the framework for all labour legislation with a wide range of 'acts' covering labour relations, workplace health & safety, etc. Unions are a strong political force but only represent around 20% of the workers. Violent labour disputes have recently severely some mining operations and had a significant impact on the economic development and security of investment.	www.labour.gov.za/DOL/downloads/legislation/acts/basic-conditions-of-employment/Act%20-%20Basic%20Conditions%20of%20Employment.pdf; Government Communication and Information System. Pocket Guide to South Africa 2015/16: Mineral Resources. p. 151-154, Pretoria, 2015.

Category	Code	Subcategory	Weight	Justification of judgement	Source
	7.2.5	Environmental regulations & enforcement	2.5	The National Environmental Management Act of 1998 provides the framework for national and provincial regulations. However, enforcement is weak in many areas due to lack of resources and understaffing.	www.environment.co.za/documents/legislation/NEMA-National-Environmental-Management-Act-107-1998-G-19519.pdf; www.environment.gov.za/sites/default/files/docs/nationalenvironmental_complianceandenforcement_report2013_14.pdf.
Subtotal		All political and legal factors (14)	39.5		
TECHNO-LOGICAL FACTORS	8.1.1	Knowledge and resource base	2.5	The Department of Science and Technology strategic plan for 2015-200 sets out the country's R&D objectives. The country has a well-developed science system, which since the end of apartheid has been reconnected to the world's developments. Strategic objectives now include social policy aspects as well.	Department of Science and Technology, Strategic Plan for the Fiscal Years 2015-2020. 64 p., Pretoria, 2015; Supporting the EU access to South Africa's research and innovation Programmes SAccess ACCESS4EU – South Africa (Contract Number 243851)
	8.1.2	R&D culture	2.5	South Africa has a strong R&D tradition, but the Gross Expenditure on Research and Development (GERD) of 0.8% is below that of other emerging economies. Much of the research is business-driven and the economic development potential has not yet been utilized in full.	Republic of South Africa, Medium-Term Strategic Framework 2014-2019, , Pretoria, 2013; Human Sciences Research Council. South African National Survey of Research and Experimental Development 2012/13.- Pretoria, 2014.
	8.2	Patents, products, technologies generated	3	Compared to the BRIC (Brazil, Russian Federation, India, China), South Africa has the highest percentage of co-inventions registered with Europe (47%) followed by Brazil (43%)	Supporting the EU access to South Africa's research and innovation Programmes SAccess ACCESS4EU – South Africa (Contract Number 243851)

Category	Code	Subcategory	Weight	Justification of judgement	Source
	8.3	Telecommunications & E-commerce	3	The South African government continues to emphasize the importance of ICTs and their contribution to the country's economic growth, specifically in the broad framework for economic policy as set out in the Accelerated and Shared Growth Initiative of South Africa (ASGISA)	Esselaar, S., Gillwald, A., Moyo, M., Naidoo, K. South African ICT Sector Performance Review 2009/2010 - Towards Evidence-based ICT Policy and Regulation Volume Two, Policy Paper 6. 45 p., www.researchictafrica.net, 2010. Steve Esselaar Alison Gillwald Christoph Stork
Subtotal		All tech factors (4)	11		

RADAR CHART	Sum of weights	Number of factors	Average	Multiplied by ten (to create the size of the point in the radar chart)
GEO & ENVIRONMENTAL FACTORS	21	6	3.50	35.0
SOCIO-CULTURAL FACTORS	28	11	2.55	25.5
ECONOMIC FACTORS	41	14	2.93	29.3
POLITICAL AND LEGAL FACTORS	39.5	14	2.82	28.2
TECHNOLOGICAL FACTORS	11	4	2.75	27.5

Appendix SA3: References for South Africa country report

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