THE ROLE OF AGRICULTURAL NATURAL RESOURCES ON FOOD SECURITY AND JOB CREATION

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Presentation Outline

- Overview
- South Africa’s Agricultural Region
- Field Crops Production
- Farming units and average farm size
- Forestry land area
- Animal production land area
- Dual Agricultural Economy
- Support to Small Scale Farmers
- Impact of climate change
- Food Crisis
- R & D Funds Sources
- Challenges
- Conclusion
Overview

• South Africa is a rich and diverse country with a vibrant cultural diversity and a spectacular range of vegetation types, biodiversity, climates and soil types.
  – Dual agricultural economy – commercialised & Subsistence

• Agriculture is critical for ensuring food security.
  – It is also a major employer, responsible for 8% of formal employment in the country.
  – food security, social welfare, job creation and ecotourism, while adding value to raw materials

• However, only 13 percent of South African soil is suitable for cultivation, of which 22 percent can be classified as high-potential land.

• The country is not only self-sufficient in almost all major agricultural products, but in a normal year it is also a net food exporter, thanks to the well-developed commercial farming.
  – Exports include raw sugar, fresh grapes, citrus, nectarines, wine, avocados, plums, maize, black tea, groundnuts, meat, pineapples, tobacco, wool and cotton.
Overview continue........

Years of Prediction

Genetic diversity loss (%)

Before 1900 1900-1999 2000-2007 Year Unknown

(FAO, 2007)
Overview

![Pie chart showing economic sectors: Agriculture 2.3%, Construction 3.2%, Utilities 2.0%, Personal services 5.9%, Transport and communication 9.1%, Mining 5.2%, Trade and accommodation 12.0%, General government services 13.6%, Manufacturing 14.8%, Finance, real estate and business services 21.5%.]

![Bar chart showing rural:urban ratio by province.]

- Limpopo: [Bar chart showing population distribution]
- North West Province: [Bar chart showing population distribution]
- Free State: [Bar chart showing population distribution]
- Eastern Cape: [Bar chart showing population distribution]
- Western Cape: [Bar chart showing population distribution]
- Northern Cape: [Bar chart showing population distribution]
- Mpumalanga: [Bar chart showing population distribution]
- KZN: [Bar chart showing population distribution]
- Gauteng: [Bar chart showing population distribution]
Agriculture in South Africa contributes around 10% of formal employment, relatively low compared to other parts of Africa, as well as providing work for casual labourers and contributing around 2.6 percent of GDP for the nation.\[1\] Due to the aridity of the land, only 13.5 percent can be used for crop production, and only 3 percent is considered high potential land

South Africa’s Agricultural Regions
• 80 percent of South Africa is semi-arid to arid, and only 18 percent is dry sub-humid to humid
The Free State, North West and Mpumalanga highveld can be considered collectively as South Africa’s "bread basket". Maize is the dominant field crop in all three provinces, followed by wheat (Free State), sunflowers, dry beans, grain sorghum and groundnuts (Free State and North West).
Farming units and average farm size

Source: DAFF
Mpumalanga east of the Drakensberg favours forestry. There is an important area of forest also in Kwazulu-Natal. Forests receive little or no fertilizer.
Very extensive cattle and sheep farming predominate NC and EC.
The greater part of this subsistence region has a high agricultural potential but is underdeveloped.
The typically dry savanna of Limpopo Province is devoted to cattle farming.
Dual Agricultural Economy

- South Africa has a dual agricultural economy
  - well developed commercial farming and smaller-scale communal farming (located in the former homeland areas).

- The commercial agricultural sector has grown by approximately 14% per year since 1970, while the total economy has grown by 14.5% over the same period, resulting in a decline of agriculture’s share of the GDP to 2.5% in 2008 (Amy Goldblatt, Agriculture: Facts & Trend, South Africa).
Support to small scale farmers

- Smallholder farming has become central to job creation and economic growth in South Africa.
- Smallholder farmers are therefore encouraged to produce and drive economies in their respective communities.
- The DAFF increased its support to new and existing smallholder farmers, working in close collaboration with the provinces to achieve its targets.
- A Smallholder Development Working Group was established to strengthen collaboration between the parties that deal with the smallholder support mandate.
- The department encourages household food production through backyard gardens and programmes such as the Household Food Security and Ilima-Letsema Campaign, whose main objective is to motivate communities to plough, plant and produce their own food.

- However some of these initiatives has not been successful due to certain failure points.
> 53 million population
Per capita consumption of 13.72kg/year
7 to 13% Agricultural GDP

Affluent consumers
premium Markets

Restaurants
Wholesalers
Retailers

Integrated feedlots

Feedlots
(Where 70% of RSA
cattle are finished
before slaughter)

Developed sector
50 000 High Income
producers & 2250 Elite
Breeders

8.3 million beef cattle

35 000 tonnes
exported

13 000 to 48 000
tonnes imported

Meat processors
(495 Abattoirs)
2 400 000
to
2 800 000
Slaughters
640 000
tonnes produced

Poor consumers
(cheap cuts
market)

Meat processors
(495 Abattoirs)
2 400 000
to
2 800 000
Slaughters
640 000
tonnes produced

Failure point: Limited direct access to
feedlot market due to people and animal

Failure point: Lack of
support targeting
individual change to fit
into RSA beef chain

Failure point: Limited flow of
improved bull due to people &
capitals

Failure point: Very
low market off-take

Failure point: Low herd productivity
due to people & capitals

Export

Tanneries for automotive
industries

Hides

Developing sector
Markets
Butchers
Auctions
Speculators
Festivities

Developing sector
Land reform
Farmers
15 000
Emerging Farmers
87 000
Communal farmers
3 million

5.7 million Beef cattle

13 000 to 48 000
tonnes imported

8.3 million beef cattle

150 000 to 300 000
weaner imported

800 000
weaners

35 000
tonnes exported

6.3 million
beef cattle

87 000
weaners

2.5 million
beef cattle

150 000 to 280 000
weaners

Nedambale@2012
Animal Biotechnology for Increased Productivity and Food Security
Impact of climate change

Projected impact of climate change on agricultural yields

South Africa depend heavily on agriculture and natural resources to live. Coal and metal ore mining are also significant contributing sectors of the economy, but are decreasing in the 21st century due to climate change (Heinrich Böll Foundation, 2010)
## Impact of climate change continue.......

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>• Change in quantity and timing of precipitation</td>
</tr>
<tr>
<td>Feed</td>
<td>• Land use and systems changes</td>
</tr>
<tr>
<td></td>
<td>• Changes in the primary productivity of crops, forage and rangeland</td>
</tr>
<tr>
<td></td>
<td>• Changes in species composition</td>
</tr>
<tr>
<td></td>
<td>• Quality of plant material</td>
</tr>
<tr>
<td>Biodiversity (Genetics and Breeding)</td>
<td>• Loss of genetic and cultural diversity</td>
</tr>
<tr>
<td></td>
<td>• Both livestock and crops</td>
</tr>
<tr>
<td></td>
<td>• Change in ecosystem function and resilience</td>
</tr>
<tr>
<td>Livestock (and human) health</td>
<td>• Change in pattern and range of vector-borne disease and helminth infections</td>
</tr>
<tr>
<td></td>
<td>• Loss of disease resistant livestock breeds</td>
</tr>
<tr>
<td></td>
<td>• Change in pattern of human disease, including malaria, Schistosomiasis, and filariasis</td>
</tr>
<tr>
<td></td>
<td>• Increase in heat-related mortality and morbidity</td>
</tr>
</tbody>
</table>

Calvosa et al., (2010)
Livestock Production in Climate Change

Impact of management and technology interventions designed to improve productivity on greenhouse gas emissions from livestock (Gill et al., 2010)
Cattle Breed Better Adapted to Changing Conditions

Nguni Cow

One of Trenly’s Nguni cows in 2008, two years into the drought. Photos: Trenly Spence

No room for sentiment when drought strikes.

The same cow in the same camp in December 2009, in remarkably good condition.
### Direct and indirect impacts of climate change on livestock production systems

<table>
<thead>
<tr>
<th>Grazing systems</th>
<th>Non-grazing systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct impacts</strong></td>
<td></td>
</tr>
<tr>
<td>extreme weather events</td>
<td>water availability</td>
</tr>
<tr>
<td>drought and floods</td>
<td>extreme weather events</td>
</tr>
<tr>
<td>productivity losses (physiological stress) owing to temperature increase</td>
<td></td>
</tr>
<tr>
<td>water availability</td>
<td></td>
</tr>
<tr>
<td><strong>Indirect impacts</strong></td>
<td></td>
</tr>
<tr>
<td>agro-ecological changes:</td>
<td>increased resource price, e.g. feed and energy</td>
</tr>
<tr>
<td>fodder quality and quality</td>
<td>disease epidemics</td>
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<tr>
<td>host–pathogen interactions</td>
<td>increased cost of animal housing, e.g. cooling systems</td>
</tr>
<tr>
<td>disease epidemics</td>
<td></td>
</tr>
</tbody>
</table>

adapted from Thornton & Gerber (2010)
Impact of climate change

Change in agricultural output potential due to climate change: 2000-2080

-20% -15% -10% -5% 0% 5% 10%

Africa
Latin America
Middle East and North Africa
Asia
Developing countries
World
Industrial Countries

Change in output potential (2080 as % of 2000 potential)

Source: World Resources Institute, 2007
## Contribution to Total Meat Production and Consumption by Different Livestock Species

<table>
<thead>
<tr>
<th>Species</th>
<th>Production</th>
<th>Consumption</th>
<th>GHG emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry</td>
<td>48</td>
<td>43</td>
<td>26</td>
</tr>
<tr>
<td>Pigs</td>
<td>21</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>Cattle</td>
<td>22</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Sheep</td>
<td>10</td>
<td>9</td>
<td>21</td>
</tr>
</tbody>
</table>

Percentage contribution to total meat production and consumption by different livestock species in the UK and their relative contributions (%) to greenhouse gas (GHG) emissions (Gill et al., 2010)

The Committee on Climate Change (2008) adopted an approach of identifying three routes for abatement potential in relation to the GHG emissions by agriculture:

- **Lifestyle change** (i.e. less reliance on products with a high carbon cost associated with their production)
- **Change in farming practices.**
- **Using new technologies.**
Water availability

• Water availability is the single most important factor that limits agricultural production in South Africa.
• Furthermore, the situation is likely to become dire due to rapidly increasing demand from other sectors of the economy and climate change.
• 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 (Lundqvist et al., 2008)
Drought in Eden

Recent droughts in the Southern and Eastern Cape have highlighted just how vulnerable South African farmers are to reduced rainfall. Livestock farmers in these regions have had to truck in water and feed, drill boreholes and sell off cattle to survive the drought. In November 2009 the Eden District in the Southern Cape was declared a Disaster Area and drought relief was granted to the region’s livestock farmers in the form of feed vouchers. No relief was provided to ostrich or crop farmers. AgriSA has predicted that countless farmers are facing insolvency in 2010 because of the drought. This may be a taste of things to come as water demand begins to exceed supply across South Africa in the context of a changing climate.

Source data: Water Accounts for South Africa, 2000
Sustainable Agricultural Practices

• South Africa requires a more sustainable approach, or the welfare of our nation – both current and future generations – is at risk. Mismanaged agricultural industrialisation and intensification could compromise food safety and increase unemployment and environmental degradation.

In contrast, sustainable agricultural practices aim to:

✓ Change the way land and water resources are managed, so that their long-term productivity is optimised and sustained
✓ Contribute to the economic and social well-being of all
✓ Ensure a safe and high-quality supply of agricultural products
✓ Safeguard the livelihood and well-being of farmers, farm workers and their families
✓ Maintain healthy, functioning agricultural ecosystems rich in biodiversity
✓ Mitigate and adapt to climate change.
FOOD CRISIS

STATUS:

- South Africa is food secure nationally
- Food insecure in household

Prevalence of food insecurity
R & D Funds Sources
Challenges

- Lack of participation of small scale farmers to mainstream market
- Assets sitting with small scale farmers not contributing to our country GDP
- Declining of commercial farmers
- Population growth
- Wastage of food
- Climate change
- Industrialization of South Africa
- Water scarcity
- Mining
- Funding
Challenges continue….

Perhaps it is important to quote Gwede Mantashe (SG of ANC), who wrote “South Africa’s present and future food production and food security needs can be met, if we are able to deal with our past and build on it the future envisaged in the Freedom Charter. Skills development and mentorship is greatly required at this level. We should quantify the number of graduates who are in the various disciplines of agriculture in different institutions of higher learning. We must quantify the number of diplomats from the agricultural colleges. Then we must monitor their movement. The DAFF must have more agriculture professionals than administrative staff. Agriculture professionals must be jealous of their discipline. This can go a long way in improving the services to farmers and, thereby, improve food production.

The beneficiaries will always be projected as failure if land redistribution is not backed by professional support services”.

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Conclusion

• Protection of indigenous agricultural resources will save our biodiversity loss
• For every risk that agriculture provides to biodiversity, it also offers an opportunity
• Future engagements will need to take place throughout the agricultural value chain in order to ensure that all food products are produced in a way that is affordable, healthy and sustainable.
• In the 19th century we have created a system that is economically and ecologically unsustainable.
  – The result is that we are depleting our natural resources – rivers, arable land and species – faster than at any other time in history.
    • Fortunately, solutions are taking shape and there are signs that future growth will happen in more efficient and responsible ways
• We should respect and defend the integrity of the natural ecosystems that underpin the sustainable development of our country and the well-being of our people.
• Partnership between commercial and smallholder farmers should be encourage
THANK YOU