QUICK SCAN SOUTH AFRICA

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Netherlands Space Office

The Quick Scan for South Africa is commissioned by the Netherlands Space Office (NSO) within the framework of the Geodata for Agriculture and Water (G4AW) program. The following organizations have contributed to this document:

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INTRODUCTION

Within the framework of food security policy, the Ministry of Foreign Affairs of The Netherlands is implementing the programme 'Geodata for Agriculture and Water (G4AW) Facility'. The G4AW Facility aims to increase the agricultural sector output in G4AW partner countries. This is achieved by providing food producers with relevant information, advice and/or (financial) products through operational information chains using satellite data.

In the summer of 2014, a new call for tenders will be opened. In this call, the Ministry of Foreign Affairs of The Netherlands calls for good quality project proposals from viable partnerships.

Goal of the Quick Scan

The Quick Scan serves as input for preparing the country visit and the G4AW information and matchmaking workshop in South Africa. In the workshop the local context, constraints and challenges in agriculture will be discussed. Furthermore, the background and details of the G4AW Facility is provided and the development of partnerships is promoted.

This Quick Scan provides an up-to-date information assessment on agricultural and associated activities. It provides information from different perspectives and in a wider context (climate, water management). Additional, stakeholders from different types of organizations are identified and reported. The document is initially supporting the country visits and workshop, but the provided information can also contribute to the development of partnerships that are intending to bring forward a proposal in the second call of the G4AW Facility.

1 Assessment of South Africa with a focus on agricultural issues

Pressure on the agro-eco production systems caused by increased (overpopulation), climate changes and extreme weather conditions lead to a lack of natural local resilience. In this section, the most important challenges in the agro-eco systems in South Africa are given as well as an overview of (governmental) efforts to address the food security situation.

1.1 Main challenges in the South African agro-eco systems

The problems facing irrigation development and management in the recent past have mostly related to:

1. Environmental factors: water scarcity and poor water quality especially with regard to sediment concentration; land degradation as a result of poor operation and maintenance (O&M) activities due to inefficient water management practices. These result in water wastage and water logging including land-use regulation.
2. Capacities of farmers: there has been a lack of know-how in, and access to, the opportunities offered by irrigation technology; in addition, most farmers have a weak economic base and there is relatively high development costs involved in developing irrigation schemes.
3. Government policy; institutional and legal support: in general there has been limited or no priority given to irrigation development in national and local planning and budgeting; there are poor management structures in place to support farmers and promote irrigation development; and the current land tenure system does not encourage farmers to invest in permanent improvements on their plots.

The main water-specific challenges are:

4. In the South African Water systems (basins) or Watersheds the Incomati watershed is one of the most relevant basins where also Dutch cooperation has been realized and also the use of Geodata in support of water management issues. The Dutch Waterboard 'Waterschap Groot Salland' is involved in capacity building and knowledge transfer (Mr, Keimpe Sinnema is contact point).
5. In agricultural areas, shortage of water is mainly due to effects by climate change and this worsened in de past decades. The extremes of drought and water excess have clear impact on production and performance of many crops in the region (e.g Kaap region endures shortage a few months per year).
6. More and more organizations in the agriculture sector start recycling waste water into consumption for households and irrigation. Especially in the urbans areas. In rural areas contamination of groundwater/riverwater by mining activities becomes a severe problem.(North/East region of SA).
7. There are examples of Dutch projects where geo information in efficient wateruse in agriculture has been applied (e.g. Eleaf with her grapelook application).
8. In the agriculture and water (ministry) policies the goal is to enlarge the agricultural production by means of the implementing agencies in South Africa. For example the AQUA-SOIL approach[1] in the agriculture and horticulture sector of South Africa (Drakenstein[2]) is developed by such an implementing agency. (this is a sort of semi-private organization, or sometimes also investor in contract by the government executing and implementing governmental policies).

[1] http://www.aquasoilgroup.com/projecten.html

[2] http://www.aquasoilgroup.com/methode/projecten/96-drakenstein-zuid-afrika.html

9. From the Dutch Partners for water program there is a project for recycling waste water for horticulture. Bluedrop is an important initiative in the horticulture and Greendrop [3]
10. In the Kaap more and more large companies are active in Food and beverage (also breweries)
11. Min of Water (ask Keimpe Sinnema for more details) is actively developing policies on water in 9 catchment areas. WGS (Waterschap Groot Salland) is supporting this in for example the Incomati Catchment area. But also near Kaapstad (BOCMA, Waternet), KZN (Kwa Zulu Natal), Limpopo (WS Roer & Overmaas), see much more info on the Unie van Waterschappen website[4], together with the VNG and Water Governance Center.
12. In the bilateral cooperation (MoU) between Ministry of Water and Sanitation and the Dutch Ministry of I&M, there is also attention to water and water availability for agriculture. In this MoU possible addition of agricultural innovation (in G4AW context) in information in the sector could be an important add-on.
13. In general the water distribution in South Africa is a problem. There on many places floodings in the river areas as there are also droughts in areas further from the river.
14. Capacity building in water management in cooperation with Dutch entities such as the WASH, water management & technology is undertaken by Dutch organizations such as, WUR, IHE-UNESCO, Stichting Wateropleidingen (Agnes Maenhout).
15. Project in development of drinking and surface water provision are performed by project with Vitens, Waternet[5], Kaapnet in South Africa.
16. In South Africa there is a large system of reservoirs and (hydro-electric) who provide cities with water (and power).
17. Most important problems is water systems are the water losses due to leakage and maintenance or inefficient use of water.

In addition the following are some of the challenges faced by small holder farmers in South Africa;

- Inadequate farming systems
- No access to weather forecasts
- Poorly performing breeds,
- Unfenced fields,
- Out-dated farming systems
- Lack of fertilizer,
- Irrigation and mechanization.
- Lack of education
- Poor market access,
- Inadequate financial assistance.
- Poor support services with problems with "red tape"
- Climate change predictions.
- A lack of water and the associated water infrastructure as a central cause.
- Insufficient training.
- Farmers said they "need more knowledge" and that adult literacy was low.

[3] http://www.aardbeiennet.nl/aardbei/nieuws/samenwerken-voor-duurzame-tuinbouw-zuid-afrika/

[4] http://www.uvw.nl/zoekpagina-zoekresultaat-nieuws.html?newsdetail=20140527-1744_officiele-samenwerking-zuid-afrika-en-nederlandse-waterschappen&highlight=zuid%20afrika

[5] http://www.wereldwaternet.nl/publicaties/nieuws/centre-of-expertise-ethekwini-van-start/

- Agricultural skills were low.
- Poor livestock production,
- Poor agronomic skills in ploughing and pest control,
- Poor management skills that included poor bookkeeping.

Background

South Africa situated on the southern tip of Africa. It is bordered by the Atlantic Ocean on the west, the Indian Ocean on the south and east. Along its northern border, from west to east, lieNamibia, Botswana, and Zimbabwe, and to the northeast are Mozambique and Swaziland and the kingdom of Lesotho is also enclosed in South Africa.

As shown in Figure 1, South Africa has nine provinces. Gauteng, the smallest and most densely populated, adjoins Limpopo, North West and Mpumalanga in the north. The Northern Cape, the largest province with the smallest population, is in the west. The Free State is in the middle of the country. And the coastal provinces of KwaZulu-Natal, the Eastern Cape and the Western Cape lie to the south.

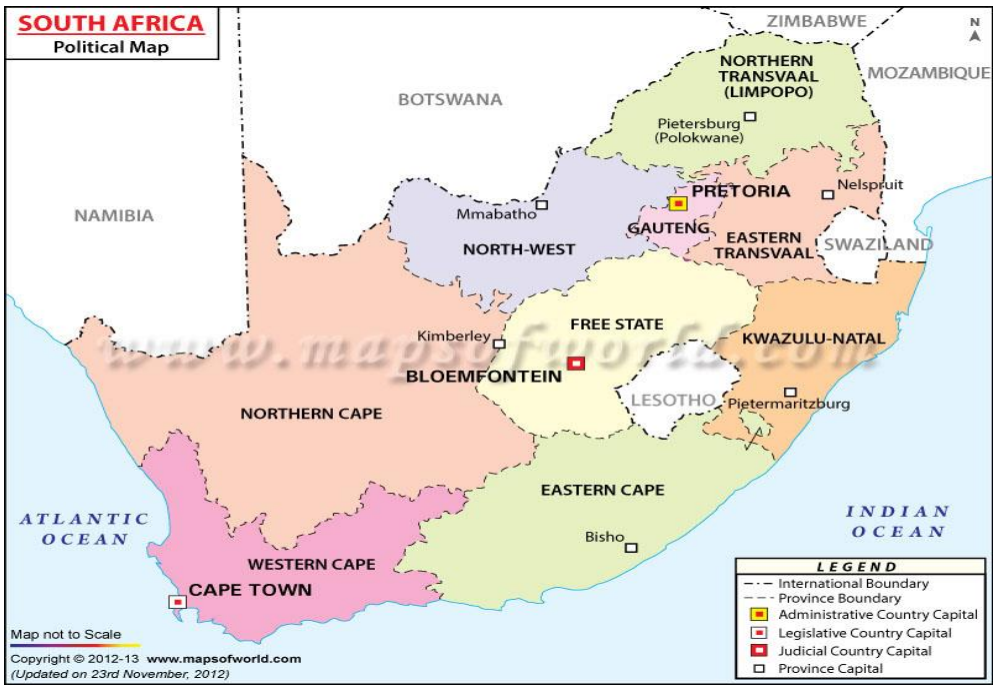

FIGURE 1.1: ADMINISTRATIVE MAP OF SOUTH AFRICA[6]

As one of the most employment-intensive sectors of the economy, agriculture's potential impact on empowerment and poverty relief is much larger than its actual weight in the economy suggests. While the primary agricultural sector contributes about 3% to the country's gross domestic product (GDP), it represents about 7% of formal employment. If the entire value chain of agriculture is taken into account, its contribution to GDP reaches about 12%. Agricultural activities range from intensive crop production and mixed farming to cattle ranching in the bush veld and sheep-farming in the more arid regions. About 12% of South Africa's surface area can be used for crop production. High-potential arable land comprises only 22% of total arable land. Some 1.3 million ha are under irrigation.

[6] Source: maps of the world

CONTEXT AND ISSUES OF AGRICULTURE

South Africa is a rich and diverse country. It has a vibrant cultural diversity and a spectacular range of vegetation types, biodiversity, and climate and soil types. The country can be divided into distinct farming regions, and farming activities range from intensive crop production in winter rainfall and high summer rainfall areas, to cattle ranching in the bush-veld and sheep farming in the more arid regions. African Agriculture is divided into three spheres:

- Million households who augment nutrition through gardening and livestock production
- An estimated 200,000 small holder farmers on 14 million ha of land
- 40,000 commercial farmers on 82 million ha.

Agriculture contributes a relatively small share of the total GDP, but is important in providing employment and earning foreign exchange. 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. However, there are strong backward and forward linkages into the economy, so that the sector is estimated to actually contribute about 14% of the GDP. Agricultural sector has been through an extended period of deregulation and restructuring. Between 1965 and 2009 the contribution of agriculture to GDP has declined from 9% to 3% (DAFF, 2012).This has been mirrored by declining levels of State support for the agricultural sector. The value of policy transfers to South African

agricultural producers, as measured by the OECD Producer Support Estimate (PSE), equaled 5% of gross farm receipts on average in 2000–03 compared to 31% in the European Union (Organisation for Economic Co-operation and Development, 2006). By 2001 state spending on agriculture had declined by 45% from 1998 (Vink& Kirsten, 2003).

Over the last 15 years, South Africa has undergone immense social and economic changes, with fundamental structural reforms resulting in an open, market-oriented economy. Some of these changes were intended, while others are the result of the country's integration into the global economy following the end of apartheid-era sanctions. The changes in policy were intended to remove the socialist control of agriculture prevalent under the Nationalist Government, improve the lot of farm labourers, and redress land inequalities.

Snapshot of South Africa				
			Year	Source
Population	Total	48,375,645.00	2014	Stats SA
	Urban	62%	2013	Stats SA
	Rural	38%	2013	Stats SA
Agric Households		19.9%	2013	Stats SA
Poverty Levels		56.8%	2013	Stats SA
Population below PDL		31.3%	2013	CIA Factbook
Unemployment Level		24.9%	2013	Stats SA
Area (total)		1,219,090.00 sq km	2014	CIA Factbook
Land		1,214,470.00 sq km		CIA Factbook
Land Use	Arable	9.87%		CIA Factbook
	Permanent Crops	0.034%		CIA Factbook
	Other	89.79%		CIA Factbook
	High potential arable land	4.00%		DAFF: A Collett
Water	Irrigated Land	16,700.00 sq km		CIA Factbook
	Water	4,620.00 sq km		CIA Factbook
	Total Renewable Water Resource	51.4 cu km	2011	CIA Factbook
Climate		mostly semi-arid, subtropical along east coast		CIA Factbook
	Rainfall	Annual range ≤200mm (western part) to ≥1000mm (eastern part of SA)		DAFF: A Collett
		Just over half the country receives less than 500mm		DAFF: A Collett
Terrain		vast interior plateau rimmed by rugged hills & narrow coastal plain		CIA Factbook
Soil	Shallow soils	33.3% of country		DAFF: A Collett
	Exposed rock	13.2% or 16m ha		DAFF: A Collett
	Soils deeper than 900mm	20% of country		DAFF: A Collett
	Average soil depth	577mm		DAFF: A Collett
GDP	2013 est.	$595.70 billion		CIA Factbook
GDP Sector origin	Agriculture	2.60%	2013 est.	CIA Factbook
	Industry	29.40%	2013 est.	CIA Factbook
	Services	68.00%	2013 est.	CIA Factbook
Gross Farming Income	2013 est.	ZAR131.5 billion	2013 est.	Stats SA
Major Agricultural Zones	KwaZulu Natal	24.40%	2013 est.	Stats SA
	Eastern Cape	20.70%	2013 est.	Stats SA
	Limpopo	16.30%	2013 est.	Stats SA
Major Agricultural Products		Corn, wheat,sugarcane, fruits, beef,poultry, mutton, wool, dairy pcts		CIA Factbook

TABLE 1: GENERAL OVERVIEW OF SOUTH AFRICA[7]

[7] Source: CIA Fact Book 2014 & Stats SA 2014 (Websites visited on 27/05/2014)

Climate

The agriculture sector in South Africa faces considerable impact from climate change, which affects the livelihoods of the majority of people, especially those that are vulnerable to food insecurity. South Africa responds to international obligations regarding climate mainly through the Department of Environmental Affairs, but the Department of Agriculture, Forestry and Fisheries, as well as other departments such as the departments of mineral resources, energy, science and technology, and water affairs are also involved. The Climate Change Programme implemented by the Department of Agriculture Forestry and Fisheries include programmes on raising awareness, policy development, development of sector mitigation and adaptation plans, conducting vulnerability assessments countrywide, and identifying and coordinating climate-related research projects. South Africa is a full member of the Global Research Alliance, which among other objectives aim to enhance collaborative research into agricultural emission reductions and increase support and resourcing for agricultural emission research.

Climate change is expected to disproportionately affect smallholder farmers by further exacerbating the risks that farmers face. Recent studies using regional and global simulation models, for example, indicate that even moderate increases in temperatures will have negative impacts on rice, maize and wheat, which are the main cereal crops of smallholder farmers. Climate change is also expected to alter pest and disease outbreaks, increase the frequency and severity of droughts and floods, and increase the likelihood of poor yields, crop failure and livestock mortality. As many of the countries that will be the hardest hit by climate change are tropical countries with large populations of poor, smallholder farmers], there is an urgent need for the global community to focus its attention on identifying adaptation measures that can help these farmers reduce their vulnerability to climate change and cope with adverse consequences.

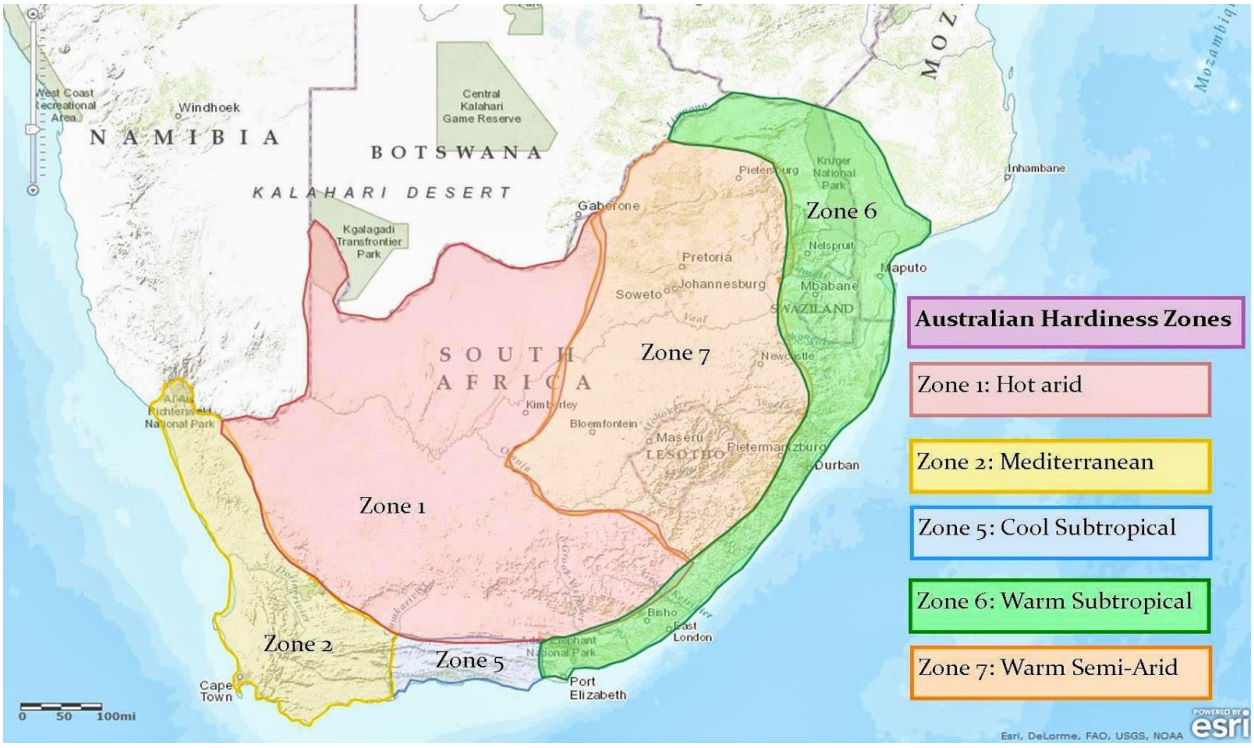

FIGURE 2: CLIMATIC MAP OF SOUTH AFRICA

Soil

More than 5 million hectares (more than double the size of Kruger National Park) of cultivated land have already been seriously acidified in South Africa (SA Yearbook, 2008/9). This degraded soil is prone to erosion, and the subsurface soil layers that remain are significantly less fertile and less absorbent.

Soil suitable for production of rain fed crops	12%
Truly fertile land/prime agricultural land	3%
Land surface suitable for grazing	69%
Land area moderately to severe acidic	60%
Land affected by subsoil acidity	15%
Land surface at high erosion risk	1%
Land highly susceptible to wind erosion	25%

TABLE 2: SUBDIVISION OF LAND AREA

Large areas of South Africa are covered with soils prone to serious crusting (surface sealing). The extent thereof and awareness of it have increased sharply over the last two decades. Switching to overhead and micro-regulation systems and the widespread effects these have on crusting-prone soils has contributed to the problem. Human-induced soil acidification is also a major problem. Its effect is severe since it impacts on the country's scarce, arable land, especially the limited high-potential agricultural land. Soil-fertility degradation is a concern. In commercial agriculture, there has been nutrient capital-building of some nutrients, especially phosphorus and zinc. In some cases, phosphorus has built up to excessive levels, where it starts to reduce crop yields.

Irrigation and Rainfall Patterns In South Africa

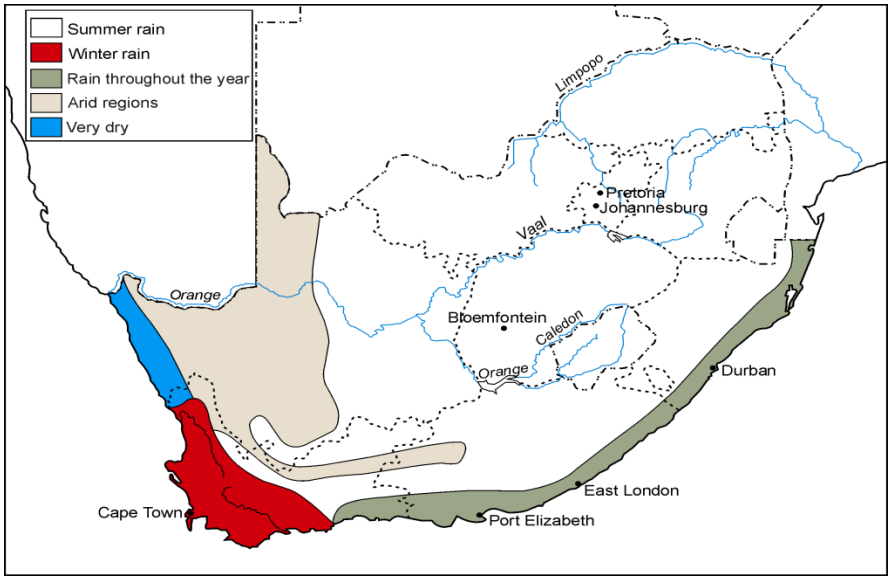

FIGURE 3: RAINFALL MAP OF SOUTH AFRICA

Irrigated agriculture is by far the biggest single user of run-off water in South Africa and has substantial potential to make a significant socio-economic and social impact on rural society. It contributes more than 30% of the gross value of the country's crop production. The Department of Agriculture, Forestry and Fisheries has embarked on a process to rehabilitate irrigation schemes that have the potential to increase food production, eradicate poverty, create jobs and contribute to economic growth. About 90% of the country's fruit, vegetables and wine are produced under irrigation. The department has identified the revitalisation of irrigation schemes and development as a priority.

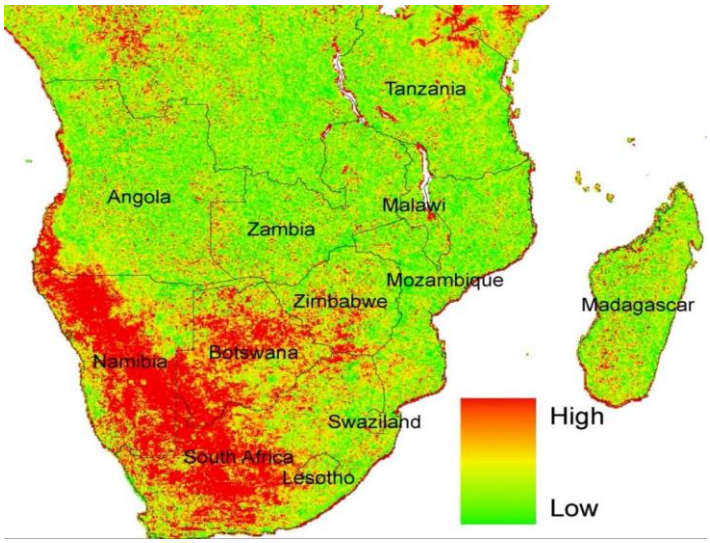

FIGURE 4: DROUGHT FREQUENCY MAP

Infrastructure

As most of the rural population in South Africa is subsistence farmers, most isolated rural areas are able to realize only a small percentage of their full potential. Studies show that the exploitation of the potential for agriculture in rural areas is the highest in zones that are between two to five hours travel time from the nearest large town. Beyond this time zone frame, the ratio of actual production to potential drops very sharply (Murray, 2008). There is a huge rural infrastructure backlog resulting from decades of under investment, lack of maintenance, and destruction and dilapidation due to conflict. The quality of infrastructure is generally poor and infrastructure service costs are relatively high.

Crops

CROPS	PROVINCE
MAIZE	North West, Free State and Mpumalanga
WHEAT	Western Cape and Free State
MALTERN BARLEY	Free State
SORGHUM	Mpumalanga, Free state, Limpopo and North West
SUGAR CANE	KwaZulu Natal
DECIDIOUS FRUIT	Western Cape, Free State, Mpumalanga and Gauteng.
PINEAPPLES	Eastern Cape and in northern KwaZulu-Natal
SUBTROPICAL CROPS LIKE MANGOS ETC	Mpumalanga and Limpopo, and in the subtropical coastal areas of KwaZulu-Natal and the Eastern Cape.

TABLE 3: OVERVIEW OF LAND USE

The largest area of farmland planted with field crops is maize, followed by wheat and, to a lesser extent, sugar cane and sunflower seed. The grain industry is one of the largest in South Africa and is a very strategic one. The following diagram shows provincial crops grown in different provinces in South Africa.

Knowledge, Extension Services and Research

The Directorate: National Extension Reform (NER) has developed an integrated national policy on extension and advisory services. The development of a nationwide, unified and all-inclusive National Extension and Advisory Services Policy was done in partnership with the Agricultural Research Council (ARC). The new policy seeks to shape

and align research and extension across the three sectors (agriculture, forestry and fisheries). This policy will inform the management, coordination and implementation of Extension and advisory Services in South Africa.

Organisation of Producers

- South Africa has many organizations or associations like the following:
- Independent Producers Organisation of South Africa.
- Milk Producers Organisation south Africa
- Citrus Growers Association of South Africa
- Commercial Producers of South Africa
- Garlic Growers of South Africa
- The South African Pork Producers' Organisation
- National Emergent Red Meat Producers
- Dry Bean Producers Organisation
- Red Meat Producers Organisation

1.2 GOVERNMENTAL EFFORTS AND POLICY ON FOOD SECURITY

At the Dutch Embassy several important bilateral programmes with South Africa have been developed. An interesting development in the horticulture sector is GreenPort Holland International (contact point is Niek Schelling, (Dutch EKN, Landbouw Raad Pretoria)[8]

In general there is enough water available, more important is the problem how to apply it efficiently as water is regarded in general as a public good. A recent market study "Water in Agro-processing' was conducted by Brett Cohen, Kyle Mason-Jones and Natasha Rambara in conjunction with the Dutch embassy. From this report the following main agriculture crops have an interest in good water (availability):

1. Maize and wheat are two of the three top crops in South Africa (along with sugar cane) and grain milling is a large component of South Africa's agro-processing industry. However, grain milling does not represent a significant market for water technologies, as water use in such facilities is relatively small.
2. Sugarcane farming and processing is one of the largest agricultural activities in South Africa, producing 2.2 million tons of sugar per year and generating considerable export revenue. Although domestic sugar demand is growing, sugar production has declined substantially in the last decade as sugarcane supply has been restricted by difficulties in the agricultural sector (a.o. water issues). The sugar milling industry is largely located in KwaZulu-Natal province.
3. Malt beer sales made up 51% of revenue in the South African liquor market, with sales of over 27 million hectoliters in 2009. Breweries are spread geographically across the country.

NATIONAL STRATEGIC PLANS FOR THE AGRICULTURAL SECTOR

The strategic sector plan national scale on has the following as its objectives:

1. Create a common vision for key stakeholders
2. Design and implement a strategic framework to guide policy and implementation in the future
3. Address issues undermining investor confidence and the building of better understanding and good social relations
4. Ensure increased access and participation in the sector through well-designed empowerment processes and programmes

[8] Source: http://www.greenportthollandinternational.nl/afrika/zuid-afrika-2/

5. Combine, share and optimise the resources and benefits among the partners
6. Foster global competitiveness, growth and profitability in the sector in order to attract new investment
7. Ensure sustainable development
8. Build lasting partnerships among public, private and community stakeholders and NGOs

The Integrated Growth and Development Plan

The Integrated Growth and Development Plan (IGDP) which run from 2011 to 2031, was developed to provide a long-term strategy for the growth and development of South Africa's agriculture, forestry and fisheries sectors, to enable them to address the following key national priorities and outcomes:-

1. Ensuring national and household-level food security
2. The economic growth and development of agriculture
3. Rural economic development.

The Food Security Production Programme

The Food Security Production Programme seeks to:-

1. Link subsistence producers and smallholder producers to government institutions;
2. In the medium term a conduit through which food produced by smallholders can be used to meet the nutritional needs of low-income individuals and households in communities at large;
3. Provide a boost to existing smallholder producers and an opportunity through which heretofore subsistence producers can start generating a sustainable income through farming and thereby become smallholder producers in their own right.

Support for the sector

Support for the Agriculture sector is undertaken through the following initiative:

1. The provision of post-settlement support to farmers who benefit from land reform's restitution, redistribution and tenure reform.
2. The identification of new farmers from historically disadvantaged groups who have gained access to land by private purchase, rental, and bequests.
3. The initiation of innovative development programmes for farmers on communal land. The emphasis is on solving problem areas and on steps to assist small holder farmers to become successful producers in the shortest possible time.
4. Commitment of Principal stakeholders in the sector focusing their attention on farmer support programmes that create an inclusive agricultural orientation through, amongst others, promoting partnership programmes, strategic work sessions and joint ventures in the following specific areas:
    - Improved market access and removal of market barriers to new entrants
    - Enhanced transfer of technology to new farmers through one-stop farmer support centres at local level
    - Implement a human resource development plan, which includes young entrepreneurial development and mentorship projects
    - Improved access to a comprehensive range of rural financial services *via* outreach and efficiency of rural finance institutions
    - Improved focus, collaboration and coordination between government institutions, organised agriculture, nongovernment organizations and civic associations that are involved with farmer development programmes through forums at national, provincial and local level.
    - Improved ability and efficiency of the extension personnel within the private sector and Provincial Departments of Agriculture

Integrated and sustainable rural development[9]

The strategic intent of the Integrated and Sustainable Rural Development Strategy (ISRDS) is to transform rural South Africa into an economically viable, socially stable and harmonious sector that makes a significant contribution to the nation's GDP.

The following areas are vital to the strategy:

1. Local economic development with particular attention focused on rural towns, service centers and villages
2. Strengthening the profile and role of agriculture and related industries in the Integrated Development Planning processes of especially rural local authorities
3. Special attention given to the promotion of income generation and livelihood activities by women, the youth and disabled that are primarily geared to meeting the needs of poor families and local market demands
4. Rural development nodes
5. Rural settlement planning to accommodate new settlement patterns that are evolving since the removal of apartheid settlement laws and the dawn of the post-1994 democratic order.

The role of agriculture in South Africa in ensuring enhanced food supply has been highlighted in both commercial farming and small scale subsistence farming. South Africa benefits from diverse climatic conditions that range from tropical to Mediterranean, semi-desert to savannah. These weather conditions allow for a large variety of commercial and food crops to be cultivated. South Africa has become food sufficient on a national level and a net exporter of agricultural products. However, household food security seems to reveal a disturbing scenario. The income of farmers and producers is estimated at over 90 billion South African Rand yearly. The agricultural sector is focused mainly towards the production of high value horticultural crops such as fruits e.g. grapes for wines. Cereals and grains are crops that cover most of the agricultural domain.

However, over the years, the South African agricultural industry has stagnated and even declined as the manufacturing and mining sectors grew. As a result of growth of the population, food security has become a pressing issue, which has been tackle through a number of policy frameworks since 1994. According to Food bank South Africa, more than 20% of the population has insufficient access to food about fourteen (14) million South Africans are vulnerable to food insecurity[10].

Government spending is dispensed to focus on the role of agriculture in South Africa, in ensuring a strong food supply to its citizens. There are several food security programmes running concurrently. The South African Government launched a more efficient and integrated food security program. It was titled the Integrated Food Security Strategy (IFSS). The vision of the IFSS was in line with the definition of food security according to the Food and Agricultural Organization of the United Nations (FAO). Its goal has been to eradicate malnutrition, food insecurity and hunger in South Africa by 2015.

National food security indicators reveal that South Africa has been able to meet the food needs of its growing population over the past 20 years. However, there are no clear statistics to ascertain that the food insecurity condition is the same at household level, especially in rural areas of South Africa. Demetre *et al* 2004, confirm South

[9] Source: www.daff.gov.za and www.agis.agric.za/mis

[10] Source: c.f: www.foodbank.org.za.

Africa's national food secure status but suggests that more than 14 million people, or about 35 % of the population in the country are estimated to be vulnerable to food insecurity. It is also reckoned that as many as about one quarter of children under the age of six have been stunted by malnutrition.

Post-apartheid policies, including the IFSS, all aim to address the adverse impact of apartheid on agriculture, its productivity and implications on food security at household level. As a consequence of the policy debates on agriculture and food security, the IFSS turned out to be a multidimensional strategy, structured mainly around household food security in rural areas.

Section 27 (1) of the South African Constitution, states clearly that ***"Everyone has the right to have access to … sufficient food and water … The state must take reasonable legislative and other measures, within its available recourses, to achieve the progressive realisation of each of these rights."***(IFSS, 2002). The vision of the IFSS is ***"to attain universal physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life."*** This vision is closely aligned with the definition of food security provided by the United Nations Food and Agriculture Organisation (FAO).

The IFSS's goal is linked to the Millennium Development Goals (MDGs), especially MDG and is ***"to eradicate hunger, malnutrition and food insecurity by half by 2015."***

The IFSS has adopted a broadly developmental rather than strictly agricultural approach to food security. It focuses mainly on household food security, without overlooking national food security, although South Africa is "food-secure" at national level.

Governmental Efforts and Policy on Food Security

The management of agricultural land in South Africa is administered according to the provisions of the Sub-division of Agricultural Land Act, 70 of 1970 which defines agricultural land as land that is located outside the demarcated municipal boundaries prior to 1994. However, this definition excludes some land despite its agricultural potential. Feeding into this is a cocktail of multi-annual national programmes and plans aimed agricultural development. The underlying theme of these programmes is food security which, despite multiple variations in terms of its definition, the World Bank (1986) defines as "access by all people at all times to enough food for an active and healthy life"[9]. Notably the Strategic Plan for South African Agriculture of 1995 but more recently the National Development Plan Vision 2030 (NDP) became the flagship Programme for the incumbent government as a key tool necessary for achieving food security, among other projections.

The legislation/programmes like the Farmers Development Programme/Act and the Food Security Programme/Act were designed with the aim to abet food security challenges through the use of spatial planning initiatives and information management systems for decision support systems. Their express ambitions were to support:

- Market development programmes with specially generated markets for smallholder farmers,
- Infrastructure development aimed at smallholder farmers,
- Improved access to development finance for smallholder farmers[11],
- Improved access to information, knowledge and training resources,
- Improved planning and implementation of farming practices and,
- Improved natural resource management, through spatial information management, and planning systems.

[11] See Annex 1

There was also an array of factors which played an influential role in the trajectory of South African agriculture namely:

- The Marrakech Agreement and its Agreement on Agriculture: paved way for liberalization of the controls over the import and export of agricultural commodities. The same was applicable and applied to the South African Customs Union (SACU).
- The government dismantled the structure of direct subsidies in place since 1945 which was mainly in form of on-farm infrastructure like dams, fencing, etc. Despite latter efforts to put similar measures in place to assist smallholder farmers and land reform beneficiaries the changing market environment presented a series of challenges which made the programmes ineffectual.
- Government introduced a gamut of programmes to regulate the use of land, water resources and farm labor and these had significant impact on farming.
- The agricultural development agenda was also largely shaped by the following policy propositions:
    - Broadening Access to Agriculture Thrust (BATAT);
    - The White Paper on Agricultural Policy;
    - The Agricultural Policy in South Africa Discussion document;
    - The Strategic Plan for South African Agriculture , "Sector Plan" and,
    - The Accelerated and Shared Growth Initiative for South Africa (ASGISA).

These policy position documents and legislation were certainly implemented by an institutional framework which comprises the following the government levels and department.

The role of the Departments of Agriculture – National and Provincial

The challenge for South African smallholder development policy is understood to be the creation of conditions necessary to motivate and enable smallholder farmers to progress from subsistence to commercial producers, a process referred to as smallholder empowerment (Department of Agriculture, 2001:8 and Backeberg, 2003:165). In post-apartheid South Africa, agricultural policy has aimed to create a new unified agricultural economy, in which both large and small farm enterprises compete harmoniously on local and international commodity markets (Department of Agriculture, 2001:3). Smallholders are commonly categorized into three groups, namely 'subsistence farmers', who make up the large majority, 'commercial farmers', a small minority, and a third group called 'emerging farmers' (Department of Agriculture, 2001:5,8).

The Department of Agriculture, Forestry and Fisheries

The Department of Agriculture, Forestry and Fisheries (DAFF) directorate on small-holder development aims at improving on the production systems and development support of smallholder farmers (producers) in the agriculture, forestry and fisheries sectors to achieve food security and sustainable livelihoods for all South Africans. The guiding document currently is the developed Strategic Plan for Smallholder Support (SPSS) which seeks to improve coordination of support to smallholder producers by aligning and adjusting support functions to the benefit of the smallholder sector.

The SPSS is geared toward addressing immediate challenges facing small-scale producers, while providing alternative solutions for producers in the medium and long term. The SPSS proposes six main mechanisms or approaches that can be pursued in parallel in order to improve support to the smallholder sector:

- Improved planning and investment coordination;
- Massifying investment in skills;
- Initiating a stronger and more coherent approach to partnerships;

- Revising and refining infrastructure and mechanization support programmes;
- Scaling-up scheme-based interventions; and,
- Phasing in and expanding systemic interventions.

2 ASSESSMENT OF STATUS AND PROBLEMS OF INFORMATION SUPPLY IN THE AGRICULTURAL SECTOR

For food (and water) security programs, actual and accurate (spatial) information is crucial for land and crop production systems to provide quick indicators on the context (e.g. water availability), status (e.g. biomass, crop type, acreage, etc.) and trends (within and in between seasons, years) of local farming practices/performance. In this section, the main challenges in information supply in South Africa are summarized as well as the institutional capacity to support viable information services.

2.1 MAIN CHALLENGES IN INFORMATION SUPPLY ENCOUNTERED IN AGRICULTURAL ACTIVITIES

The current Cadastral situation in South Africa is extremely relevant for undertaking future business and cooperation between parties in commercial food chains and agricultural production systems. An interesting assessment, dated from 2000 by Dr. Clarissa Augustinus[12] reflects the landownership situation of transition from the period before and after Nelson Mandela came to power. A more recent situation is sketched by Mr Mimusa Riba from the Cadastre South Africa[13] and on policies implemented by the Cadastre[14]

Important developments are in the telecom and mobile phone industries, where app development for agriculture is currently take a high speed by local ICT and universities (Hydrologic BV from the Netherlands is currently working on these implementations from a water perspective in the urban and rural area).

Why SA Smallholder Farmers Face Challenges in Using Geo-data & Weather Forecasts

South African Smallholder farmers have a subsistence-oriented mindset. Their livelihoods are characterized by poverty, hunger, inadequate market access, infrastructure, low productivity and support services. Smallholder agriculture is typically associated with small land holdings, lack of cash, semi or complete illiteracy, limited storage, minimal access to market information and technologies that can boost production (Omamo, 2005). This is a major challenge since the use of geo-data comes with costs which the benefits may be perceived as less important than the immediate need for food in the table.

Moreover, the majority of smallholder farmers in South Africa are scattered and operate individually (lack organization) and this exposes them to high transaction cost. This is a problem when providing training and getting buy -in to this new technology to be accepted by the small holder farmers.

The small-scale farmers of South Africa are not financially sound; hence they are unable to purchase modern technology. They are unable to obtain and use new or advanced technology, due to a lack of knowledge, financial capacity and necessary infrastructure. The level of adoption of technology, specially the advanced technology models by small-scale farmers of South Africa is low. The lack of funding makes it extremely difficult for the small-scale farmers to undertake technological adoption.

Small-scale farmers especially in rural areas of South Africa, have little or no formal education. They are generally unable to make informed choices regarding farming. According to AOFF (2003) small-scale rural farmers of South Africa have little business experience, no organization and lack of information on technologies, markets and prices

[12] Source: http://users.iafrica.com/a/au/augusart/online_itcsa.html

[13] Source: http://www.africageospatialforum.org/2011/Proceeding/Mmuso%20Riba.pdf

[14] Source: http://csg.dla.gov.za/legal.htm

of products when there is surplus. The main objective for small-scale farmers is to bring food to the table for their families. The lack of education and knowledge regarding farming and markets make it difficult to use geodata to improve food sustainability and their market share.

Behavior Change - what behavior changes is required for the users to integrate the solution into their business cycle? Adopting new ICT solutions will require farmers and other value chain actors to change their behaviors. This can be difficult as many of their operations rely on relationships and systems that have been in place for decades. For instance, agricultural traders generally already have a network of contacts that they trust for a reliable price and it can take a lot to be convinced and build trust in a new system. New methods have been developed to address behavior change and technology adoption which can identify barriers to success such as power issues, literacy limitations, preferences, relative priority of features, and help to design effective solutions. The use of geo-data faces resistance since small holder farmers are not familiar with this kind of technological tool.

Technical Literacy - do users have the knowledge and skills to successfully use the solution? Not having the literacy of ICT tools has prevented many users, especially rural farmers, from accessing pricing information and other potentially useful tools. Lack of computer skills, lack of mobile use is also a major detriment for the use of geodata by small holder farmers in South Africa.

ICT-enabled social networks are not yet usable at the smallholder level and mostly require access to smart phones or computers, these trends are worth observing as they might not pose as a constraint since they are beginning to reach to the lower ends of the income spectrum and into more rural areas. Global social networks like Facebook, LinkedIn and Twitter are expanding in sub-Saharan Africa;

The other very important factor affecting small holder farmers in South Africa is trust factor that must be overcome for buyers to turn to new ICT-enabled forums as an alternative to their relationship-based trade. In addition, there are often not

At present the other pressing issue is accepted or understood grading standards for many of the agricultural products that smallholders produce, meaning that buyers often do not know the exact quality of the crop until they see it for themselves. Geodata information will therefore work as a catalyst to mitigate this challenge.

It has been observed that the difficulty to translate the geospatial data into indigenous languages diminishes its use and usefulness among the smallholder farmers since most of them struggle with foreign languages. Essentially, it would optimize the use of geo-spatial data if it could be transformed into usable format and translated into local indigenous languages.

2.2 Institutional capacity to support viable information services

2.2.1 General information suppliers active in agriculture domain

Information systems

The major sources of agricultural information for small holder farmers in South Africa are extension agents, radio, and group meetings. The most critically needed information relates to disease/pest control and cropping systems. The information received by small holder farmers is generally inadequate. Agriculture extension offices are seen as the most reliable information source. Many farming decisions were made in consultation with extension officers.

Agricultural systems

There is a need for and access to spatial information in South Africa for use in decision making and development planning is a topical issue which has inevitably led to discussions on uncoordinated effort, a lack of funding and expertise and the unavailability of good quality, standardized data. Although, the National Department of Agriculture, Provincial Departments of Agriculture, the Agricultural Research Council (ARC) and other spatial information providers there is a wealth of information. However, this information is not readily accessible; this resulted in the development of the Agricultural Geo-referenced Information system (AGIS). The vision of AGIS is to make South Africa's Agricultural information available on the Internet.

2.2.2 Specific agri-sector information supply and current mechanisms

Market information

Formerly controlled markets have been radically deregulated the Marketing of Agricultural Products Act (Act No. 47 of 1996) was passed. It provides for certain limited statutory interventions such as registration and information collection. The Marketing of Agricultural Products Act is based the view that state intervention in agricultural markets should be the exception rather than the rule. Proposed interventions in terms of the Act are subjected to a consultative process involving the National Agricultural Marketing Council (NAMC). Platforms such as the South African Grain Information Service (SAGIS) collects figures on the consumption, importation and exportation of maize, winter grains, sorghum and oilseeds of these initiatives for the efficient and transparent functioning of the market.

The National Crop Estimates Committee, coordinated by the Department of Agriculture, is responsible consolidation of information regarding the market relates to domestic production, and consumption, imports and exports by month. The South African government ensures that appropriate institutional arrangements are in place for collecting, analysing and disseminating information to small and medium-scale farmers. The focus is on information enabling farmers to make better decisions regarding what to produce, when to harvest and sell and where to sell. This will include information on:

- product requirements, quantity, quality and presentation
- market size
- input and producer prices and trends
- supply and demand trends
- marketing costs, including transport costs

Information systems outside the government

Organisation	Name	Description
FAO	Aquastat	AQUASTAT is FAO's global water information system, developed by the Land and Water Division. The main mandate of the programme is to collect, analyze and disseminate information on water resources, water uses, and agricultural water management, with an emphasis on countries in Africa, Asia, Latin America and the Caribbean. This allows interested users to find comprehensive and regularly updated information at global, regional, and national levels.
FAO	CountrySTAT	CountrySTAT is a web-based information system for food and agriculture statistics at regional, national and subnational levels. It is based on the FENIX platform, which uses the same open-source technology of the FAOSTAT family. CountrySTAT's objective is to improve access to food and agricultural statistics, which can: Support data analysis and evidence-based decision making. Facilitate informed policy making and monitoring with the goal of eradicating extreme poverty and hunger.

FAO	FAOSTAT	The FAOSTAT system is one of FAO's most important corporate systems. It is a major component of FAO's information systems, contributing to the organization's strategic objective of collecting, analyzing, interpreting, and disseminating information relating to nutrition, food and agriculture for development and the fight against global hunger and malnutrition. It is at the core of the World Agricultural Information Centre (WAICENT). WAICENT gives access to FAO's vast store of information on agricultural and food topics – statistical data, documents, books, images, and maps.
UN	UNOSAT	UNOSAT is the UNITAR Operational Satellite Applications Programme, implemented with the support of the European Organization for Nuclear Research (CERN) and in partnership with UN and non-UN organisations. UNOSAT is a technology-intensive programme delivering imagery analysis and satellite solutions to relief and development organisations within and outside the UN system to help make a difference in critical areas such as humanitarian relief, human security, strategic territorial and development planning. UNOSAT develops applied research solutions keeping in sight the needs of the beneficiaries at the end of the process.

TABLE 4: INFORMATION SYSTEMS OUTSIDE THE GOVERNMENT

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2.2.3 OTHER SECTORS (AND ROLE OF INFORMATION) IMPORTANT FOR THE AGRICULTURAL SECTOR

In the Catchment areas many measurements are done by local stations (also meteo data, like rainfall, humidity, evaporation, radiation, etc.) on water statistics on ground water, surface water (levels), etc. These measurements are important for validation of all kind of models available for water management and maintenance of water systems, which is very relevant for information update and crop management for the agricultural sector.

Main issue and bottleneck is the fair and equal distribution of water between the various sectors and within the agricultural sector itself. The other issue is how to control this and organize law enforcement. The use of water should be controlled by typical entities like waterboards. Currently the city councils are in charge but the CMA (or Catchment Management) agencies will take over control in the near future as the system is in transition. These authorities need to be provided with information and indicators for controlling the use and distribution of water available, which is currently still not in place. The control and monitoring over Water availability and its regulation is a public task implemented by local CMA entities in each catchment area but is centrally financed. This means that there is no local commercial driver yet for water information provision. This may change when the system is fully implemented and other sectors will also benefit from the regulation and monitoring. One might think of local food industry or horticulture

Currently, projects (like Waterschap Groot Salland, Hydrologic, etc) translate, transform therefore mentioned hydrologic model outputs into easy to use 'apps', which provide practical information for different users in various sectors. These applications can help in anticipating to droughts or water shortage for example

In the Cape region successful pilots between farmers, government, ecological managers are developed (Dutch DLG & Embassy), e.g. Living Lands, 4 elements, etc. large scale management.

3 NEEDS ASSESSMENT OF IMPROVED ICT & INFORMATION SUPPLY IN THE AGRI SECTOR

In this section, an inventory of specific needs and problems in the information supply (and demand) in South Africa Agri sector is provided. The most important local stakeholders represented in the identified problem domains are selected (short list). Furthermore, additional stakeholders in related domains need to be selected (e.g. water domain, nature, industry, etc.).

3.1 NEEDS ASSESSMENT WITH A FOCUS ON POTENTIAL USE OF SPATIALLY BASED INFORMATION SERVICES

The following schedule shows the potential use of spatial data in South Africa:

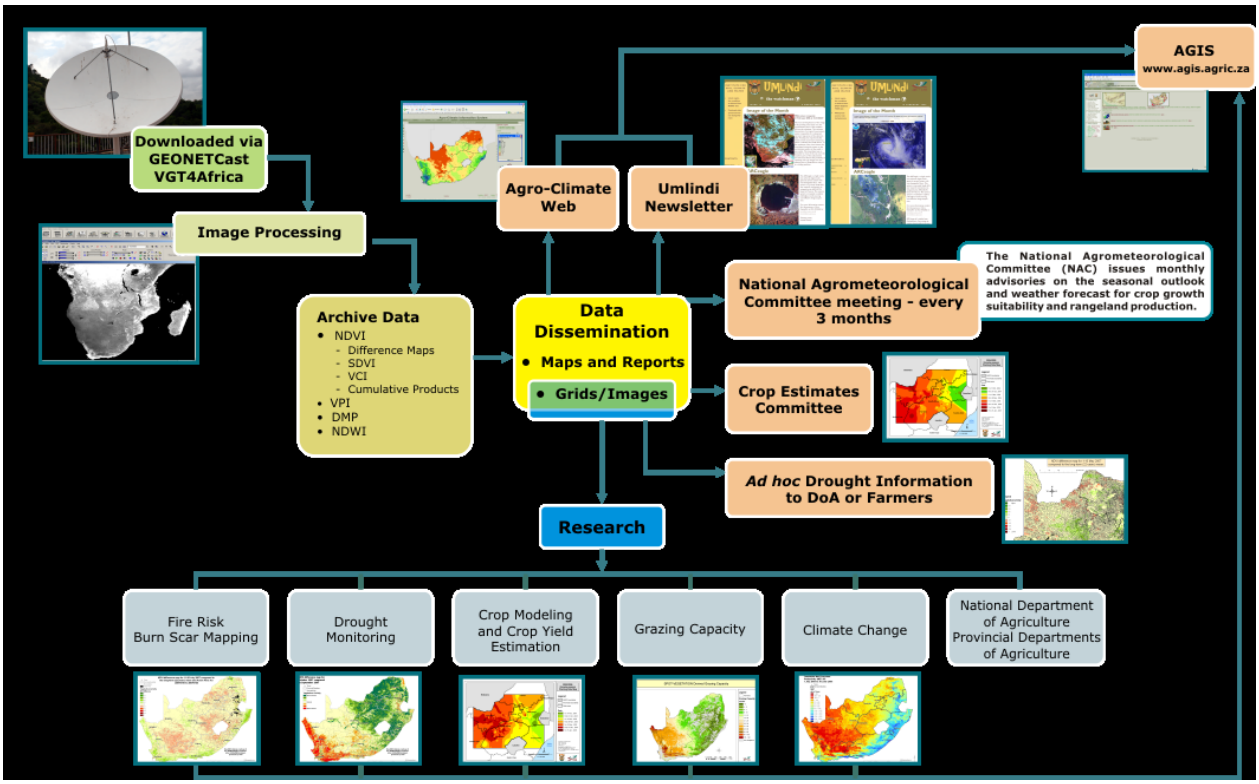

FIGURE 5: POTENTIAL USE OF SPATIAL DATA

3.2 PUBLIC AND PRIVATE PROBLEM STAKEHOLDERS AND INTERNATIONAL ORGANIZATIONS IN THE DOMAIN OF G4AW

The following stakeholder groups can benefit from potential solutions that are developed in the G4AW program:

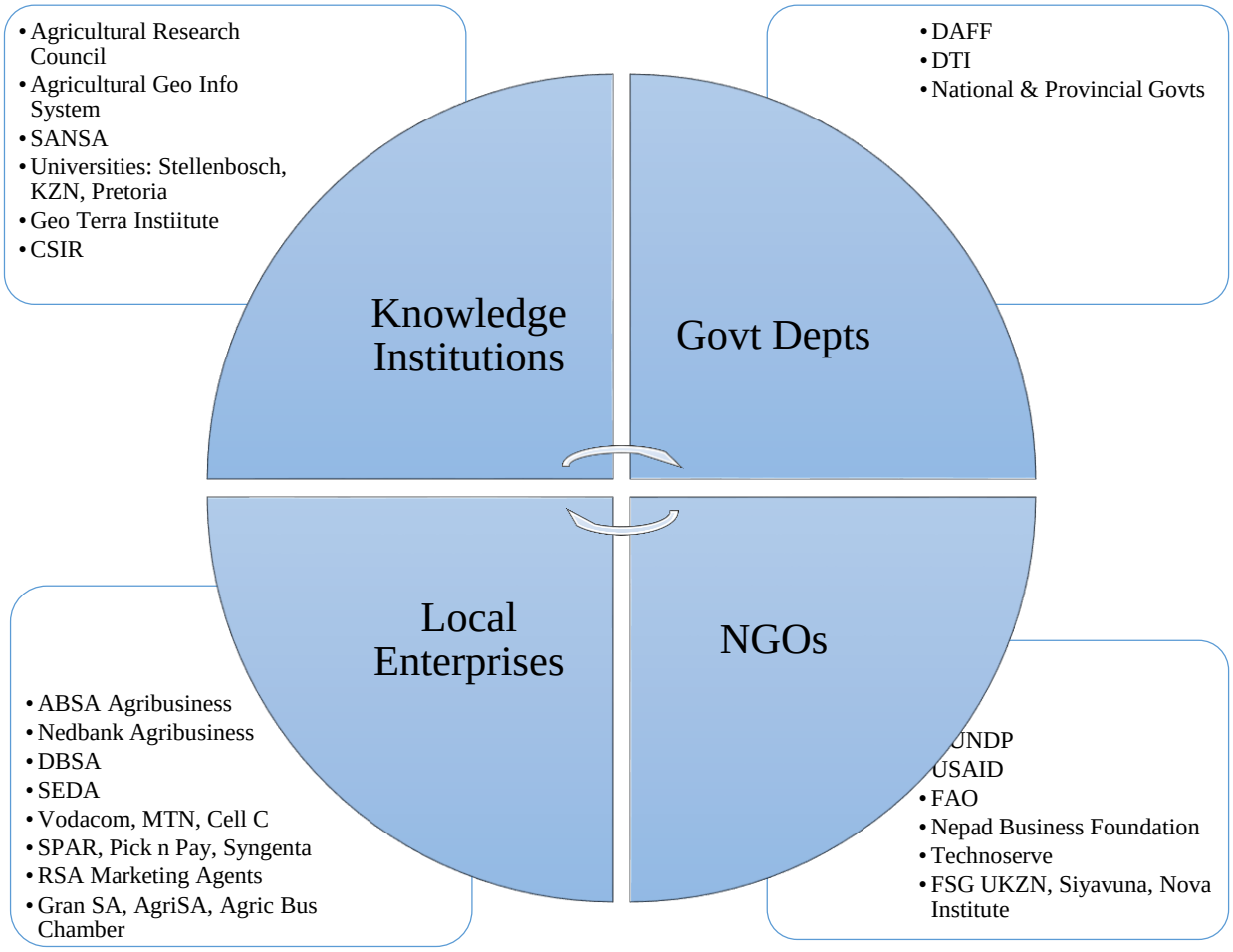

FIGURE 6: OVERVIEW OF STAKEHOLDERS

3.3 ONGOING G4AW RELEVANT ACTIVITIES AND/OR PROJECTS IN TARGET COUNTRY

Institution name	Institution type	Program name	Activity objective
FAO	Donor	FAO programmes predominantly deal with the provision of technical assistance to the relevant ministries and departments and are mainly funded from Government of South Africa sources	To develop policies, programmes and projects to reduce hunger and malnutrition; To help develop the agricultural, fisheries and forestry sectors to use their environmental and natural resources in a sustainable way.
FANRPAN	Development Agency / NGO Donor	Food, Agriculture and Natural Resources Policy Analysis Network(FANRPAN)	Is mandated to co-ordinate policy research and dialogue and recommend strategies for promoting food, agriculture and natural resources sectors in Africa by carrying out mutually agreed collaborative research and institutional development activities
ADB (African Development Bank)	Donor	Sustainable Land and Water Project	To strengthen capacity of communities to address inter-linked challenges of adverse impacts of climate change, rural poverty, food insecurity and land degradation
USAID	Donor	Platform for Agricultural Research and Technology Innovation (PARTI)	Develop and transfer improved agricultural technologies; strengthen capacity of agricultural research and technology transfer system

TABLE 5: PROGRAMMES EN ACTIVITY OBJECTIVES FOR G4AW

Ongoing agribusiness projects with possible link to G4AW

Effective advocacy and communication campaigns are being launched in South Africa targeting a broad spectrum of audiences. Relevant events being co-organized with partners are used as important platforms for advocacy, communication and fostering partnerships. The launch of 2014 Year of Agriculture and Food Security in Africa, marked 10th Anniversary of Comprehensive Africa Agriculture Development Programme (CAADP), during the January, 2014 AU Summit in Addis Ababa, Ethiopia. The 10th CAADP Partnership Platform Meeting held from 19th – 24th March, 2014 in Durban South Africa – organized by AUC and NPCA, which brought together Member States, key African Institutions and partners to review progress, and synthesize lessons for way forward. A Joint AU Conference of Ministers responsible for Agriculture, Fisheries and Aquaculture, and Rural Development held from 28th April – 2nd May, 2014 in Durban, South Africa, which deliberated on the theme and sub-themes and make resolutions for consideration by the AU Policy organs on agriculture and food Security.

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4 INVENTORY OF POTENTIAL (CHAIN) SOLUTIONS DIRECTIONS USING GEO-ICT IN LOCAL AGRICULTURE ISSUES

4.1 BASE SOLUTION DIRECTIONS IN SOUTH AFRICA TAILORED TO LOCAL AGRICULTURAL PRACTICES

4.1.1 ACTUAL AGRI-SPATIAL INFORMATION SERVICES

As indicated in Figure 2, South Africa is divided into several climatic zones each with an identifiable set of characteristics. Below is a diagrammatic outline of these features, challenges as well as the potential benefits obtainable from the use of geo-data in improving the agricultural production systems:

Climatic Zones Related Challenges & Geodata Importance			
Zone	Region	Agric Type	Challenges & Geodata Potential
Zone 1: Hot and Arid Conditions	North West, Northern Cape	Suitable for field crops,live stock,mixed farming	Climate change has lead to ***flactuating rainfall patterns*** and in some instances a pattern of ***droughts*** .Geodata provides these patterns and help reseachers and analysts to produce trends and rainfall forecasts.It is assumed that small hoilders farmers will use the information to adjust in their operations include changes in the planting dates of some crops, planting crops with a shorter growing period such as cabbage, and planting short season maize (120 days – 140 days). Others include the increased use of crop rotation and the early harvesting of some crops
			Hot temperatures caused by erratic climate change affects , livestock,if small holder farmers are aware of the coming heat they will be better prepared to plant trees to provide natural shades for their livestock or as a wind or hail storm break. In South Africa, farmers generally plant pine trees and Acacia karoo and Celtis africana trees for this purpose. In some instances, farmers use fishnets, grass, and plastics as coverings to protect their plants against dryness and heat, and cold and frost.
			If Geo data predicts ***cold fronts*** small holder farmers will be much prepared to provide heating to protect their animals against cold by by firewood and paraffin heaters.
			Soils,especially vertisols and xerosols,affects crops negatively and therefore may worsen any adverse climate effects on the crop farming sector. Having great depth of information through geodata will empower small holder farmers to be able to use the right type of fertilizers to alliviate the negative effects of climate.
Zone 2: Mediterranean	Westen Cape	Suitable for horticulture,mixed farming,grapes	As there is less and less rainflall,geodata would provide much needed information to small holder farmers to possibly Irrigate their crops to cushion against adverse climate effects by having a substitute for rainwater. There has also been increased use of wetlands for agricultural production.
Zone 5:Cool Subtropical	Eastern Cape	Suitable for forestry	Geodata would make it possible for small holder farmers to reduce the risk of losing income when farm produce decreases as a result of the increased variability in the climate, by insuring their produce.This calls for insurance companies to design insurance products to suit this cluster.
Zone 6:Warm Sub-tropical	KZN	Mainly sugar cane and livestock	With ***water being the most important factor limiting agriculture*** in South Africa, ***irrigation*** appears to be the most appropriate adaptive strategy. Small holder farmers may also built their own boreholes to make effective use of underground water.
			If Geodata predicts ***high temperatures*** , sugarcane farmers can shift to producing macadamia nuts and tea, which arae considered easier to irrigate than sugarcane.

TABLE 7: CLIMATIC ZONES RELATED TO CHALLENGES & GEO-DATA IMPORTANCE

4.1.2 Farm insurance and risk prevention strategies

The use of remote sensing in combination with local validated (by ground measurements) hydro-meteorological models help in anticipating near future water shortage/droughts and water excess situations. Public private Cooperation strategies between the agriculture sector and the local government / CMA Agencies and other sectors need to be developed (like financial/insurance or food and beverage, or other users of the same local water reservoirs like horticulture or industries/household/drinking water.

4.2 Differentiation of spatial solutions tailored to Agricultural practices/sector in South Africa

These differentiations are to be constructed in the specific workshop and matchmaking events in the coming period. When looking at the tables in section 4.1.1 for each spatial region and its local challenges, specific tailor-made geo information solutions need to be constructed. It is therefore not easy to differentiate in this section to various solution directions, which also have a clear sustainable base in terms of business. From partnership discussions and interactions demand driven solutions will pop up.

5 PARTNERSHIPS IN SOUTH AFRICA

In the following table potential solutions, divided by stakeholder groups, are listed:

Problem Stakeholders & Potential Solutions		
Stakeholder Group	**Potential Solution**	**Example**
Govt Depts	Agricultural advisories	NDA, DAFF
	Posting advisories in strategic public places	NDA, DAFF
	Weather observation and forecasting	NDA, DAFF
	Management of extreme weather and climate variability	NDA, DAFF
	Extension services offering two way communication with users	NDA, DAFF
Knowledge Institutions	Translating advisory into local languages	Universities
	Training of community station monitors	Geo Terra Inst
	Providing analyzed historical climate information to users	Geo Terra Inst, SANSA
	Enhances observation networks as a way to provide more relevant information	AGIS, SANSA
	Increase uptake of geo data information by demonstrating of its economic benefit	ARC
NGOs	Downscaling of climate information	FAO, NOVA
	Provision of ICT services	Technoserve
	Management advisories and farmer training	FSG, Siyavuna, NOVA
	Core production of knowledge and foundations to build on in up scaling climate services	
	Program funding	ICCO
Local Enterprises	Developing weather based agriculture financial and insurance products	Fin Institutions
	Provision of ICT services	ICT Co.s
	Provision of information services	ICT Co.s
	Transforming large scale meteorological information into locally relevant agro-advisories for farmer	Agri-SA Grain-SA
	Co-production of climate smart services	
	Improve risk management	
	Program funding	DBSA
	Funding small holder farmers	MAFISA, ITHALA

TABLE 6: POTENTIAL SOLUTIONS PER STAKEHOLDER GROUP

ANNEX 1 ACCESS TO FINANCE OF THE AGRICULTURAL SECTOR

The microfinance industry in South Africa is estimated to be R50 billion[15]. Studies have shown that only 6% is loaned to small businesses while the rest are consumer personal loans which are mainly used to buy food and to pay off old loans. Many small holder farmers are caught up in a seemingly endless cycle of borrowing often made worse by the desperate financial circumstances that the poor face. As a result consumers often approach "loan sharks" or "mashonisas" who are quick to advance loans and require little or no documentation which the more formal MFI's require. MFIs therefore need to build strong relationships with communities and build a reputation for efficiency in delivery of their services.

Currently the commercial agriculture sector usually has access to finance through commercial banks, but finance has not been easily available to new and smallholder farmers. This lack of finance places the burden on smallholder farmers who are not well-equipped to finance their operations.

Financial inclusion

Financial inclusion is a central aim of the banking sector, whereby the sector seeks to improve the range, quality and availability of financial services and products focusing on the un-served, underserved and financially excluded small holder farmers. Principles of financial inclusion include access, affordability, appropriateness, usage, quality, consumer financial education, innovation and diversification, and simplicity.

The introduction of the Banks Act (94 of 1990) led to an industry growth spurt with a number of new banking licences being issued. According to the latest World Economic Forum Competitive Survey 2012/13, SA banks are rated 2nd out of 144 countries for soundness, while the country was rated 3rd for financial sector development. Currently, the SA banking industry consists of 17 registered banks, 2 mutual banks, 12 local branches of foreign banks, and 41 foreign banks with approved local representative offices.

A number of initiatives launched by the financial sector are evidence of the banking industry's commitment to financial inclusion. The Financial Sector Charter (FSC) and the Black Economic Empowerment (BBBEE) Act have been the main pillars of transformation in the sector. Signed in 2003 and implemented in 2004, the FSC is a voluntary transformational charter for the financial sector.

Micro Agricultural Financial Institution (MAFISA)[16]:

The Micro Agricultural Financial Institution of South Africa (MAFISA) was established in 2004 by the Department of Agriculture, Forestry and Fisheries. The main purpose is to facilitate the provision of equitable and large-scale access to financial services by economically active rural poor communities and smallholder farmers on an affordable, diversified and sustainable basis. To date the institution has disbursed R320 million worth of loans to 22,000 beneficiaries through retail financial institutions. MAFISA aims to effectively contribute to poverty reduction and job creation through the provision of credit facilities to smallholder farmers.

The six major sources of credit for farmers are banks (50%), agricultural co-operatives and Agribusinesses (12%), the Land and Agricultural Development Bank of South Africa (the Land Bank) (21%), private creditors (8%), other

[15] Source: http://www.kpmg.com/za/en/issuesandinsights/articlespublications/financial-services/pages/microfinance-and-poverty-alleviation-in-south-africa.aspx

[16] Source: http://www.bankseta.org.za/downloads/BANKSETA_Microfinance_Review_Report_2013.pdf

creditors and financial institutions (9%), and the state (1%). South Africa has a diverse financial system catering for both commercial and small holder farmers albeit red tape on Small holder farmers.

Small Holder Funders

CAPITAL HARVEST (Pty) Ltd	Capital Harvest provides a range of financial products including term loans, hire purchase agreements, and production loans to small and medium agriculture clients in the primary and secondary sector. Although not a registered bank, all processes and structures are based on banking best practice ;including a "asset-based risk grading model developed specifically for the agriculture sector
LAND BANK 1912 – 2012	The Land Bank is mandated to provide financial services to the agricultural sector and is now structured into three divisions, which caters for the corporate agricultural sector -Retail to commercial banking and Retail Emerging _markets .The bank has 27 branches
IDC Industrial Development Corporation	The IDC's objective is to support industrial capacity development through providing risk capital; industrial finance or project finance. The IDC's regional mandate includes South Africa and the rest of Africa since 1998. The total value of the IDC is equity base is R93 billion. The IDC has an active portfolio of R8.4 billion invested in South African companies.
DBSA Development Bank of Southern Africa	The Development Bank of Southern Africa (DBSA) contributes to development by mobilising financial knowledge and human capital to support public and other Development institutions. The bank plays a direct role in financing and implementing infrastructure development projects in rural areas.
Ithala DEVELOPMENT FINANCE CORPORATION	Ithala Development Finance Corporation is KwaZulu-Natal's provincial development agency. It has three major wholly owned subsidiaries; Ithala Limited (investments, insurance products, personal and home loan products),the KZN Growth Fund Managers (investment in infrastructure in KwaZulu-Natal) and Ubiciko Twines and Fabrics (Pty) Ltd. Ithala Development Finance Corporation's mandate is to promote development within KwaZulu-Natal and to increase the participation of black people in all sectors of the economy. It is 52 years old and only operates in KwaZulu-Natal.
Casidra	Cape Agency for Sustainable Integrated Development in Rural Areas (Casidra) is a wholly owned implementing agency of the Western Cape Provincial Government that works closely with the province's Department of Agriculture, which provides its funding. The main focus of the Casidra's activities is integrated rural development inpoor rural communities of the Western Cape.

TABLE 8: SMALL HOLDER FUNDERS

Strategic Objectives

Facilitate balanced geographic distribution of rural finance capacity and flow according to demand distribution.

Increase outreach by stimulating expansion of existing retail lending entities or creation of new retail lending capacity in rural areas through appropriate support.

Provide efficient and effective agency services to government for the management of government initiated programmes.

Limited access to finance

Banks are generally reluctant to lend money to new and smallholder farmers in domestic food production. This seems to be for the following reasons:

These smallholder farmers are mainly within the informal sector, often keep no written records, have limited resources and have little contact with the banking system.

Lending to smallholder farmers involves significant risks because of the difficulties of accurately forecasting price movements and because of the deterioration of the produce due to lack of proper storage facilities.

Much of the policy environment surrounding banks appears to encourage conservatism and discourage the development of new lending instruments. Liquidity controls, imposed as a result of structural adjustment and the high level of interest which banks can obtain on treasury bonds, diminish their interest in finding new private sector clientele.

The government will design a suitable financing programme that will strive to support smallholder farmers and land and agrarian reform beneficiaries in their marketing needs and requirements.

Farmers Require Four Kinds of Financial Services

Credit in the form of loans, personal loans, salary loans, overdraft facilities, or credit lines, is often used as working capital at the beginning of the growing season to purchase inputs and prepare land. They also need capital to invest in equipment such as tractors or drip irrigation and to harvest, process, market, and transport their produce. It is important to distinguish between short-term loans, which microfinance institutions usually provide, and the long-term financial services required for agricultural and livestock enterprises.

Savings may be in the form of current accounts, savings accounts, or fixed or time deposits. Famers have a significant need for savings, because their income is seasonally tied to the harvest, and for much of the year they rely on savings to smooth consumption.

Transfer and payment facilities allow for local and international money transfers, remittances, government transfers, and check clearing.

Insurance may cover crops and livestock as well as human life and health.

Source: Author, based on CGAP and IFAD 2006:6 and Nair and Fissha 2010.