

**Strategic Analysis and Knowledge  
Support System for Southern Africa  
(SAKSS-SA)**

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**Inventory of Sources of  
Geospatial Information  
In Support of Strategic Analysis  
and Knowledge Management  
Concerning Poverty and  
Agricultural Growth**

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**SAKSS-SA Working Paper No. 2**

September 2006

**International Crops Research Institute  
for the Semi-Arid Tropics (ICRISAT)  
and  
International Water Management Institute (IWMI)**



# FOREWORD

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The Strategic Analysis and Knowledge Support System (SAKSS) targets the identification and assessment of strategies for agricultural growth in Africa, particularly those contributing most to alleviating poverty. The programme has two main components:

- ▶ a strategic analysis initiative targeting improvements in agricultural policy and investment decision-making; and
- ▶ a knowledge support system that endeavours to improve access to, and the use of, higher-quality data in this policy analysis.

SAKSS-SA is one of three regionally focused programmes for the implementation of SAKSS in Africa. Based in Southern Africa, this programme is being initiated jointly by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Water Management Institute (IWMI), in collaboration with a growing list of national and regional partners. Related SAKSS programmes are being implemented in East and West Africa. In East Africa it is under the leadership of the International Livestock Research Institute (ILRI), and in West Africa it is led by the International Institute for Tropical Agriculture (IITA). The International Food Policy Research Institute (IFPRI) is providing strong technical support to each of these regional SAKSS programmes.

This is the second issue in a SAKSS-SA working paper series summarising SAKSS outputs. This series aims to inform policy-makers about alternative strategies for linking agricultural growth and poverty alleviation. It also aims to strengthen a growing community of practitioners involved in such analyses.

SAKSS-SA's second working paper is an effort to identify institutions providing geospatial information that would support strategic analyses and knowledge on poverty alleviation and agricultural growth in Southern Africa. This paper summarises the inventory compiled in the study. Such listings are inevitably incomplete; they evolve over time. SAKSS-SA itself aims to revise this listing as new information becomes available. We anticipate that this inventory will be useful, nonetheless, in encouraging strengthened collaboration.

Feedback on this document is most welcome, and should be sent to the SAKSS-SA Coordinator:

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## **INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)**

ICRISAT's mandate is to improve the livelihoods of the poor in semi-arid crop-livestock-tree production systems through integrated genetic and natural resource management strategies. ICRISAT research will make major food/feed crops more productive, nutritious, and affordable to the poor; diversify utilization options for staple food crops; develop tools and techniques to manage risk and more sustainably utilize the natural resource base of semi-arid tropical production systems; and identify ways to strengthen delivery systems and to diversify income sources for the population. ICRISAT's strategic focus is in the semi-arid tropics.

<http://www.icrisat.org/>

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## **INTERNATIONAL WATER MANAGEMENT INSTITUTE (IWMI)**

IWMI is a non-profit scientific organization funded by the Consultative Group on International Agricultural Research (CGIAR). IWMI's research agenda is organized around four priority themes covering key issues relating to land, water, livelihoods, health and environment. The Institute concentrates on water and related land management challenges faced by poor rural communities. The challenges are those that affect their nutrition, livelihoods and health, as well as the integrity of environmental services on which these depend. IWMI works through collaborative research with partners in the North and South, to develop tools and practices to help developing countries eradicate poverty and better manage their water and land resources. The immediate target groups of IWMI's research include the scientific community, policy-makers, project implementers and individual farmers.

<http://www.iwmi.cgiar.org/>

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## **THIS REPORT WAS COMPILED BY**

### **ENVIRONMENTAL INFORMATION SYSTEMS AFRICA (EIS-AFRICA)**

The creation of EIS-AFRICA consolidates ten years of investment and capacity-building efforts in Environmental Information Systems (EIS) in sub-Saharan Africa into an Africa-wide organisation promoting the greater use of harmonised geo-spatial information. EIS-AFRICA is a non-profit pan-African organisation of geo-information practitioners and institutions. It is based in Pretoria, South Africa, and is incorporated as an association under Section 21 of the South African Companies Act (Act 61, 1973). EIS-AFRICA is recognised by our strategic partners, clients and the public as a leading organisation developing African capacity to generate, manage, disseminate and use geo-spatial and environmental information to enrich policy debate and support decision-making for the well-being of African people.

<http://www.eis-africa.org/EIS-Africa/>

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# LIST OF ACRONYMS

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CODI GEO	Committee on Development Information Working Group on Geographic Information
EASD	Empowerment for African Sustainable Development
EIS-AFRICA	Environmental Information Systems Africa
ESRI	Environmental Systems Research Institute
FANR	Food and Natural Resource Unit
FAO	Food and Agriculture Organisation of the United Nations
FCZ	Forestry Company of Zimbabwe
FEWS NET	Famine Early Warning Systems Network
FGDC	Federal Geographic Data Committee
GIMS	Geographic Information Management System
GIS	Geographic Information System
GPS	Global Positioning System
GISD	Geographic Information for Sustainable Development
GSN	Geological Survey of Namibia
GSDI	Global Spatial Data Infrastructure
HSRC	Human Sciences Research Council
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics – Southern Africa
IDEAA	Initiative for Development and Equality in Agriculture
IFAD	International Fund for Agricultural Development
IWMI	International Water Management Institute
MAFA	Mapping Africa for Africa
MDG	Millennium Development Goal
NICI	National Information Communication Infrastructure
NGO	non-governmental organisation
NSDC	National Spatial Data Centre
OCHA	UN Office for the Coordination of Humanitarian Affairs
R-VAC	Regional – Vulnerability Assessment Committee
SAC	Satellite Applications Centre
SAHIMS	Southern African Humanitarian Information Management Network
SADC	Southern African Development Community
SADC-RRSU	SADC Regional Remote Sensing Unit
SAKSS	Strategic Analysis and Knowledge Support System
SDI	Spatial Data Infrastructure
SIRDC	Scientific and Industrial Research and Development Centre – Environment and Remote Sensing Institute (Zimbabwe)
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environmental Programme
USAID	United States Agency for International Development
USGS	United States Geological Survey
VAA	Vulnerability Assessment and Analysis
VACs	Vulnerability Assessment Committees
WFP	World Food Programme
WHO	World Health Organisation
WMF	Web Map Service
WRI	World Resources Institute
WWF	World Wildlife Fund







# INTRODUCTION

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The challenge for Africa's development is enormous. With approximately half of its population living below the international poverty line and one-third of its population undernourished, sub-Saharan Africa requires fast and sustained economic growth. The need is particularly urgent in the rural sector, where approximately 75% of Africa's poor live, and where livelihoods are dominated by agricultural and non-farm activities. The global Millennium Development Goals (MDGs) have refocused attention on the persistence of this poverty.

The Strategic Analysis and Knowledge Support System (SAKSS) targets the identification and assessment of strategies for agricultural growth in Africa, particularly those contributing most to the alleviation of poverty. One mechanism to achieve this goal is the development of a knowledge support system that improves access to, and the use of higher-quality data in policy analysis.

The priorities for the SAKSS programme in Southern Africa are evolving in response to the articulated needs of regional and national stakeholders. The quality of analysis pursued in this community and the impacts of this work depend on the strength of the underlying information system. SAKSS-SA therefore encompasses two important components:

1. It provides a portal to key international datasets important for national and regional policy making, with internet links and examples of how the data may be applied to policy analysis.
2. It promotes broader sharing of primary datasets collected by analysts in the region. This includes an extensive array of farm survey data that offers the possibility of measuring rural income and poverty trends.

The primary measure of the value of SAKSS-SA lies in how policy-makers use the information and analysis generated. The capabilities developed through this programme will ultimately help governments and donors to assess how their development programmes can more effectively contribute to meeting the Millennium Development Goal of reducing the proportion of people living in hunger and poverty by 50% by the year 2015.

SAKSS-SA commissioned Environmental Information Systems Africa (EIS-AFRICA) to conduct an inventory of institutions holding geographical information of relevance to poverty analysis and agricultural development in Southern Africa. The purpose of this inventory is to create the basis for a database of such institutions and their data holdings with a view to facilitating access to these data. The inventory only covers member states of the Southern African Development Community (SADC). As the inventory may not have covered all the relevant institutions, SAKSS-SA will continue to update the listing as new information becomes available.

# STUDY OBJECTIVE

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The main objective of this study is to support the development of the knowledge support system described above through the compilation of an inventory of spatial or geo-information for the Southern African sub-region. This geo-information inventory report follows two other projects commissioned by the International Water Management Institute (IWMI):

- ▶ Inventory of Institutions involved in Poverty Analysis in the Rural Agricultural Sector.
- ▶ A review of institutions involved in analyses of agricultural growth strategies in Southern Africa.

The findings and recommendations of this report will serve to strengthen the Strategic Analysis and Knowledge Support System Network for Southern Africa (SAKSS-SA).

Geo-information is seen as a key component in building a knowledge base to support poverty alleviation and sustainable development, and to meet the Millennium Development Goals (MDGs) for Africa.

Over the past decades, geospatial information has become recognised as a fundamental component of the decision-making process. It is argued that 80% of all information has a spatial context. Decision-makers increasingly understand that the question of “Where?” is often most important in addressing service delivery and poverty alleviation, and in working to solve Africa’s problems, one is often faced with the questions of where the poor are, where the infrastructure is, where the natural resources are, where resources would best be placed, etc.

Geo-information could be described as spatially referenced information that can be presented as maps (digital, graphic and/or paper) and text/thematic information. The tradition has been to collect baseline data (topography, cadastre, satellite imagery and digital terrain models) through techniques such as land surveys and aerial photography, and to produce paper maps. More recently this information has been captured on the Geographic Information System (GIS), defined as a collection of computer hardware, software and geographic data for capturing, managing, analysing and displaying all forms of geographically referenced information (<http://www.-gis.com/whatisgis/index.html>, 2006).

In the simplest terms, a GIS is a computer-based Relational Database Management System (RDMS) (geo-database). The GIS database’s uniqueness can be attributed to its ability to work with location, i.e. latitudes, longitudes and height (X, Y, Z axes respectively), and allow relationships between points, lines and polygons that represent real phenomena on the earth to be measured (geo-processing) and displayed graphically (geo-visualisation). Today digital maps are widely available on the internet.

Stated differently, a GIS can link information (attributes) to location data, such as people to addresses, buildings to parcels, or streets within a network. This information can then be overlaid to give you a better understanding of how it all works together. You choose what layers to combine based on what questions you need to answer. Depending on the area of application, additional data can be linked to the spatial database. This can include Global Positioning System (GPS) points, and socio-economic, demographic, hydrographical, poverty, health, etc. data. Only when these datasets are geo-coded (location information attached to attributes) and integrated within a GIS can we refer to this body of information as geospatially referenced information or geo-information. With this information, a GIS analyst can run scripts to carry out modelling and mapping routines.

The GIS facilitates integration of data and information from different sectors and sources to provide a comprehensive picture of the geographical distribution of phenomena in the area of study. The GIS can help with visualising where major problems and gaps in information exist, and thus can alert planners, donor agencies and ultimately policy-makers to any need for additional data collection.

The GIS has introduced new ways of handling information. There are new methods and procedures for displaying and disseminating maps, charts, spreadsheets and metadata (data about data).

The Spatial Data Infrastructure (SDI) initiative, which promotes the production, use, access, documentation of metadata and sharing of geospatial information for sustainable development, has facilitated the drive that has seen African agencies such as the United Nations Economic Commission for Africa (UNECA) and EIS-AFRICA facilitate the development of an African SDI. The SDI promotes data sharing and exchange through the application of internationally accepted standards. The SADC Regional Remote Sensing Unit based in Botswana was mandated to support the development of the Southern African SDI. Once this key regional organisation is fully operational, it will provide linkages to the network of agencies, producing and serving geo-information within SADC that will be easily accessible to a variety of users, and more importantly, to key decision-makers.

The next section of this report will briefly describe the methodology undertaken in conducting this study.

# STUDY METHODOLOGY

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The inventory of geospatial data was undertaken with the aim of identifying institutions and organisations that have relevant geospatial data holdings within the Southern African Development Community (SADC) sub-region to support the SAKSS-SA objectives and development of the SAKSS-SA knowledge base. The compiled inventory had to list relevant and electronically accessible geospatial information, describe the datasets and provide links to them.

The following activities were carried out to meet the terms of reference for this study.

First, geospatial data links of the established networks, such as those of EIS-AFRICA, UNEP, UNECA, SADC-RRSU and the FGDC, were investigated. This investigation was followed by an extensive internet search. Finally, organisations were contacted by email and/or telephone, with a view to drawing up a profile for each organisation. The study considered geospatial data holdings of the 14 SADC member states only, this being the geographic area that SAKSS-SA is mandated to support (Map 1).

The following thematic areas were considered important for the study:

1. Thematic baseline data (foundation layers)
2. Poverty and livelihoods
3. Population, demography and health
4. Economy and markets
5. Social and political conditions
6. Agriculture
7. Biophysics (especially land and water) and climate
8. Remote sensing (including imagery)

## SOUTHERN AFRICAN COUNTRIES SURVEYED



# SOUTHERN AFRICAN GEOSPATIAL INFORMATION RESOURCES

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Annex 2 of this report provides an inventory of international/regional/sub-regional and national institutions or agencies holding geospatial datasets for the Southern African Development Community (SADC), and describes the specific datasets of over 100 of those holding geospatial information of specific relevance to SADC. The next section briefly describes a selection of key agencies and the data they offer.

## KEY INTERNATIONAL AND REGIONAL AGENCIES

Most of the agencies described in this section provide web access to their spatial information.

### 1. SADC Regional Remote Sensing Unit (RRSU)

Post: **SADC-RRSU, P/Bag 0095, Gaborone, Botswana**  
Phone: **267-3951863**  
Fax: **267-3924099**  
Email: [rrsu@sadc.int](mailto:rrsu@sadc.int)  
Website: <http://www.sadc.int/geonetwork>  
Contact Person: **Dr K. Masamvu**

#### Description

The RRSU is a centre of technical expertise facilitating training programmes and technical support in the fields of Remote Sensing, Agro-meteorology and GIS in support of early warning for food security and natural resource management. The RRSU maintains a database of freely available remotely sensed and vector datasets of SADC countries.

#### Geographical coverage

Datasets cover all of SADC and some cover the whole of Africa.

#### Data holdings

Provides data mainly for food security analysis. Also hosts and distributes LandSat imagery for free.

#### Rules of access

Most data is distributed free of charge; some is distributed on a cost-recovery basis.

#### Selected publications

The Food, Agriculture and Natural Resources (FANR) Directorate has published several articles on land and water management, food security and vulnerability.

### 2. Southern African Humanitarian Information Management Service (SAHIMS)

Street: **MERAFE House, 11 Naivasha Rd, Sunninghill, Johannesburg, South Africa**  
Post: **SAHIMS, P/Bag X44, Sunninghill 2157, Johannesburg, South Africa**  
Phone: **27-11- 5171568**  
Fax: **27-11- 5171690**  
Email: [gtadonki@sahims.net](mailto:gtadonki@sahims.net) / [secretariat@sahims.net](mailto:secretariat@sahims.net)  
Website: <http://www.sahims.net> / [http://www.sahims.net/gis/Gis%20Input/GIS\\_library\\_Regional.asp](http://www.sahims.net/gis/Gis%20Input/GIS_library_Regional.asp)  
Contact person: **Dr Georges Tadonki**

## **Description**

SAHIMS.NET is the web portal of the Southern Africa Humanitarian Information Management Network initiative, an integral part of the UN regional disaster response capacity and a project of the UN Office for the Coordination of Humanitarian Affairs (OCHA), which aims to improve and widen the knowledge base of humanitarian operations in the region, and promotes quality information products and services that improve access to humanitarian information resources in the region. SAHIMS supports data and knowledge sharing among humanitarian actors and promotes best practices. The helpdesk facility provides technical assistance in the various areas of information management for humanitarian programming, but also responds to information support requests from national disaster management agencies, UN agencies and implementing partners.

SAHIMS.NET is a comprehensive information tool: available, database-driven, dynamic, user-friendly and interactive. From any location, humanitarian users with internet access are able to update, search for and download information that meets their needs. In areas without the infrastructure for web use, users are served by traditional dissemination means such as CD-Rom and printed material. A significant amount of data exists in Southern Africa, and it is commonly agreed that there is a need for a more widely accessible information base in support of disaster response in the region.

The website is a platform for country humanitarian teams to highlight their work and to develop and maintain critical partnerships. SAHIMS.NET regularly publishes well-documented and focused humanitarian information briefcases, with details on organisational meetings and other events that have an impact. SAHIMS.NET also provides an online library giving access to key institutional and research reference material as well as GIS datasets to assist with programming.

The SAHIMS.NET website continues to gain recognition as a regional repository of relevant data, combining availability, affordability and data support services not often available at SADC country level. This repository has significantly improved the flow of information relating to vulnerability, preparedness and response.

Geographic information is important for managing and planning for emergency preparedness and response, and tackling any other challenges facing societies in Southern Africa. The SAHIMS GIS data server offers easily accessible standardised data provided by UN, non-governmental and governmental agencies, and the datasets are downloadable free of charge. They can be viewed and manipulated using standard GIS software. Metadata is attached to enhance users' understanding of data sources, applications and copyright.

## **Geographical coverage**

Offers a wide variety of GIS data for almost all SADC countries at both regional and national level.

## **Data holdings**

Data varies from regional to national. Datasets include: national, municipal and administrative boundaries; national power lines; health facilities; regional climatic data; regional boundaries; vulnerability, emergency operation and assessment; etc.

## **Rules of access**

Datasets in this catalogue are downloadable free of charge. The data can be viewed and manipulated using standard GIS software. Metadata is attached to enhance users' understanding of data sources, applications and copyright.

## **Selected publications**

SAHIMS offers an extensive compilation of essential reports and documentation on various humanitarian and disaster management issues, including the following:

- ▶ 07/06 – Food Insecurity Appeal No. 05EA023 (IFRC)
- ▶ 07/06 – Views on Migration in Sub-Saharan Africa (HSRC)
- ▶ 07/06 – Humanitarian Action Report 2006: Mid-term Review (UNICEF)
- ▶ 05/06 – Progress for Children (UNICEF)
- ▶ 05/06 – UNICEF Annual Report 2005 (UNICEF)
- ▶ 2005 – Looking for Equality (UNDP)
- ▶ 03/06 – Progress on Global Access to HIV Antiretroviral Therapy (WHO & UNAIDS)

- ▶ 05/06 – Report on the Global AIDS Epidemic: Executive Summary (UNAIDS)
- ▶ 12/02 – HIV/AIDS and Food Insecurity in Southern Africa (Oxfam & Save the Children)
- ▶ 08/04 – Regional Workshop for the Implementation of the SADC HIV & AIDS Strategic Framework (SADC)

### 3. United Nations Food and Agriculture Organisation (FAO)

The FAO is a specialised United Nations agency with an international mandate to raise levels of nutrition, improve agricultural productivity, better the lives of rural populations and enhance the contribution of agriculture to economic development. The FAO regularly collects, analyses, interprets and disseminates information relating to nutrition, food and agriculture. In addition to FAOSTAT, a national-level public domain database, FAO is actively involved in the collection of sub-national datasets that could be used in the analysis of agricultural growth opportunities and linkages of investment in agriculture and poverty reduction. The descriptions below illustrate the work done by the FAO.

#### 3.1 Global Information and Early Warning System (GIEWS)

Post: **GIEWS, FAO Commodities and Trade Division, Viale delle Terme di Caracalla, 00100, Rome, Italy**  
 Phone: **39-06-57053099**  
 Fax: **39-06-57054495**  
 Email: **giews1@fao.org**  
 Website: **<http://www.fao.org/giews/english/index.htm>**

##### Description

The GIEWS is intended: (a) to monitor food supply and demand in all countries of the world on a continuous basis; (b) to compile and analyse information on global production, stocks, trade and food aid; and (c) to monitor export prices and developments on main grain exchanges. The system objective is to provide policy-makers and policy analysts with the most up-to-date and accurate information available on all aspects of food supply and demand. In doing this, the GIEWS provides regular bulletins on food crop production and markets at global level, and reports on a regional and country-by-country basis.

The GIEWS Workstation (<http://www.fao.org/giews/workstation/>) is a geographical (GIS) and web-based information system managing remote sensing, GIS, database and text data at both global and country level. It is designed to assist in storing and accessing information in consistent and standardised ways. It is also intended to be an analytical tool availing data and applications to display and process data for early warning and food security analysis.

The GIEWS Workstation permits the user to:

- ▶ get information organised in a structure compatible with other national databases;
- ▶ allow non-specialised users to access (and manage) recent and historical food security and early warning information through the internet;
- ▶ perform data analysis and database queries in a simple way;
- ▶ easily share information with partners and internal/external users; and
- ▶ improve their reports using the information (tables, charts, maps, news, reports)

##### Geographical coverage

Global coverage available at various scales, and there are several datasets for Southern Africa.

##### Data holdings

The GIEWS is collaborating with the World Food Programme (WFP) in a data collecting exercise for selected African countries, including three countries of interest to SAKSS-SA, i.e. Malawi, Mozambique and Zimbabwe. This data could be made available to SAKSS-SA on request. The data elements are:

- ▶ Agricultural production
- ▶ Livestock production
- ▶ Prices
- ▶ Trade
- ▶ Human Development Indicators

- ▶ Household income
- ▶ Health/nutritional status

Other relevant data, as jointly agreed upon by FAO/GIEWS and the World Food Programme (WFP), is available at sub-national level, examples being kcal availability, staple food, livestock import/export (amounts and value) and food aid.

### **Rules of access**

The GIEWS Workstation is easily accessible online at no cost.

### **Selected publications**

No specific publications are available, but recent news items produced by the FAO Economic and Social Department can be accessed at [http://www.fao.org/es/english/index\\_en.htm](http://www.fao.org/es/english/index_en.htm).

## **3.2 Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS)**

Email: [FIVIMS-Secretariat@fao.org](mailto:FIVIMS-Secretariat@fao.org)

Website: <http://www.fivims.net/>

### **Description**

The Inter-Agency Working Group on Food Insecurity and Vulnerability Mapping Systems oversees the development of FIVIMS, while a permanent secretariat of the FAO manages the process. The FIVIMS objective is to improve understanding of food insecurity and vulnerability by means of improved data and information systems. The work entails assembling, analysing and disseminating information on who and where the food-insecure and vulnerable people are, why they are food-insecure and vulnerable, and what could be done to assist them. Such an understanding will bring about better targeting of interventions and efforts to reduce the number of undernourished people and achieve food security for all through investment in agriculture and rural development.

FIVIMS provide a framework within which a wide range of activities are carried out at national and international level in support of improved information. At national level FIVIMS are implemented through a network of information systems that gather and analyse data relevant for measuring and monitoring food insecurity and vulnerability. This network is referred to as the national FIVIMS. At international level the FIVIMS are implemented through a diverse programme of activities aimed at supporting national FIVIMS and establishing a common database and information exchange network referred to as the global FIVIMS.

In Southern Africa FIVIMS work with the Regional Vulnerability Assessment Committee (RVAC), which essentially is the Southern African FIVIMS, while the national VACs correspond to the national FIVIMS. Each country in Southern Africa has a National Vulnerability Assessment Committee (NVAC) focal point. The principal contacts for vulnerability analysis in this region are presented in the table below.

### **Geographical coverage**

Data for most of Southern Africa is available at national and sub-national level.

### **Data holdings**

The FIVIMS have identified 15 information domains as relevant to the agreed Conceptual Framework for Understanding the Causes of Low Food Consumption and Poor Nutritional Status. At national level the variables and data may differ to those at national and sub-national level. In general, the data-collection domains of the FIVIMS are as follows:

- ▶ Demographic conditions
- ▶ Economic conditions
- ▶ Environmental conditions and natural resources
- ▶ Political conditions
- ▶ Social and cultural indicators
- ▶ Risks, hazards and shocks
- ▶ Food availability
- ▶ Stability of food supplies and access



- ▶ Care and feeding practices
- ▶ Household characteristics
- ▶ Health and sanitation
- ▶ Food consumption levels
- ▶ Health status
- ▶ Nutritional status

### Rules of access

The data being collected by the FIVIMS network can be obtained directly from network members or through the SADC RVAC. Data is downloadable free of charge through the FAO Geo-Network.

### Selected publications:

- ▶ FIVIMS Newsletter
- ▶ FIVIMS Guidelines
- ▶ IAWG-FIVIMS Working Paper Series
- ▶ The State of Food Insecurity in the World Report 2005
- ▶ Nutrition Country Profiles 2005

## 3.3 FAO Land and Water Development Division (Agro-Maps: Mapping of Agricultural Production Systems)

Email: [martin.ager@fao.org](mailto:martin.ager@fao.org) or [sourakata.bangoura@fao.org](mailto:sourakata.bangoura@fao.org)

Website: <http://www.fao.org/ag/agl/default.stm>

Contact persons: **Martin Ager**, Sub-Regional Office for Southern and East Africa, Harare, Zimbabwe  
**Sourakata Bangoura**, Sub-Regional Office for Southern and East Africa, Harare

### Description

The FAO Land and Water Development Division is concerned with the development of technology, strategy and policy, and the provision of advisory and technical services to FAO members to ensure a more productive and efficient use of land and water resources and plant nutrients so as to meet present and future food and agriculture demands on a sustainable basis.

Agro-MAPS, one resource of the Division, is a spatial database of agricultural land-use statistics aggregated by sub-national level that permits a global overview of crop production statistics and their spatial variation at sub-national level. This database contains data for primary crops as defined by FAOSTAT (<http://faostat.fao.org>), including cassava, maize, potatoes, wheat, sorghum, millet, rice, wheat, etc. The variables collected are:

- ▶ area harvested (hectares);
- ▶ crop production (metric tonnes); and
- ▶ yield (metric tonnes/hectare).

Agro-MAPS data is aggregated at sub-national level for selected years with an emphasis on compiling the most recent data available. The coverage is global, with data for 134 countries, with data at the first administrative level for 130 countries and at the second administrative level for 59 countries.

Special features of the data include:

- i) non-standard crop names and statistics descriptions standardised by FAO unique identifier codes;
- ii) conversion, when necessary, of data on production, area harvested and yield to standardised reporting units (metric tonnes, hectare, and metric tonnes per hectare respectively); and
- iii) adjustment to the reported year to facilitate subsequent comparisons between the sub-national and national aggregated FAOSTAT statistics.

To facilitate browsing of the data in map form, the tabular data has been linked to geographic maps of the administrative units. This linkage process necessitated the unique identification of each administrative district in the geographic map and the available tables. Each statistic reported in Agro-MAPS is assigned the unique identification code associated with spatial administrative units. Agro-MAPS uses the SALB coding scheme.

## Geographical coverage and Data holdings

The table below presents an inventory of the data for Southern Africa contained in Agro-MAPS, indicating that this data requires an update.

Country	Year	Admin. Level	Crops
Angola		1	maize
Botswana	1993	1	sunflower seed, sorghum, millet, maize, groundnuts in shell, beans
Congo, DR	1994-96	1	yams, wheat taro (coco yam), sweet potatoes, soybeans, rice, paddy potatoes, plantains, millet, maize, groundnuts in shell, cow peas, dry cassava beans, dry bananas bambara beans
Lesotho	1190, 94, 97	1	wheat, sorghum, peas, dry maize beans
Madagascar	1993-97	1	sweet potatoes, sugar cane, rice paddy, potatoes, pepper, white/long/black peas, dry maize groundnuts in shell, coffee, green cassava beans
Malawi	1989-99	2	tobacco leaves, sweet potatoes, sorghum, rice paddy, pulses, millet, maize, groundnuts in shell, cassava beans
Mauritius	1996-2000	1	tomatoes, potatoes, pineapples, onions, dry maize, groundnuts in shell, cabbages, bananas
Mozambique	1994-2000	2	rice paddy, maize, cassava beans
Namibia	1995	1	wheat, sorghum, millet, maize, groundnuts in shell, cow peas, dry beans
Tanzania	1992-98	1	wheat, sorghum, rice paddy, millet, maize, cassava beans
South Africa	1990-98		beans, groundnuts in shell, maize, sorghum, wheat
Swaziland	1994/2000	1	tobacco leaves, sweet potatoes, sunflower seed, sugar cane, soybeans, sorghum, sesame seed, cotton, pumpkin, squash, gourds, potatoes, maize, groundnuts in shell, cow peas, dry cassava beans, dry bambara beans
Zambia	1991	1	wheat, sunflower seed, soybeans, sorghum, seed cotton, rice paddy, millet, maize, groundnuts in shell, cassava beans,
Zimbabwe	1994	1	sunflower seed, sorghum, seed cotton, maize, groundnuts in shell

With the exception of South Africa, Malawi and Mozambique, all SADC countries' data is aggregated at national level (Administration Level 1). Though metadata for the datasets in the table does exist, it is drawn from multiple sources, thus its reliability/quality depends on the source.

### Rules of access

The data is displayed as interactive maps on the internet. Shape files with accompanying tabular data can be downloaded too. Agro-MAPS contains copyrighted material and/or other proprietary information, and thus is protected worldwide by international intellectual property agreements and copyright laws. The data can be downloaded and used only for non-commercial purposes as long as the source is acknowledged.

### Selected publications

Various resources are available from the Information Systems section, e.g. AgroMAPS, AQUASTAT, CLIMWAT, CROPWAT, GLASOD, Glossary Land and Water Terms, IPNIS, Irrigation Equipment, Nutrient Responses, ProSoil, Terrastat and WOCAT. Online access to more than 160 publications on land, soil fertility, plant nutrition and water is available. This includes access to digital media series such as the 31-volume CD-Rom series on land and water, compilations of all volumes published in 13 different publication series, and more than 3 000 maps in digital and printable format.

## 3.4 GeoNetwork

Website: <http://www.fao.org/geonetwork>

### Description

GeoNetwork is FAO's Spatial Data and Information Portal. It provides internet access to interactive maps, satellite imagery and related spatial databases. Its purpose is to improve access to and integrated use of spatial data and information. GeoNetwork promotes and enhances multidisciplinary approaches

to sustainable development, and supports decision-making on agriculture, forestry, fisheries and food security. GeoNetwork enables easy sharing of spatial data among different FAO units, other UN agencies, NGOs and other institutions.

This website is intended to assist anyone looking for maps, GIS datasets, satellite imagery and related thematic datasets, and anyone wanting to disseminate their own data via the internet. GeoNetwork allows users to search for and download GIS datasets relating to agriculture produced by FAO and other UN agencies and subscribers. This is an excellent resource for, among others:

- ▶ decision-makers (e.g. sustainable development planners and humanitarian and emergency managers) needing quick, reliable, up-to-date and user-friendly cartographic products as a basis for action and to better plan and monitor their activities;
- ▶ GIS experts needing an exchange of consistent and updated geographical data; and
- ▶ spatial analysts needing multidisciplinary data to perform preliminary geographical analysis and reliable forecasts to better set up appropriate interventions in vulnerable areas.

### **Geographical coverage**

Global coverage with thematic maps and satellite imagery is available. Southern African data is available but mainly at national scale.

### **Data holdings**

GeoNetwork contains geo-referenced data in the following domains:

- ▶ National and sub-national boundaries
- ▶ Infrastructure (roads, lights, etc.)
- ▶ Land cover, environment, elevation and weather
- ▶ Global land and water resources
- ▶ Agro-ecological zones
- ▶ Farming and livestock systems
- ▶ National land-use statistics
- ▶ Agricultural production
- ▶ Livestock production and animal diseases
- ▶ Socio-economic conditions (human population, poverty rates)
- ▶ Satellite imagery

### **Rules of access**

GIS files on the GeoNetwork website can be downloaded for use at no cost. Maps, including those derived from satellite imagery, are effective communication tools that play an important role in the work of various user categories: data is provided in formats compatible with most professional GIS applications and a range of freeware GIS tools.

Data has a link to proceed for download. You will have to confirm that you agree with the download conditions and disclaimer. You are asked to provide your personal details, and invited to provide feedback on your use of the data. A number of datasets may only be downloaded for an area of interest.

### **Selected publications**

This web portal has no publications available at the time of writing (September 2006).

## **3.5 Global Livestock Information System (GLIS)**

Post: **Livestock Information and Policy Branch, FAO Headquarters, Room C510, Viale delle Terme di Caracalla, 00100, Rome, Italy**

Phone: **39-065-7053634**

Email: **joachim.otte@fao.org**

Website: **<http://www.fao.org/ag/aga/glipha/index.jsp>**

Contact person: **Joachim Otte**

### **Description**

The GLIS objective is to compile the best available archive of detailed, sub-national, global livestock data, beginning with the most recent data available, and to facilitate the dissemination of this data in

standardised, value-added formats for review, analysis, research and planning. Various products are made available to the public via intermediate information systems including:

- ▶ national summaries via Livestock Sector Briefs;
- ▶ administrative level one summaries via the Global Livestock Production and Health Atlas (GLiPHA) (and thus via EMPRES-I); and
- ▶ modelled global livestock data, entitled “Gridded Livestock of the World”, via GeoNetwork.

Original data (or summaries thereof) is made available within the FAO, and to other close collaborators, based on specific requests for information. The original available GLIS data for Southern African countries is presented below.

The GLiPHA is a user-friendly, highly interactive electronic atlas using the Key Indicator Mapping System (KIMS) developed by the World Agriculture Information Centre of the FAO. The atlas provides a scaleable overview of spatial and temporal variation of quantitative information relating to animal production and health through a combination of maps, tables and charts.

The system objective is to facilitate access to large amounts of information stored in databases of governmental and international organisations. Moreover, the atlas is intended to contribute to increasing awareness of socio-economic, human and animal demographic and health issues, and that it will improve information management and exchange at national and international level.

### Geographical coverage

Global, regional and national coverage is available.

### Data holdings

Southern Africa data.

Country	Year	Level	Items
Angola	2000	1	human demographics
Angola	2001	1	land, livestock population
Botswana	2000	2	human demographics
Botswana	2002	2	land, livestock populations
Congo, DR	2000	1	land, human demographics, livestock population
Lesotho	2000	1	land, human demographics, livestock population
Madagascar	2002	2	land, livestock population
Malawi	2000	1	land, human demographics, livestock population
Mauritius	-	0	-
Mozambique	1997-2000	1, 2	land, human demographics, livestock population, animal disease
Namibia	1995-2001	1	land, human demographics, livestock population
Tanzania	1995-2001	1	land, human demographics, livestock population, animal disease
South Africa	1996-2002	1, 2	land, human demographics, livestock population, animal disease
Swaziland	1999, 2000	1	land, human demographics, livestock population
Zambia	1994-2000	1, 2	land, human demographics, livestock population
Zimbabwe	2000, 2002	1, 2	land, human demographics, livestock population

The GLIS is very much a work in progress, its aim being to increase direct public access to the source database (through a simple query interface). But, in addition to resource-based constraints, there are issues pertaining to data ownership, data quality, metadata and standardisation that would have to be addressed to make this possible.

National boundaries, including disputed areas, are standardised to the UN Cartographic Office, while the boundaries and codes for sub-national administrative units are less well standardised, for various reasons, including:

- ▶ the need to match these with the tabular data available for a particular country (which may not match any particular standard boundary or code);
- ▶ the very frequent changes in sub-national boundaries, names and codes within countries; and
- ▶ the lack of a recognised standard, with global coverage.

Where possible the GLIS has harmonised boundaries and codes with the UN's long-standing Second Admin Level Boundaries (SALB) project, and with FAO-SDRN standards recently (April 2005) brought together in the form of the Global Administrative Unit Layers (GAUL) dataset.

The SALB project, led by the World Health Organisation (WHO), collects data to the second admin level as reported in 2000. It also requires that the countries officially endorse this data. This has caused problems in terms of poor coverage (globally), no standards for higher admin levels, and changes to administrative boundaries made between 2000 and the year of livestock data availability.

The spatial and temporal resolutions are highly variable from country to country, and are determined by data availability. The emphasis to date (2002-2005) has not been on entering data that would provide temporal profiles, but rather on entering the most recent data available for the globe. Spatial resolution is as high as possible, ranging from very small parishes in the United Kingdom to very large, admin level one data for many African countries.

The data is available online via the various products of the GLIS.

### **Rules of access**

Data is available free of charge, the conditions being that: data contained in the GLiPHA is made available by official and unofficial sources; the FAO assumes no responsibility for data accuracy, completeness and coherence; and the data will be used for unofficial purposes only.

### **Selected publications**

Global Livestock Production and Health Atlas (GLiPHA)

## **3.6 AQUASTAT (FAO)**

Email: [aquastat@fao.org](mailto:aquastat@fao.org)

Website: <http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm>

### **Description**

AQUASTAT is FAO's global information system of water and agriculture developed by the FAO Land and Water Development Division. The AQUASTAT objective is to provide users with comprehensive information on the state of agricultural water management worldwide, with an emphasis on developing countries and countries in transition.

The information system consists of:

- ▶ Database – online data by country;
- ▶ Country Profiles – standardised text by country with summary tables;
- ▶ Regional Overviews – standardised text by region with summary tables;
- ▶ Spatial Information – spatial data on water resources and irrigation;
- ▶ Institutions – online database of national and regional institutions;
- ▶ Water Resources – renewable water resources by country;
- ▶ Agricultural Water Use – review of agricultural water use by country;
- ▶ Documents – Online publications and links to document databases;
- ▶ Links – interesting links on water and agriculture; and
- ▶ Glossary – defining variables.

The database contains country-based information on water and agriculture in the following main categories:

- ▶ Land use and population
- ▶ Climate and water resources
- ▶ Water use, by sector and by source
- ▶ Irrigation and drainage development
- ▶ Environment and health

### **Geographical coverage**

Global, regional and national.

## Data holdings

Spatial data relates to water resources and irrigation (<http://www.fao.org/ag/agl/aglw/aquastat/gis/index.stm>), and consists of maps, downloadable spatial datasets and background documentation on how the spatial information was obtained. It covers the following subjects:

- ▶ Global Map of Irrigated Areas – spatial dataset on areas equipped for irrigation.
- ▶ Atlas of Water Resources and Irrigation in Africa – information on water resources and agricultural water use by river basin.
- ▶ Database on African Dams – a geo-referenced database of large African dams.
- ▶ Climate Information Tool – a tool to provide climate estimates for the land surface of the globe.
- ▶ Spatial Data – downloadable datasets relating to water resources and irrigation.
- ▶ Global Maps – key maps on, for example, percentage of population undernourished, irrigated area as a percentage of cultivated area, and agricultural water withdrawal as a percentage of total renewable water resources.

## Rules of access

The AQUASTAT database can be queried online (<http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm>). The query results can be downloaded in CSV format. The current database provides data per 5-year period if available. It should be noted, however, that for most variables, no time series could be made available. The current version of the database is in development and still slow if many variables are selected.

## Selected publications

- ▶ Irrigation in Africa in Figures: AQUASTAT Survey (2005)
- ▶ Publication Series: Water Report No. 29 (2005)
  - Download as PDF document (6 191 KB)
- ▶ Development and validation of the global map of irrigation areas
- ▶ Publication Series: paper (2005)
  - Download as PDF document (7 638 KB)
- ▶ Key water resources statistics in AQUASTAT
- ▶ Publication Series: paper (2005)
  - Download as PDF document (441 KB)
- ▶ AQUASTAT Global Information System on Water and Agriculture
- ▶ Publication Series: information brochure (2003)
  - Download as PDF document (1 615 KB)
- ▶ AQUASTAT – Getting to Grips with Water Information for Agriculture
- ▶ Publication Series: paper (2003)
  - Download as PDF document (679 KB)
- ▶ Agriculture, Food and Water: a contribution to the World Water Development Report
- ▶ Publication Series: miscellaneous (2003)
  - Download as PDF document (4 166 KB)
- ▶ Review of world water resources by country
- ▶ Publication Series: Water Report No. 23 (2003)
  - Read document online or download as PDF (8 997 KB)
- ▶ Crops and drops: making the best use of water for agriculture
- ▶ Publication Series: information brochure (2002)
  - Read document online or download as PDF (4 292 KB)
- ▶ The FAO irrigated area forecast for 2030
- ▶ Publication Series: paper (2000)
  - Download as PDF document (250 KB)
- ▶ Irrigation in Latin America and the Caribbean in figures
- ▶ Publication Series: Water Report No. 20 (2000)
  - Download as PDF document (12 172 KB)
- ▶ Les aménagements hydro-agricoles en Afrique: situation actuelle et perspectives
- ▶ Publication Series: unpublished document (1999)
  - Download as PDF document (286 KB)
- ▶ Irrigation in the countries of the Former Soviet Union in figures
- ▶ Publication Series: Water Report No. 15 (1997)

- ▶ Irrigation in the Near East in figures
- ▶ Publication Series: Water Report No. 9 (1997)
- ▶ Irrigation potential in Africa: A basin approach
- ▶ Publication Series: FAO Land and Water Bulletin No. 4 (1997)

#### **4. United Nations Environment Programme Division of Early Warning and Assessment (UNEP-DEWA)**

Street: **United Nations Environment Programme, United Nations Avenue, Gigiri, Nairobi**  
 Post: **PO Box 30552, Nairobi, 00100, Kenya**  
 Phone: **254-20-7621234**  
 Fax: **254-20-7624489/90**  
 Email: **unepinfo@unep.org**  
 Website: **http://www.unep.org/**  
 Contact person: **Charles Sebukeera**

##### **Description**

UNEP's activities cover a wide range of environmental issues and environment-related problems, and sustainable development. Its present programme of work focuses on five areas:

- ▶ Environmental information
- ▶ Assessment and research – including environmental emergency response capacity and strengthening of early warning and assessment functions
- ▶ Enhanced co-ordination of environmental conventions and development of environmental policy instruments
- ▶ Fresh water
- ▶ Industry and technology transfer and support to Africa

The functional UNEP programmes:

- ▶ Environmental Information Assessment and Early Warning
- ▶ Environmental Policy Development and Law
- ▶ Environmental Policy Implementation
- ▶ Technology, Industry and Economics
- ▶ Regional Co-operation and Representation
- ▶ Co-operation with Environmental Conventions
- ▶ Communications and Public Information

The UNEP maps and graphics database:

- ▶ Environment Times – environmental information in a newspaper format, mapping human impacts on the biosphere in maps and graphics.
- ▶ Poverty mapping – case studies, publications, maps and graphics.
- ▶ Globalis – an interactive world map with statistics on environment and development (specifically on the Millennium Development Goals).

##### **Geographical coverage**

Global.

##### **Data holdings**

UNEP.Net is a global portal to authoritative environmental information based on themes and regions. The UNEP.net website provides links to the following thematic portals: Climate change; Freshwater; GEO data; Mountains; Socio-economic; Urban environment

##### **Rules of access**

Most data is available free of charge.

##### **Selected publications**

UNEP-DEWA is also responsible for the Global Environmental Outlook (GEO) and African Environment Outlook (AEO) reports as well as the African Environmental Information Network (AEIN).

## 5. Climate Change Portal

Email: [webmaster@grida.no](mailto:webmaster@grida.no)  
Website: <http://climatechange.unep.net/>  
Contact person: Duane Taylor

### Description

This portal is a central source for substantive work and information resources regarding climate change. Find information based on the key issues within climate change or select a specific type of resource.

This portal uses the UNEP.Net decentralised and distributed system that allows the integrated applications to query and generate reports from remote environmental databases and servers. This architecture enables the contributing publishers to continue to upgrade their systems and update their information holdings locally with the benefits realised directly by the partnership. In negotiating contributions with partners, UNEP maintains respect for intellectual property, but encourages its partners to exchange and make their information and data available free of charge. The site also hosts independent specialised solutions and information/data of its publishers developed to address specialised environmental issues and concerns. The dynamic and integrated applications can be accessed by specialised software and toolkits provided through the site, or directly with a web browser, in which case less functionality is exposed to the user. For instance, downloading a copy of the freely distributed Arc-Explorer and using it to overlay maps, etc., allows extensive manipulation of the map-based applications.

### Geographical coverage

Global climate coverage with specific data on Africa.

### Data holdings

Various climate data available.

### Rules of access

Open access to datasets is given free of charge.

### Selected publications

- ▶ Vital climate graphics – the impacts of climate change (CD-Rom)
- ▶ Climate Change 2001: Impacts, Adaptation and Vulnerability – contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). IPCC Working Group II; James J. McCarthy, Osvaldo F. Canziani et al., eds. (2001)
- ▶ Climate Change 2001: Mitigation – contribution of Working Group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) IPCC (2001)
- ▶ Climate Change and Human Health: Impact and Adaptation – by R. Kovats et al. (2000)
- ▶ Fresh Air? Fresh Air?: Options for the Future Architecture of International Climate Change Policy – Alex Evans (2002)
- ▶ Guide to the Climate Change Negotiation Process – United Nations Framework Convention on Climate Change (UNFCCC) (2000)
- ▶ Kyoto Protocol to the United Nations Framework Convention on Climate Change – UN (1997)
- ▶ Technologies, Policies and Measures for Mitigating Climate Change – IPCC Technical Paper I (1996)

## 6. Poverty Network

Post: **Service Box 706, N-4808 Arendal, NORWAY**  
Phone: **47-37035659**  
Fax: **47-37035050**  
Website: <http://www.povertymap.net/>

### Description

Poverty Mapping is a joint initiative of the FAO, UNEP, CGIAR and their partners dedicated to:

- ▶ analysing and mapping the spatial distribution of poverty;
- ▶ producing and promoting the use of poverty maps, and showing linkages between poverty and food insecurity, the environment and development; and
- ▶ promoting the use of poverty maps in policy making and targeting assistance.



The Poverty Network promotes the use of poverty maps in policy making and targeting assistance, particularly in the areas of food security and environmental management. Its website offers access to:

- ▶ a global spatial database of poverty mapping examples and possible indicators;
- ▶ a comprehensive library of books, newsletters, articles and other publications relating to poverty and the environment;
- ▶ links to additional information; and
- ▶ specific information on food security, poverty and the environment, including case studies from nine developing countries.

The site also makes available numerous case studies and publications relevant to SAKSS, and gives basic information on poverty mapping and how to undertake poverty mapping.

### **Geographical coverage**

Global coverage with specific maps on Africa.

### **Data holdings**

This website makes available a host of geographical data, reports and graphics on a wide range of themes, including demographic indicators, economy and markets, education, energy, food security, health, poverty indicators, urban areas, and water and sanitation.

### **Rules of access**

Open access to all data is given free of charge.

### **Selected publications**

- ▶ Mapping Global Urban and Rural Population Distributions: Estimates of future global population distribution to 2015 (pdf), Salvatore et al., FAO (2005)
- ▶ Locating the Poor: Spatially Disaggregated Poverty Maps for Sri Lanka, Research Report No. 96 (pdf), A. Upali et al. (2005)
- ▶ Inventory of Sub-national Poverty Indicators, Dan Prager (2004)
- ▶ The application of a spatial regression model to the analysis and mapping of poverty (pdf), A. Petrucci et al., University of Florence, FAO (2004)
- ▶ Poverty Mapping: A Tool to Improve Effectiveness of Agricultural Development Activities (pdf), UNEP/GRID-Arendal (2003)
- ▶ Mapping and Geographic Analysis of Human Welfare and Poverty: Review and Assessment, Norbert Henninger (1998)

## **7. Globalis**

Post: **UNEP/GRID-Arendal, Longum Park, Service Box 706, N-4808 Arendal, Norway**

Phone: **47-84121427**

Fax: **47-37035050**

Email: **mapmaster@grida.no**

Website: **<http://globalis.gvu.unu.edu/>**

Contact person: **Hugo Ahlenius**

### **Description**

Globalis.gvu.unu.edu is a unique collaboration between the Norwegian UN Association, UNEP/GRID-Arendal, the UNU/Global Virtual University, the University College of Hedmark and the INTIS schools. The project is supported by the Norwegian Ministry of Foreign Affairs and the Norwegian Agency for Development Cooperation.

Globalis is an interactive world atlas that enables the user to decide what is to be displayed on the map. Its aims to enhance understanding of similarities and differences among human societies, and how societies influence life on the planet. This is done by primarily visual means.

The UN and other international organisations collect large quantities of statistics each year from all over the world. These cover a wide range of issues, and are often presented in lengthy reports and tables that are not easily adapted for school use. Globalis makes these statistics available in a simpler and more

visual format. It contains a large database of explanations and categories of new UN statistics arranged thematically.

As a UNEP consortia initiative, Globalis welcomes collaboration with other agencies.

### **Geographical coverage**

Global coverage, with detailed information on Southern Africa.

### **Data holdings**

Globalis contains a wide variety of statistical and thematic datasets, including: Climate; Agriculture; Land Use; Economy; Education; Environment; Gender; Health; Human Development; Population; and Water.

### **Rules of access**

Open access is given to all data free of charge.

### **Selected publications**

This site is a web portal and has no publications at this time.

## **8. United Nations Economic Commission for Africa (UNECA)**

Post: **UNECA, PO Box 3001, Addis Ababa, Ethiopia**

Phone: **251-11- 5511167** or **5443562**

Fax: **251-11-5510512**

Email: **aopoku-mensah@uneca.org**

Website: **<http://www.uneca.org/disd/geoinfo/>** and **<http://geoinfo.uneca.org/metadataexplorer/>**

Contact person: **Aida Opoku-Mensah**

### **Description**

Geo-information technologies enable the collection and processing of land-related data efficiently, rapidly and cost-effectively – using global positioning systems, computer mapping, remote sensing and geographic information systems (GIS) – making it possible to relate economic and development decisions to specific locations or markets.

In the next three years UNECA will establish a facility offering Member States easy access to up-to-date tools, techniques and global data resources. UNECA will provide the gateway software that will link to nodes in African countries through which they can make their records accessible. UNECA will organise a series of hands-on training workshops in five sub-regional locations to promote more country-specific systems, hosted by Member States themselves or by UNECA on their behalf.

UNECA will also increase its work on National Spatial Data Infrastructure (NSDI), encompassing the technology, policies, criteria, standards and people necessary to promote geospatial data sharing; the integrating infrastructure and geo-information policy into NICI plans (<http://www.uneca.org/aisi/NICI/>); and fostering public participation in geo-information management. The US-based ESRI company and the International Steering Committee on the Global Map (ISCGM) are UNECA's partners in developing NSDIs and providing grants to countries doing so.

### **Geographical coverage**

The website provides links to geospatial data, web maps and metadata for the whole of Africa.

### **Data holdings**

The datasets are: Health; Infant mortality; Key indicators; Socio-economic data; Demographics; Metadata; etc.

### **Rules of access**

All data is accessible at no cost. UNECA is also involved in developing policy on geo-information in Africa and setting geo-information standards. It makes various documents available, including the SDI implementation toolkit, and drives the Mapping Africa for Africa initiative. UNECA has produced poverty

maps for some Southern African countries (e.g. Malawi, Tanzania, Mozambique), and issued a report on poverty mapping in Africa with case studies from several countries.

### **Selected publications**

- ▶ The challenges for ICT in Africa
- ▶ Economic report for Africa 2005 – spatial maps targeting and mapping poverty, by Adrian Gauci.
- ▶ Poverty Maps: A useful tool for policy design to reduce poverty, Adrian Gauci & Vanessa Steinmayer.
- ▶ Poverty profiles: A methodological note on measuring poverty, Abebe Shimeles & Reto Thoenen.

## **9. ReliefWeb**

Post: **ReliefWeb Geneva, Office for the Coordination of Humanitarian Affairs, Palais des Nations, CH-1211, Geneva, Switzerland**  
Phone: **41-22-9171234**  
Email: **maps@reliefweb.int**  
Website: **www.reliefweb.int**

### **Description**

ReliefWeb is the world's leading online gateway to information (documents and maps) on humanitarian emergencies and disasters. An independent vehicle of information designed specifically to assist the international humanitarian community in delivering effective emergency assistance, it provides timely, reliable and relevant information as events unfold, while simultaneously emphasising "forgotten emergencies".

ReliefWeb has seen steady growth in usage. In 2002 it received 1,5 million hits per week, and in 2004 approximately 1 million per day. Shortly after the South Asia tsunami disaster of December 2004, it received 3 million hits per day on average.

ReliefWeb disseminates timely, reliable and relevant humanitarian information by means of site-updating around the clock. In addition, the site reaches over 70 000 subscribers via its email subscription services, enabling people with low-bandwidth internet connections to receive information reliably.

ReliefWeb posts some 150 maps and documents daily from over 2 000 sources ranging from the UN system to governments, NGOs, academia and the media.

All documents posted on the site are classified and archived in the ReliefWeb document database, allowing for advanced searching for documents on past emergency responses. The database contains nearly 300 000 maps and documents dating back to 1981. ReliefWeb's Map Centre creates original maps.

In addition to its maps and emergency updates by date, country, region and emergency, ReliefWeb offers various resource sections specifically targeting relief professionals:

- ▶ Appeals and Funding – funding appeals for complex emergencies and natural disasters, and financial tracking of responses to funding requirements
- ▶ Policies and Issues – online library of reference materials covering humanitarian policies and other global issues
- ▶ Professional Resources – information of practical use to relief professionals, including a sectoral or thematic listing of "communities of practice", listings of job and training opportunities, and a contact directory of humanitarian organisations.

The site also offers a "web feed" service to deliver customised content to partners' websites. The service allows users to further utilise the ReliefWeb content, thereby avoiding duplication of efforts.

### **Geographical coverage**

Maps are available for the entire globe, and for the Democratic Republic of Congo, Lesotho, Zambia, Angola, Madagascar, Zimbabwe, Mozambique, Malawi, etc., specifically.

### **Data holdings**

Themes covered for Africa are: Health; HIV/AIDS; Agriculture; Natural resources; Demographics; Satellite imagery; Weather and climate; etc.

### **Rules of access**

Data is easily accessible from a web-based GIS system.

## Selected publications

There are several new articles available, including:

- ▶ FAO/GIEWS – Food Outlook No. 1, 2006
- ▶ FAO – Crop Prospects and Food Situation No. 2, 2006
- ▶ ZimOnline (Zimbabwe) – As a matter of fact, 27 July 2006
- ▶ PHO (Sudan) – PHO opens a field mission, 27 July 2006
- ▶ WFP – EC donates 30 million Euros to hungry in three Southern African countries, 27 July 2006

## 10. GRID-Arendal

Post: **UNEP/GRID-Arendal, Longum Park, Service Box 706, N-4808 Arendal, Norway**  
Phone: **47-37035650**  
Fax: **47-37035050**  
Email: **grid@grida.no**  
Website: **<http://www.grida.no/>**  
Contact person: **Svein Tveitdal**

### Description

The GRID-Arendal mission is to provide environmental information, communications and capacity-building services for information management and assessment. Established to strengthen the UN through the UN Environment Programme (UNEP), GRID-Arendal focuses on making credible, science-based knowledge comprehensible to the public, and decision-making for sustainable development.

GRID-Arendal is an official UNEP centre located in southern Norway, with offices in Geneva, Ottawa and Stockholm.

Dedicated to making a difference, GRID-Arendal explores how environmental information impacts on decision-making and on the environment. Seeking to bridge the gap between science and politics, increasing attention is given to environmental journalism and working with the media in general. GRID-Arendal provides analysis and supports communication on issues such as climate change, environment and poverty, environment and security, the urban environment and sustainable development through education.

GRID-Arendal is a world leader in environmental cartographic products, and impacts greatly in enhancing decision-makers' and the general public's understanding of key environmental issues and their consequences.

GRID-Arendal is organised around four main fields of competence, implemented in different geographical areas:

- ▶ Awareness Raising and Outreach
- ▶ Capacity Building in Environmental Information management
- ▶ Environmental Assessments
- ▶ Environmental Education

GRID-Arendal and UNEP have published several books and articles on environmental issues and challenges facing the globe, a recent example being Planet in Peril: An Atlas of Current Threats to People and the Environment.

They are jointly responsible for EARTHWire Africa, a news portal providing a daily overview of environmental news from selected African countries.

They also have an extensive graphics and map library. Most data is free. They do work as map-development consultants for agencies on request. Their coverage is global but they have conducted extensive work in Africa.

The UNEP Shelf Programme has been established to support developing countries in establishing their delineation of the continental shelf, to enable them to properly state their claims. This is an interactive map in the UNEP Shelf Programme One Stop Data Shop (OSDS), displaying the existing inventory of geo-scientific data held by the Shelf Programme.

### Geographical coverage

Global coverage with specific African data available.

## Data holdings

The data covers: Biodiversity; Climate Change; Poverty; Waste; Water; Environment and Security; etc.

## Rules of access

Most data is accessible free of charge, and for some a nominal fee is charged.

## Selected publications

- ▶ Africa Environment Outlook No. 2: Our Environment, Our Wealth (AEO-2)
- ▶ UNEP 2006
- ▶ Africa's Lakes: Atlas of Our Changing Environment – launch date 22 August 2006
- ▶ Planet in Peril: Atlas of Current Threats to People and the Environment
- ▶ GRID-Arendal 2006
- ▶ Challenges to International Water: Regional Assessments in a Global Perspective

## 11. Environmental Information Systems Africa (EIS-AFRICA)

Post: **Postnet Suite No. 156, P/Bag X15, Menlo Park, 0102, Pretoria, South Africa**

Phone: **27-12-3491068**

Fax: **27-12-3492080**

Email: **sgovender@eis-africa.org**

Website: **<http://www.eis-africa.org/>**

Contact person: **Sives Govender**

### Description

EIS-Africa is a unique pan-African NGO developing African capacity to generate, manage, disseminate and use geospatial, earth observation data and environmental information to enrich policy debate and support decision-making for the wellbeing of the African people.

It serves the continents geo-information community as a whole and is responsible for, among other things, the brand management of AFRICAGIS, the biggest GIS conference on the continent.

EIS-AFRICA's primary focus is networking, and it does this by publishing a monthly newsletter and contributing to strategic geo-information studies and papers.

EIS-AFRICA has a large contact database of African and international GIS experts and practitioners. It also offers a web-based mapping facility, and serves SADC land-cover and infrastructural datasets.

EIS-AFRICA is keen to collaborate with and assist any partner to develop networks and access to spatial data for the sub-region.

It facilitates distribution of free LandSat imagery for Africa, promotes open source technologies and utilises the GeoNetwork technologies.

### Geographical coverage

Africa-wide data coverage available free of charge.

### Data holdings

The data available on the Web Map Service (WMS) viewer includes: satellite imagery, including 1 375 LandSat MSS scenes and 1 288 LandSat TM and ETM+ scenes; MODIS Fire archive, MSG Fire archive and ESA ATSR Active Fires sample; CSIR towns, urban areas, roads, rivers, national parks and provinces of South Africa; Burn Scars 2005-01-01 ESA, SRTM DEM ICEDS; South African Land Cover data; and MODIS ICEDS Blue Marble are.

### Rules of access

Provides open access to all data free of charge.

### Selected publications

EIS-AFRICA has published several documents, including the following:

- ▶ Environmental Information Systems (EIS) best practices in Africa: The case study of Ghana, Senegal, Mozambique, Uganda and Zimbabwe
- ▶ Geo-information Supports Decision-Making in Africa: EIS-AFRICA position paper for the WSSD
- ▶ Determination of Fundamental Geospatial Datasets for Africa

## 12. Regional Centre for Mapping of Resources for Development (RCMRD)

Post: **RCMRD, PO Box 632, Nairobi, 00618, Kenya**  
 Phone: **254-20-8560227**  
 Fax: **254-20-8563767**  
 Email: **rcmrd@rcmrd.org**  
 Website: **www.rcmrd.org**  
 Contact person: **Dr Wilbur Ottichilo**

### Description

The RCMRD, previously known as Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), was established in Nairobi, Kenya, in 1975, under the auspices of the United Nations Economic Commission for Africa (UNECA) and the then Organisation of African Unity (OAU). Its founder members are Kenya, Uganda, Somalia, Tanzania and Malawi, and the Government of the Republic of Kenya hosts it. It is a non-profit intergovernmental organisation, currently with 14 contracting Member States: Botswana, Comoros, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Somalia, Sudan, Swaziland, Tanzania, Uganda and Zambia.

The RCMRD provides training courses on GIS and remote sensing. Many of its services and products are available free of charge, and it is willing to support and work with regional partners.

### Geographical coverage

Data coverage is available for Southern and East Africa.

### Data holdings

The RCMRD provides links to numerous fundamental data holdings in Africa, and hosts and distributes African LandSat imagery.

### Rules of access

LandSat imagery is distributed free of charge, but many other spatial products are available only on a commercial basis.

### Selected publications

None of the publications available are relevant to Southern Africa.

## 13. World Food Programme (WFP) – Vulnerability Assessment and Mapping

Street/Post: **WFP, Merafe HOUSE, 11 Naivasha Road, Sunninghill, 2157, Johannesburg, South Africa**  
 Phone: **27-11-5171634**  
 Fax: **27-11-5171642**  
 Email: **wfpinfo@wfp.org**  
 Website: **www.wfp.org**  
 Contact person: **Amir Abdulla**

### Description

In 1994 the WFP became the first UN agency to adopt a mission statement to eradicate global hunger and poverty. As the food aid arm of the UN, the WFP uses its food to:

- ▶ meet emergency needs; and
- ▶ support economic and social development.

The WFP also provides the logistics support necessary to get food aid to the right people at the right time and in the right place. It works to put hunger at the centre of the international agenda, promoting policies, strategies and operations that directly benefit the poor and hungry.

The WFP helps victims of natural disasters and displaced people – both refugees and internally displaced persons – to leave towns and villages in places such as Darfur, the Democratic Republic of Congo and Colombia. It is the world's largest international food aid organisation combating hunger in underdeveloped nations with severe food shortages. The frontline stretches from sub-Saharan Africa and the Middle East to Latin America, Asia and the Pacific.

The WFP works closely with the other UN family members, governments and NGOs, providing its logistics expertise to guarantee delivery of all kinds of humanitarian aid.

### **Geographical coverage**

The coverage is global, with specific information available for Angola, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe.

### **Data holdings**

Mainly reports with maps of hunger hotspots of the world.

### **Rules of access**

Most data is accessible free of charge.

### **Selected publications**

The World Hunger series is an annual publication aimed at policy-makers, focusing on practical strategies to end hunger. Each edition examines a key issue relating to hunger, such as learning, health, markets, crises and social exclusion.

## **KEY NATIONAL AGENCIES**

This section briefly describes a selection of key national agencies that host and distribute geospatial information through web-based facilities.

### **1. Angola**

#### **1.1 Development Workshop (DW) Angola**

Street: **Rua ReiKatyavala 113, Luanda**

Post: **C.P. 3360, Luanda, Angola**

Phone: **244-2448366**

Fax: **244-2449494**

Email: **[dwang@angonet.org](mailto:dwang@angonet.org)**

Website: **<http://dw.angonet.org>**

Contact person: **Allan Cain**

#### **Description**

DW Angola is a non-profit organisation working to improve the living conditions of the poor in less-developed Angolan communities. Its areas of focus include shelter, peri-urban settlement upgrading, water supply and sanitation, primary health care, small enterprise development and disaster mitigation. DW's strategy is to strengthen the capacity of communities and organisations to act on development problems and opportunities.

Founded in 1973, DW has worked with communities, grassroots organisations, NGOs, local and national government authorities and international organisations in more than 30 countries. DW's work is funded on a project basis by grants from NGOs, national and international development agencies and private foundations. DW is registered as a non-profit group and does not raise funds directly from the public.

The DW Monitoring and Research Unit is an information and knowledge service provider to DW projects, partner organisations and government and non-governmental institutions. The unit's main areas of intervention are:

- ▶ access to information – online and physical libraries and an information distribution network;
- ▶ context monitoring – media scan journal;
- ▶ GIS service provision;
- ▶ map production – A4-A0 maps, 2005 satellite imagery for Huambo city, 2002 satellite imagery for Luanda;
- ▶ database management assistance to DW projects; and
- ▶ impact assessment studies for DW projects.

## Research

The unit is coordinating and supervising a range of research projects, often in collaboration with national and international partners. The focus areas of DW research activities are:

- ▶ land – peri-urban and rural;
- ▶ urban development – including sectoral studies on issues such as water and sanitation;
- ▶ informal market;
- ▶ microfinance;
- ▶ peace-building and reconstruction; and
- ▶ provincial and municipal profiles.

## Geographical coverage

National and sub-national level data is available.

## Data holdings

Water and sanitation, etc.

## Rules of access

Most data is accessible free of charge and some only for a fee.

## Selected publications

DW has launched a book entitled *TERRA Urban Land Reform in post-war Angola: Research, advocacy and policy development*. Co-authored with the Centre for Environment and Human Settlements (UK), it is based on pioneering research on urban land access in Angola. The themes discussed include: growth and settlement patterns in peri-urban areas; formal and informal mechanisms to access land; cultural values and perceptions about land; institutional capacity for urban land management; decision-makers' attitudes to and perceptions of urban development; and land policy and legislation. The book also documents the use of action research as an advocacy tool in the drafting of the 2004 Land Law and the associated public consultation process – the first-ever law making process in Angola involving broad popular participation.

## 2. BOTSWANA

### 2.1 Botswana Central Statistics Office (CSO)

Post: **Government Statistician, Central Statistics Office, P/Bag 0024, Gaborone, Botswana**

Phone: **267-3952200**

Fax: **267-3952201**

Email: **csobots@gov.bw**

Website: **<http://www.cso.gov.bw/>**

## Description

The Botswana CSO is a department in the Ministry of Finance and Development Planning. It is the apex body in the country's official statistical system, hence most official statistical operations fall within its mandate. More specifically, the CSO aims may be outlined as follows:



- ▶ To act as the nodal agency for planned development of the statistical system in the country.
- ▶ To lay down and maintain the norms and standards in the field of statistics, involving concepts and definitions, methodology of data collection, processing of data and dissemination of results.
- ▶ To provide an advisory service to government and other users on all statistical matters and related subjects.
- ▶ To provide regular and timely statistical information on the economic and social state of the country and its people.
- ▶ To provide statistical information on the socio-economic status of households and families.
- ▶ To provide information on population characteristics from time to time.
- ▶ To conduct the large-scale all-Botswana sample surveys for creating a database for studying the impact of specific problems in diverse socio-economic areas (employment, consumer expenditure, literacy, health, informal sector activity, etc.) to the benefit of different population groups.
- ▶ To provide an in-house facility to process the data.
- ▶ To conduct and arrange the training programmes in statistics and related subjects.
- ▶ To disseminate to government, parastatals, SADC member states and other national and international organisations information on different aspects of the statistical system by means of regular or ad-hoc publications and seminars/workshops.
- ▶ To ensure that the CSO work programme reflects the needs of the system users, and to encourage frequent communication with users to enable ongoing assessment of their needs.
- ▶ To expand the scope for statistical services as and when resources permit.

### **Geographical coverage**

The whole of Botswana is covered.

### **Data holdings**

The CSO Cartographic Unit (Cunit) came into being as an ad-hoc unit mainly to render mapping services to the CSO for the 1991 Population and Housing Census. It was established as a permanent unit after the Census to fulfil the mapping needs of the entire CSO.

Maps are needed at all stages of a census/survey, i.e. those of planning, collecting data, presenting results and analysing them. Since a mapping programme involves inputs of labour, time and money, the need for maps in a census/survey undertaking may be questioned. If the objective of a census/survey is to produce accurate, timely and useful data, then maps are a valuable tool for attaining it.

The Cunit is responsible for all CSO cartographic work, which mainly entails production of Census Enumeration Area (EA) maps and thematic maps for CSO publications. Outputs include:

- ▶ **Delineation of Enumeration Area (EA) maps:** Enumeration area delineation enables construction of EAs so as to give each EA a population approximating the ideal size. An ideal population size is determined by the number of people one enumerator can enumerate in the time period scheduled for data collection. The unit updated the 1991 Population and Housing Census maps for the 2001 Census.
- ▶ **Digitisation of Enumeration Area (EA) maps:** The CSO is busy digitising its enumeration area maps. This exercise is being carried out in two phases. So far, seven Census districts have been digitised and their data has been linked. The linked data reflects enumeration area number, number of households and total number of persons per EA, and the number of dwellings will be added soon. Data entry for a total of 172 villages in the seven districts is complete, and the 1991 and 2001 CENSUS data is also available.
- ▶ **Envisaged major developments in the Strategic Plan period 2003/4-2004/5:** digitisation of all enumeration area maps at both district and village level, including data linking; and production of a Population Census Atlas.

### **Rules of access**

Most data reports are available on the website. For certain data a fee is charged.

### **Selected publications**

A variety of statistical data and reports are available on health, education, deaths, etc.

## 2.2 Botswana GIS Coordination Unit – Surveys and Mapping

Street/Post: **GIS Coordination Unit, Department of Information Technology, 9th Floor, Ministry of Education Building (Block 6), Government Enclave, Gaborone, Botswana**

Phone: **267-3656919**

Fax: **267-3904144**

Email: **gis.unit@gov.bw**

Website: **http://www.ngis.gov.bw**

Contact persons: **Theresa Sebina and Gosego Garegope**

### Description

The National Spatial Data Infrastructure of Botswana was developed as part of the Government's National Geographic Information System (GIS) Initiative. The overall aim of this project is to improve planning and decision-making through more efficient use within government of geo-information and the GIS. The more specific aim is to facilitate more efficient management of existing geographic data by increasing user competence and improving coordination of geo-information within the GIS user community.

Available now is a metadata service and data request service. The latter is an application based on Scalable Vector Graphics (SVG) and designed to enable internet browsing and exchange of data, both raster and vector. The order is sent to the GIS Coordination Unit, which acknowledges it and redirects it to the relevant organisation. The metadata is supplied by agencies participating in the National GIS Initiative.

No spatial analysis project in the country has focused on providing a data dissemination service, but the GIS Coordination Unit does provide links to data sources.

This government unit can directly influence policy. There is also a national steering committee for the GIS initiative that meets to discuss spatial data sharing in Botswana and functions as a data clearinghouse. Access to the National GIS Initiative documents is restricted; they can be accessed only on request.

### Geographical coverage

The whole of Botswana is covered, from national to municipal level.

### Data holdings

The GIS Coordination Unit offers: geospatial, geodetic and cadastral data; data on administrative areas, soils, elevations, groundwater depth, groundwater isolines and satellite imagery; contact addresses; a digital atlas; and metadata through the metadata service.

### Rules of access

Access to data is restricted; the website will instruct users how to proceed. Using the above-mentioned SVG technique, the user can view a dataset and specify on the attached order form which data is wanted in which coordinate system, preferred output format, etc.

### Selected publications

GIS Data Survey for Botswana, Swede Survey, 2003.

## 3. Malawi

### 3.1 National Spatial Data Centre (NSDC) of Malawi

Street: **Zowe House, City Centre, Lilongwe**

Post: **NSDC, P/Bag 311, Lilongwe 3, Malawi**

Phone: **265-1-773622**

Fax: **265-9-933 948**

Email: **nsdc@malawi.net dnIm\_lis@malawi.net**

Website: **http://www.malawi.gov.mw/nsdc/index.htm** and

**http://www.malawi.gov.mw/nsdc/Data\_catalogue.htm**

Contact person: **Richie Muheya**

### Description

The NSDC mandate is to provide the base information that supports other application areas including analysis for agricultural growth.

The role of the Malawi Geographic Information Committee (MAGIC) and the NSDC is to assist in the establishment of a National Spatial Data Infrastructure in Malawi. Capacity in the country for GIS-related activities is currently limited, but the potential of the GIS to assist in development planning and poverty reduction is clear. There is also a requirement to encourage and facilitate coordination of GIS-related activities nationally. Therefore, apart from facilitating user access to existing spatial datasets, the NSDC offers GIS-related services to Malawi's producer and user communities, at a cost that will enable the NSDC and MAGIC to attain financial self-sustainability while maintaining a not-for-profit status.

The NSDC services are: digital map production; spatial data analysis, using ArcGIS; scanning and digitising; plotting; and training.

### **Geographical coverage**

National and sub-national coverage.

### **Data holdings**

Most of the fundamental datasets including topographic and cadastral data.

### **Rules of access**

All services and data must be paid for.

### **Selected publications**

None relevant to this inventory at this time.

## **4. Mozambique**

### **4.1 Direcção Nacional de Geographia e Cadastro (DINAGECA) – national mapping agency of Mozambique**

Street/Post: **DINAGECA, Ave Josina Machel 537, Maputo, Moçambique**

Phone: **258-21-321804**

Email: **dinageca@dinageca.gov.mz**

Website: **www.dinageca.gov.mz**

Contact persons: **S. Dambiane** and **Jose Elias Mucombo**

### **Description**

As the national mapping agency, DINAGECA is the custodian of many fundamental datasets. Its website contains a Land Information System (LIS) and an infrastructure map.

### **Geographical coverage**

National to municipal coverage of the whole of Mozambique.

### **Data holdings**

DINAGECA is responsible for holding: topographic and cadastral maps; aerial photographs; geodetic and digital products; satellite imagery; and digital orthophoto imagery.

### **Rules of access**

Web maps are provided, and basic data is free but a fee is charged for all other data.

### **Selected publications**

None relevant to this inventory at this time.

## 4.2 SETSAN – Agricultural Research Institute of Mozambique

Street: **Ave Das FPLM No. 2696, Recinto do IIAM, Pavilhão Novo**  
Post: **SETSAN, C.P. 1928, Maputo, Moçambique**  
Phone: **258-1-461874**  
Fax: **258-1-461850**  
Email: **mlibombo@setsan.org.mz**  
Website: **<http://www.setsan.org.mz/geonetwork/srv/pt/main.search>**  
Contact person: **Marcela Libombo**

### Description

There are longstanding ongoing efforts in Mozambique to coordinate government and donor initiatives for food security, but they have not always achieved success. The current umbrella body for such initiatives is SETSAN, a technical secretariat for food security and nutrition that brings together the relevant government ministries, the National Institute for Disaster Management and key donors such as the WFP and some NGOs. SETSAN is led by the Ministry of Agriculture and Rural Development. The food security stakeholders are:

- ▶ government departments – Ministry of Agriculture and Rural Development, Ministry of Planning and Finance, Ministry of Industry and Commerce;
- ▶ monitoring networks – especially for crop forecasting – including the Famine Early Warning System Network and the Vulnerability Assessment Committee;
- ▶ companies in the private sector – grain millers, etc.;
- ▶ international NGOs;
- ▶ civil society and local NGOs – Associacao Rural de Ajuda Mutua (ORAM), etc.;
- ▶ research organisations – Eduardo Mondlane University, etc.;
- ▶ Donors – DFID, EU, WB, USAID, etc.; and
- ▶ UN or humanitarian agencies – WFP, UNICEF, FAO, UNAIDS and UNDP.

### Data holdings

Maps are available from the GeoNetwork site. These maps reflect: soils; droughts; cattle ownership; maize crops; limpopo basin per capita productivity; soil fertility; hazards; agro-climate; etc.

### Geographical coverage

Coverage is national to district level.

### Rules of access

Maps from the GeoNetwork are downloadable free of charge.

### Selected publications

- ▶ Plano de Acção de Mitigação aos Efeitos da Seca em 2005
- ▶ Estudo de Avaliação do Impacto de Implementação do Plano de Acção e Mitigação à Estiagem e Seca nas Províncias de Janeiro de 2005
- ▶ Evaluation Study of the Implementation of the Drought and Mitigation Action Plan for Maputo – Gaza and Inhambane Provinces, January 2005
- ▶ Emergency Assessment Report for Mozambique, 2005

## 5. Namibia

### 5.1 Geological Survey of Namibia (GSN)

Street: **1 Aviation Rd, Windhoek**  
Post: **GSN, P/Bag 13297, Windhoek, Namibia**  
Phone: **264-61-84811**  
Fax: **264-61-249144**  
Email: **anguno@mme.gov.na**  
Website: **[www.gsn.gov.na](http://www.gsn.gov.na)**  
Contact person: **Anna Nguno**

## **Description**

The GSN is a directorate in the Ministry of Mines & Energy. Its mission is to enhance awareness and knowledge of Namibia's geological resources through scientific investigation, and application and dissemination of quality research data. It facilitates the search for and assessment of mineral resources, geological engineering initiatives and land-use planning activities through sustainable development with due regard to the environment.

As custodian of Namibia's rich endowment of geological resources, the GSN facilitates responsible development and sustainable utilisation of these resources to the benefit of all Namibians. The GSN:

- ▶ provides geo-scientific information through research to promote sustainable development and investment in Namibia;
- ▶ guides land-use decisions to ensure the availability and sustainability of resources for the current and future welfare of Namibian society;
- ▶ stimulates investment in Namibia's mining sector in order to contribute to the development of Namibia's economy; and
- ▶ creates awareness of the earth sciences so as to enhance understanding of the geo-environment and its interaction with the life-supporting system of the Namibian people.

Namibia's history of mineral investigation and geological research spans more than 100 years. The colonial and post-colonial governments and mining companies invested or are investing billions of dollars in geological investigation in the country. The results are contained in thousands of files, maps and reports housed in the GSN archive in Windhoek. In the past, GSN staff and the public had open access to the original versions of this unique and mostly irreplaceable material, but deterioration has necessitated its conversion into digital format. The GSN is currently scanning this archival material, and will make it accessible through the Earth Data Namibia database.

## **Data holdings**

The Earth Data Namibia project started in 2001 with scientists of the Economic and Regional Geology Divisions of the GSN designing the database in cooperation with BEAK Consultants of Freiberg/Germany. Funding for this project came from the Minerals Development Fund and government. Earth Data Namibia is customised software used for managing geological and related data held by the GSN. It is designed as a client-server-solution within the GSN local area network, intended both for internal use and for disseminating open-file mineral exploration and other geological data to the public.

Earth Data Namibia presently contains spatial and factual data on: mineral deposits and occurrences; exploration and mining licences; drilling; geochemistry; geological reports; maps and other printed material; related topographic and cadastral information (farms, roads, etc.); and metadata on scanned archival material.

The database uses ORACLE and ARCVIEW as platforms for storing and managing this factual, geometrical and unstructured information. User-generated maps (showing, for instance, geochemical data on a regional geology backdrop) can be printed out as hard copies or saved as print files through an automated map layout facility. ARCVIEW Earth Data Namibia forms part of the GSN's strategy to standardise the process of data collection and facilitate easy access to and recovery of information relating to the country's natural resources.

## **Geographical coverage**

National to sub-national coverage is available.

## **Rules of access**

The database makes JPEG maps available free of charge.

## **Selected publications**

Various policy papers, studies and reports with geo-information are available.

## 6. South Africa

### 6.1 National Spatial Information Framework (NSIF)

Street: **184 Jacob Mare St, Pretoria**  
Post: **NSIF, P/Bag X833, Pretoria, 0001, South Africa**  
Phone: **27-12-3129256**  
Fax: **27-12-3265187**  
Email: **athabethe@dla.gov.za**  
Website: **www.nsif.org.za**  
Contact person: **Abigail Thabethe**

#### Description

The NSIF is a national initiative to coordinate the development of infrastructure needed to support the utilisation of spatial information in decision-making. This building of a Spatial Data Infrastructure (SDI), as it is termed in similar endeavours across the world, involves policy-making, institutional arrangements, developing human resources and setting standards for geographic information.

There is a focus in the NSIF on developing mechanisms to improve access to existing information, avoid duplication in data collection and management, and ensure that new data captured can easily be utilised together with existing geographic data to enhance their collective value. In 1997 the Department of Land Affairs established a component to coordinate the development of the NSIF.

The NSIF is unique in that it aligns efforts to develop spatial data infrastructure that will enable the sharing and re-use of information, thereby producing savings through reducing the considerable cost involved in recapturing spatial data. Optimal benefit from the use of spatial information and GIS technology is obtained by integrating a variety of spatial data, possibly from disparate sources, for the purposes of spatial analysis and decision support. This allows for greater coordination and integration of government-driven projects, and therefore more optimal allocation of scarce resources.

For geospatial data (free metadata and datasets), the Spatial Data Discovery Facility (SDDF) provides links to about 23 nodes in South Africa, from which the links must be followed to access the data and metadata. The NSIF hosts a metadata clearinghouse with web maps, and coordinates the network of the Committee of Spatial Information (CSI).

To access metadata for framework datasets, the NSIF holdings are: Cadastral Boundaries (Urban & Rural – 1:50 000); Land Cover (1:250 000); Hydrographical Data; Perennial Rivers (1:50 000); Non-Perennial Rivers (1:50 000); Dams (1:50 000); Catchments Areas (primary/secondary/tertiary); Lagoons; Lakes; Lakes/Vleis; Canals; Perennial Pans; Non-Perennial Pans; Dam Areas; and Dam Walls.

Metadata access is free of charge. The metadata tells the user how to access the data. The NSIF does not carry out any analysis of spatial data to assist agricultural growth and rural poverty analysis, but it does provide a facility that advises users where to get the necessary data.

The NSIF is willing to collaborate with any agency in the world working with geo-information and SDI. The NSIF mandate is to cover all of South Africa's GIS data.

#### Geographical coverage

National coverage.

#### Data holdings

Provides metadata links to most fundamental datasets in South Africa.

#### Rules of access

Open access is given to all government data except cadastre free of charge.

#### Publications

Spatial Data Infrastructure Act of South Africa

## 6.2 Chief Directorate Surveys and Mapping

Post: Chief Directorate Surveys and Mapping, P/Bag X10, Mowbray, 7705, Cape Town, South Africa  
Phone: 27-21-6584300  
Fax: 27-21-6891351  
Email: [dclarke@sli.wcape.gov.za](mailto:dclarke@sli.wcape.gov.za)  
Website: <http://w3sli.wcape.gov.za/>  
Contact person: Derek Clarke

### Description

The Chief Directorate Surveys and Mapping (CDSM) is responsible for the production of South Africa's various definitive series of maps and aerial photographs, as well as geodetic and digital products. These are marketed through the website Map Manager: Introduction to e-commerce. The site is to be expanded to include all other products and all services of the directorate. Users have to order the products or data they require, and all standard products are free of charge.

With the increasing use of GPS as a positioning tool for various applications, the CDSM has installed an array of active GPS base stations throughout the country.

The CDSM does not carry out any analysis unless it receives a specific request.

All new CDSM proposals stand a good chance of influencing government policy.

The CDSM published the report on the Determination of Fundamental Datasets for Africa study conducted under the Mapping Africa for Africa initiative.

### Geographical coverage

National to provincial coverage. The CDSM can also provide maps for Lesotho and Swaziland, and land-cover maps for the whole SADC sub-region.

### Data holdings

Products include:

- ▶ aerial photographs;
- ▶ maps – aeronautical, orthophoto, provincial, topographic, topocadastral and topo-administrative;
- ▶ *digital* maps, orthophoto images, elevation models, topographic maps (1:50 000) and topographic information;
- ▶ wall maps of Southern Africa (1:2 500 000) and South Africa (1:1 000 000);
- ▶ ICAO world aeronautical charts and an aeronautical chart for the PWV Region; and
- ▶ price lists for maps, charts and aerial photographs.

### Rules of access

Most data is available free of charge.

### Selected publications

None relevant to SAKSS-SA at this time.

## 6.3 Satellite Applications Centre (SAC)

Post: SAC, PO Box 359, Pretoria, 0001, South Africa  
Phone: 27-12-3345002  
Fax: 27-12-8412689  
Email: [mramusi@csir.co.za](mailto:mramusi@csir.co.za)  
Website: <http://www.sac.co.za/>  
Contact person: Mothibi Ramusi

### Description

The SAC operates in three broad areas:

- ▶ Information, Communications and Technology Services (ICTS) – including telemetry; tracking, command and satellite monitoring services; antenna erection, maintenance and operations; satellite telecommunication systems; and infrastructure planning for the continent of Africa.
- ▶ Space science application development.

- ▶ Earth Observation – encompassing remote-sensing products and value-added services; acquisition, processing and cataloguing of satellite images; and development of decision-making tools/products based on satellite datasets for areas such as food security, water management, disaster management and mitigation, housing development, national safety and infrastructure planning.

The SAC is also involved in capacity-building in these three operational areas by providing training at its receiving station.

### Geographical coverage

Southern and central Africa.

### Data holdings

The SAC offers satellite images and value-added products (e.g. National Land Cover Database, 1:250 000). It also develops geo-products. A complete catalogue of SAC products and services is available on the website. It is involved in analysis around issues such as change detection, natural disaster management and image processing:

- ▶ **Spot-4 Xi and Mono** (June 1999 – current date)
- ▶ **Spot-1/2 Xs and Pan** (June 1989 – current date)
- ▶ **LandSat 7 ETM** (April 2001 – current date)
- ▶ **LandSat 5 TM** (June 1989 – 19 Aug 2001)
- ▶ **ERS-1/2** (January 1994 – current date)
- ▶ **NOAA** (November 1984 – current date)
  - Only images from 1 April 2001 onwards are viewable in the Online Catalogue.
- ▶ **IKONOS** (current date)
  - Not in Online Catalogue. SAC is a distributor; contact SAC for satellite programming and product purchase.
- ▶ **RADARSAT** (current date)
  - Not in Online Catalogue. SAC is a distributor; contact SAC for satellite programming and product purchase.
- ▶ **Orbview-2 SeaWiFS** (July 1998 – current date)
  - Only images from 1 April 2001 onwards are viewable in the Online Catalogue. Products not available for commercial users.
- ▶ **LandSat MSS** (December 1986 – November 1993)
  - No data available for the period June 1990 to May 1993.
- ▶ **LandSat MSS** (1972-1979)
- ▶ Scenes purchased from Eros Data Centre.

### Rules of access

Data is available on a commercial basis only, but LandSat data for SADC is provided free of charge.

### Selected publications

The SAC newsletter provides information on key Earth Observation activities in Southern Africa.

## 6.4 Agricultural Geo-referenced Information System (AGIS)

Phone: 27-12-3196197

Email: [JimmyWS@nda.agric.za](mailto:JimmyWS@nda.agric.za)

Website: <http://www.agis.agric.za/agisweb/agis.html>

Contact person: Jimmy Weir-Smith

### Description

Geo-referenced information on land, climate, plant nutrients, agricultural production, water resources, etc., integrated with infrastructural and socio-economic indicators, is essential to enabling policy-makers, land users and all stakeholders to make the right choices in their efforts to achieve sustainable food production and agricultural development in an increasingly complex environment. The need for geospatial information and means to access it in South Africa for decision-making and development planning purposes is a topical issue that inevitably invokes discussion on uncoordinated efforts, a lack of funding and expertise, and unavailability of high-quality standardised data. The National and Provincial Departments of Agriculture, the Agricultural Research Council (ARC) and other spatial information providers together hold a wealth of information, but it is not readily accessible. The AGIS was established to address these shortcomings.



AGIS provides dynamic maps, advisories and reports, a Natural Resources Atlas of South Africa, and other geospatial data. It is keen to establish partnerships with other agencies working in its field of specialisation.

### **Geographical coverage**

National data.

### **Data holdings**

Geo-referenced information on land, climate, plant nutrients, agricultural production and water resources, integrated with infrastructural and socio-economic indicators.

### **Rules of access**

Web maps on the website are accessible and downloadable free of charge.

### **Selected publications**

- ▶ *National Resource Atlas of South Africa 2006*
- ▶ The website contains numerous advisories and reports on issues such as climate, migratory pests and plant protection.

## **7. Zambia**

### **7.1 Zambian Association of Geographic Information Systems (ZAGIS)**

Post: **Postnet No. 336, P/Bag E89i, Lusaka, Zambia**

Phone: **260-01-293838**

Fax: **260-01-293848**

Email: **info@zagis.org.zm**

Website: **http://www.zagis.org.zm**

#### **Description**

ZAGIS was founded in 1992 as a support network for all people working with geospatial information in Zambia. Its mission is to play a lead role in the promotion and maximisation of the use of geographical information systems in Zambia. Its specific objectives are:

- ▶ to promote capacity-building and human resource development in Zambia;
- ▶ to promote cooperation and exchange of information among GIS users in Zambia;
- ▶ to cooperate and establish links with national, regional and international institutions to promote the use of GIS;
- ▶ to promote and facilitate dialogue among policy-makers and the public in GIS matters; and
- ▶ to develop and maintain an inventory of experts and institutions involved in the use of GIS.

ZAGIS undertakes a wide range of activities on behalf of its members and the GIS community. It provides access to GIS facilities, and all paid-up members have open access to services free of charge. Its activities include:

- ▶ organising technical seminars and workshops, generally aimed at exposing members to GIS software developments and enhancing their GIS skills;
- ▶ providing access to a technical problem-solving team and technical committee whose expertise can help members solve GIS problems and answer other queries;
- ▶ maintaining a database of individuals and organisations involved with GIS in Zambia to give ZAGIS members, the whole GIS community and other interested parties ready access to information on these individuals and organisations' interests and projects;
- ▶ organising the annual GIS Day conference and seminar, giving members access at a reduced fee;
- ▶ representing the GIS community at national and international level;
- ▶ arranging work placements for student members, to expose students in GIS-related fields to the real world of GIS, with members encouraged to host interns for short periods;
- ▶ producing a quarterly newsletter on ZAGIS activities and GIS-related topics; and
- ▶ providing links to aerial photography, satellite imagery, topographic/cadastral maps, etc.

**Geographical coverage**

National.

**Data holdings**

Provides links to core datasets.

**Rules of access**

Access to data is generally free of charge.

**Selected publications**

No relevant publications available at this time.

# SUMMARY OF FINDINGS

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We undertook the compilation of this inventory almost entirely through web searches. While Southern Africa has invested a great deal in developing web-based mapping services, it soon became apparent that it is still very difficult to get a response to both email and telephonic requests for information.

The search process was further complicated by the fact that many websites were not properly registered with search engines. Some sites we found by trial and error, or by fortuitous discovery of a deeply buried link. This said, the listed agencies/organisations that produce, host and serve geospatial information numbered well over 100, which was a good starting point, and this number excludes mapping agencies that did not yet have a website as well as those that do not publish their maps online.

The study focused on the Southern African Development Community (SADC), and we were not surprised to find that numerous international and regional agencies provide many gigabytes of and links to geospatial data for SADC countries, and that multi-national agencies had developed several web-based mapping facilities for SADC countries. However, in many cases the actual data does not reside in the country studied or even in Africa, but only on servers in Europe or North America.

Much of the information available focuses on natural resources and fundamental datasets, i.e. topographic data, cadastral data, satellite imagery, rivers, etc. In most cases we found basic web maps and graphics readily available in various guises, but very little analytical data.

In most cases data coverage is national to global, with maps and other products at varying scales. The predominant scale for national datasets is 1:50 000. Sub-national data was almost impossible to find for all countries except South Africa. Most datasets found have multi-year coverage, but this study could not determine indicators such as accuracy and quality due to the absence of metadata for the vast majority of datasets.

South Africa has the most diverse geospatial datasets, and is the only SADC country to have promulgated the Spatial Data Infrastructure (SDI) Act, which essentially makes freely available to the public all spatial information captured by government agencies and hence paid for by the taxpayer. A number of non-governmental agencies in South Africa also provide diverse web-based geospatial data, such as the Satellite Application Centre (SAC) which offers satellite imagery and distributes LandSat imagery covering most of Africa free of charge.

Elsewhere in the SADC sub-region we found varying degrees of information availability. Most agencies with stable websites provide web maps and metadata catalogues for their data. Very few charge a fee for basic data – national cadastral survey agencies being among those that usually do charge. In most cases maps can be downloaded as JPEG images or viewed at no cost.

At present, of all the SADC countries, it is most difficult to access data from Zimbabwe. It is easier to access these data from the SAHIMS ZimDAT portal link to the Central Statistics Office of Zimbabwe than from the country itself. Few Zimbabwean government websites are fully functional.

Many SADC countries have benefited from the United States Geological Survey's donation of free LandSat imagery from the 1980s. Several agencies offer downloads of this data, e.g. the SADC-RRSU, the Regional Centre for Mapping Resources for Development and EIS-Africa.

Most agencies surveyed have web-based mapping facilities and an open-access policy, and most welcome data sharing and collaboration.

While agencies appreciate and largely accept the spatial data infrastructure concept, many have found it difficult to implement. The National Spatial Information Framework (NSIF) in South Africa and the

SADC Regional Remote Sensing Unit (SADC-RRSU) have made commendable efforts to develop spatial data infrastructure, but more collaborative work is required. Though in its infancy in SADC countries, the Spatial Data Infrastructure (SDI) movement is evident, and it can be argued that once SDI principles such as standards and sharing are adopted at national level, many of the remaining barriers to data access will disappear.

The implementation of standards for spatial data has been a problem for the SADC sub-region because the technical complexity of ISO TC211 for geographical standards is often a barrier. The tendency has been to apply proprietary standards from vendors of GIS software, and this has hampered the integration of data for the whole Africa region. Better application of standards will improve data integration and promote data sharing throughout the region.

For a selection of key agencies, relatively detailed profiles are provided in the body of this report. The *complete* inventory compiled from the study is annexed as a comprehensive spreadsheet including the names and contact details of all agencies by country and a brief description of their data holdings.

An inspection of the spreadsheet indicates that the UN agencies work actively on developmental issues in the SADC sub-region, and effectively work at global and regional scale. Other projects, such as the FAO National Crop Assessments, are carried out at national level. The undertakings of UNEP, UNECA, WFP, FAO, etc. are extensive, and most data on their projects is available free of charge.

Some organisations surveyed restrict access to their data, but this is a legacy of the historic trend of selling maps and map products. Global experience indicates that selling basic geospatial data and maps is not profitable as so much is being distributed free of charge. But many agencies are commercialising value-added services rather than selling data per se.

Southern Africa's young web-based mapping services show great potential for growth, especially due to open-source software and free products. Poor infrastructure, low bandwidth, lack of technical capacity, and data security issues have impeded this growth, but these are rapidly being addressed, and once Africa has addressed some broader Information and Communication Technology (ICT) issues, the continent's geo-information community as a whole will take web-based mapping services to new levels of sophistication.

# RECOMMENDATIONS AND CONCLUSION

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EIS-Africa's main aim in compiling this inventory for SADC was to provide information about agencies that hold and serve geospatial data – foundation datasets and other data chiefly on poverty and livelihoods; population, demography and health; economy and markets; social and political conditions; agriculture, biophysical conditions (especially land and water) and climate; and remote sensing (including imagery).

Thematic agricultural and biophysical data was relatively easy to find, while data on agricultural growth specifically and rural poverty was difficult to find, due largely to the fact that very few national poverty-mapping programmes having been implemented in the SADC sub-region.

The SADC-RRSU does provide vital data for food security analysis and agricultural productivity maps, but this data has yet to be leveraged with socio-economic, demographic and satellite imagery. One key recommendation of this study is that a coordinated and integrated poverty-mapping and agricultural growth survey should be undertaken in all SADC countries.

Arguably, there is more available and readily accessible data for Southern Africa than for the other African sub-regions. Southern Africa holds a broad range of consistent and harmonised datasets. This can be attributed to the activities of the SADC-RRSU, which recognised in 1997 the importance of harmonising all the data contributed by government agencies, non-governmental agencies and individuals in SADC countries. In a way this study has served as a forerunner to the Spatial Data Infrastructure (SDI) initiative.

The SADC-RRSU holds and serves data and metadata associated with all the priority geo-information datasets for SADC. The SADC-RRSU was recently restructured and relocated, which left sub-regional coordination wanting for a time. The SADC-RRSU metadata clearinghouse is an excellent geospatial portal, but we found its links inaccessible, which constrains our findings. However, the SADC-RRSU will undoubtedly be strengthened by its relocation to Gaborone, and is sure to continue playing a lead role in the coordination of geo-information for SADC.

We found also that much of the freely available data is set at a coarse resolution of 1 km, or a mapping scale of 1:1 000 000. These values will not be of much help at sub-national level, particularly in smaller countries. There is a clear need for concerted efforts to build consistent fundamental geospatial datasets for each country, each sub-region of Africa and the continent as a whole.

In this regard, national agencies should be supported in collating and harmonising existing datasets at scales appropriate for local application. This would ensure that multi-scale analysis can be performed from global to local level. In the absence of smaller-scale data, environmental, developmental, socio-economic assessments will tend to be global or continental snapshots. Smaller-scale data supports global reporting processes as well as decision-making on local issues. Fortunately, initiatives such as Mapping Africa for Africa are addressing the question of how to map Africa comprehensively. Priority data at appropriate scales is being identified to support Africa in its attempt to develop integrated information management systems to meet its NEPAD and Millennium Development Goal (MDG) targets.

This study has shown that many data custodians are increasingly adopting the internet as a data distribution channel. Most agencies are serving data using dedicated web-based mapping tools, data portals or File Transfer Protocol (FTP) sites, and most claim that access to their web data is free of charge.

The challenge, however, remains that of Africa's low-bandwidth internet connection, which makes the downloading of data an extremely difficult process for a great many potential users. Therefore, though

large volumes of useful data are theoretically available at no cost, the datasets tend to be too large to access in practice. Remedying this situation would obviously entail major improvements to most African countries' telecommunications infrastructure. In this regard we recommended a more robust pan-African framework for facilitating exchange and leveraging of information.

It is important to note that most organisations using geospatial information in Africa have been doing so for basic mapping purposes. This work is still largely the domain of the national survey and mapping agencies, which often produce maps merely to fulfil a specific national mandate with no consideration given to issues such as sustainable development and poverty alleviation. They use GIS technology and the most basic of internet services to source and produce static maps.

Much of the spatial analysis on the web is presented separately from textual reports and supporting bar graphs, pie charts, etc. The integration of this textual and graphic information with any associated analysis would enhance the quality of end products. With the SDI movement and initiatives such as Mapping Africa for Africa, mapping agencies across the continent are evolving to become the primary drivers for change, using the GIS data-analysis function to support decision-making processes. More work in the realm of GIS analysis is needed.

GIS has proved to be an effective tool for decision-making throughout the world, its power lying in the fact that it is capable of representing complex scenarios in a very simple but effective way. For SADC countries it is important to adopt a region-wide integrated approach to capturing priority spatial datasets. Census data, and data on land cover, agriculture, etc., are foundational datasets underpinning any development information system. Countries need to invest in collecting this data and building a spatial data infrastructure as urgently as they would prioritise building a water, rail or road infrastructure.

Greater strides need to be made towards improving access to data, and towards developing more open economies and societies in Africa. Clearly this requires acceptable and realistic approaches to finding 'African solutions'. Access to some types of data will understandably remain restricted for very many reasons, but access to widely available data should no longer be a problem impeding development, whether attributable to a limited bandwidth, an institutional gatekeeper mentality or something else.

The constantly evolving and emerging technologies provide opportunities for exploring new approaches to building an information economy. However, in the SADC countries where over-concentration on the public sector remains a formidable constraint; there is a clear need to open doors for the local small-scale private sector to play a meaningful role in facilitating the emergence of SADC's information economy. Failure to explore new approaches will result in continued undermining of countries' ability to leverage data on their assets as a development undertaking.

Finally, though it would have been valuable to travel to the four priority countries to conduct interviews to facilitate a more comprehensive understanding of the geospatial information issues at play in each country, the desktop study nonetheless uncovered a wealth of information. This study is a mere starting point, and hopefully it will prove useful to the growing network of agencies producing and holding geospatial data – especially on poverty and agriculture. It should be appreciated that this first version of the inventory is a good initial source of information, but regular research and updating is required.

Most of the key issues in the study terms of reference were addressed. Within the constraints described above, a comprehensive list of agencies holding and serving priority geospatial datasets was compiled, and their data inventories are described in the annexed spreadsheets. However, some issues were difficult to assess as very limited metadata is available. There is also limited information regarding the use of geospatial data to support agricultural growth and poverty alleviation strategies. Much of the poverty-related work has been undertaken by multi-national agencies. National statistics agencies in some cases, such as in South Africa, hold poverty data but with no link to agriculture. This reinforces the view presented above that Southern Africa is still focused on mapping and has yet to move into GIS analysis. Wherever analysis has been done, it is limited to projects conducted within prescribed geographic areas.

The study found that many agencies are willing to share their data. We therefore recommend that SAKSS-SA send a letter of introduction to as many agencies as possible to collaborate in drafting a memorandum of understanding to facilitate data sharing in future.

Several key geo-information agencies and initiatives are moving the GIS community of Africa forward. These include the Global Spatial Data Infrastructure (GSDI); UNECA's CODI-GEO Mapping Africa for Africa initiative, SAHIMS, TIGER Africa, the Global Earth Observation (GEO) network and the Global Land Cover Network (GLCN). SAKSS-SA must endeavour to participate in these forums to stay informed and to ensure that its own information requirements are placed on the agenda in these discussions.

In conclusion, this study was a necessary exercise as no inventory of the relevant agencies exists. However, this inventory must be regarded as a working document, and its development must be continued beyond the scope of the study. This initiative is vital in SAKSS-SA's efforts to develop a knowledge base for Southern Africa.

# REFERENCES

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1. EIS-AFRICA website, <http://www.eis-africa.org/>
2. ESRI GIS.com, <http://www.gis.com/index.cfm>
3. GISD website, <http://www.eis-africa.org/EIS-Africa/GISD>
4. GSDI website, <http://www.gsd.org>
5. UNECA CODI-GEO website, [http://www.uneca.org/codi/codi\\_torgeo.htm](http://www.uneca.org/codi/codi_torgeo.htm)
6. Gyamfi-Aidoo, Schwabe & Govender, “A synthesis report on Fundamental Geospatial Datasets in Africa”, 2006.
7. “What is GIS?”, <http://www.gis.com/whatisgis/index.html>



## ANNEX 1: TERMS OF REFERENCE FOR THE STUDY

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### **Inventory of Sources of Geospatial Information In Support of Strategic Analysis and Knowledge Management Concerning Poverty and Agricultural Growth**

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The Strategic Analysis and Knowledge Support System Network for Southern Africa (SAKSS-SA) has three main objectives:

1. to promote broader analysis of agricultural investment opportunities for enhancing rural incomes and growth in southern Africa;
2. to promote broader analysis of the impacts of agricultural development programs on the alleviation of poverty and food insecurity in southern Africa; and
3. to build capacity in the region for carrying out such analyses through creation of a “community of practice” among participating researchers, policy makers and development managers.

The capabilities developed through this program will ultimately help governments and donors to assess how their development programs can more effectively contribute to meeting the Millennium Development Goal of reducing the proportion of people living in hunger and poverty by 50% by the year 2015.

To facilitate the establishment of the SAKSS-SA, an inventory is needed of geo-spatial data holdings in southern Africa that can support the pursuit of the objectives outlined above. SAKSS-SA has already engaged two consultant teams in an inventory of institutions involved in poverty assessment and agricultural growth. The inventory of geospatial data should build upon these assessments and expand the resulting knowledge base by identifying other institutions and organizations that have relevant geo-spatial data holdings in the southern Africa (SADC) region.

Specifically, the inventory will provide a listing of institutions holding the following geospatial data (with an emphasis on those that may offer data access to SAKSS):

1. thematic baseline data (foundation layers);
2. poverty and livelihoods;
3. population, demography and health;
4. economic and markets;
5. social and political;
6. agricultural;
7. biophysical (especially land and water) and climatic; and
8. remotely sensed (including imagery).

The organizations inventoried will be described and characterized in terms of the following:

1. their geo-spatial data holdings and extent of geographic coverage;
2. the scale or level of resolution of these data;
3. the quality of documentation, including data and data standards;
4. adherence to geo-spatial data infrastructure guidelines as applied within the region, if any;
5. the means of access or distribution policies for these data, if any; and
6. provision of node or web mapping services as well as their compliance with Open GIS Consortium (OGC) standards.

## Outputs and Deliverables:

1. Excel spreadsheet summarizing a list of organizations, key contact personnel, contact addresses (including mailing, telephone, internet and email addresses), and an indication of their interest in collaboration with the SAKSS-SA network;
2. A 1-2 page descriptive profile of each organization, covering the fields included in the spreadsheet, a summary description of geo-spatial data holdings, a summary description of rules of access to these holdings, a summary description of types of geo-spatial analysis the organization conducts relating to agricultural growth and rural poverty including an indication of area of coverage, a summary description of how this analysis may be linked with policy making, and a list of recent publications of relevance to the SAKSS mandate.

A synthesis of findings summarizing availability of spatial data in southern Africa, the state of the art of geo-spatial analysis relating to agricultural growth and poverty analysis in this region, key issues of data access and associated property rights issues, capacity building needs, and options for key links with SAKSS-SA.

## Terms and Methods:

1. The inventory will encompass all SADC countries. The consultant is expected to list readily available information for all known institutions involved in the collection, storage and dissemination of geo-spatial information (including remotely sensed data) in all SADC countries. However resource constraints allow visits to only a subset of these countries. Therefore, greater detail is expected only for those countries visited; these are South Africa, Mozambique, Malawi and Zambia.
2. The consultant is expected to travel to the targeted countries in December-January 2005. Travel arrangements will be made by the consultant or the consultant's institutional sponsor. Limited facilitation support may be sought from office of the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN).
3. All data and reports will be the property of SAKSS-SA and may be displayed on their website at their discretion. Therefore, prior approval must be obtained from inventoried organizations for listing any of their individual information on this website.
4. The initial draft of this inventory should be submitted to IWMI by 20 January 2006. We expect the final report to be finished by 10 February 2006. Final payment will depend upon approval of the final report.

The consultant will report to Dr. Hilmy Sally, IWMI Director for Southern Africa, but technical advice may be provided by associated members of IWMI and ICRISAT staff linked with SAKSS-SA.

## ANNEX 2: SAKSS-SA IWMI GEOSPATIAL INVENTORY: INTERNATIONAL AND NATIONAL AGENCIES HOLDING WEB-BASED GEOSPATIAL DATA FOR SOUTHERN AFRICA

COUNTRY	AGENCY / ORGANISATION	KEY CONTACT PERSONNEL	POST / STREET ADDRESS	PHONE & FAX (Add 0 in front of area code if dialling from inside the country)	EMAIL ADDRESS / WEBSITE	
INTERNATIONAL AGENCIES	<b>Action Aid International</b>	International Secretariat	Postnet Suite No. 248 P/Bag X31 Saxonwold 2132 Johannesburg South Africa	T: 27-11-8800008 F: 27-11-8808082	mail.jhb@actionaid.org <a href="http://www.actionaid.org/">http://www.actionaid.org/</a>	
	Project data on: food, HIV/AIDS, emergencies, studies on women and girls, climate change, capacity-building for farmers and communities, harvests.					
	<b>Africa Data Dissemination Service (ADDS)</b>					<a href="http://edcintl.cr.usgs.gov/adds/">http://edcintl.cr.usgs.gov/adds/</a>
	Normalized Difference Vegetation Index (NDVI) and imagery of moisture, rainfall, malaria, etc. for SADC.					
	<b>African Centre of Meteorological Application for Development (ACMAD)</b>				T: 227-734992 F: 227-723627	climat@acmad.ne or acmadem@acmad.ne <a href="http://www.acmad.ne/homepage.htm">http://www.acmad.ne/homepage.htm</a>
	Weather, marine, climate and environment data, and satellite imagery.					
	<b>African Clearinghouse for Spatial Data</b>					webmaster@geoafrica.net <a href="http://www.geoafrica.net/links.html">http://www.geoafrica.net/links.html</a>
	Interaction maps of Africa and links to a variety of imagery, ASTER, MODIS, etc.					
	<b>AFRICOVER</b>		John Latham			John.Latham@fao.org <a href="http://www.africover.org/">http://www.africover.org/</a>
	Data on land cover in Africa.					
	<b>Air Pollution Information Network Africa (APINA)</b>					<a href="http://www.york.ac.uk/inst/sei/rapid2/apina/apina.html">http://www.york.ac.uk/inst/sei/rapid2/apina/apina.html</a>
	Relevant maps of Southern Africa.					
	<b>AQUASTAT – FAO</b>					aquastat@fao.org <a href="http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm">http://www.fao.org/ag/agl/aglw/aquastat/dbase/index.stm</a>
	Comprehensive information on the state of agricultural water management across the world, with an emphasis on developing countries and countries in transition.					
	<b>Center for International Forestry Research (CIFOR) – Regional Office for Southern Africa</b>					<a href="http://www.cifor.cgiar.org/">http://www.cifor.cgiar.org/</a>
	<b>Climate Change Portal</b>		Duane Taylor			webmaster@grida.no <a href="http://climatechange.unep.net/">http://climatechange.unep.net/</a>
A central source for substantive work and information resources on climate change, including maps and graphics of Africa. Issues covered are CO <sub>2</sub> levels, water, aridity, climate change variability, etc.						
<b>Digital Chart of the World</b>					<a href="http://www.maproom.psu.edu/dcw/dcw_about.shtml">http://www.maproom.psu.edu/dcw/dcw_about.shtml</a>	
Data on a variety of spatial information themes for Africa.						
<b>Earth Trends</b>		Dan Tunstall			dant@wri.org <a href="http://earthtrends.wri.org/">http://earthtrends.wri.org/</a>	
A comprehensive online database maintained by the World Resources Institute, focusing on environmental, social and economic trends that shape the world.						

<b>Environmental Information Systems Africa (EIS-Africa)</b>	Sives Govender	Postnet Suite No. 156 P/Bag X15 Menlo Park 0102 Pretoria South Africa	T: 27-12-3491068 F: 27-12-3492080	Sgovender@eis-africa.org www.eis-africa.org
A unique pan-African NGO developing African capacity to generate, manage, disseminate and use geospatial earth observation data and environmental information to enrich policy debate and support decision-making for the wellbeing of Africans. Holds LandSat and other data for the whole of Africa.				
<b>Empowerment for African Sustainable Development (EASD)</b>	Monika MacDevette		T: 27-83-3060030 (cell) F: 27-21-4346134	dmacdev@icon.co.za http://easd.org.za
Mainly reports on identified sustainable development issues.				
<b>FEWSNET Southern Africa – United States Agency for International Development (USAID)</b>	Mr Gideon Galu			ggalu@fews.net http://www.fews.net/
Timely early-warning and vulnerability information, images, tabular data, NDVI, RFE and WRSI ( <a href="http://earlywarning.usgs.gov/adds/index.php">http://earlywarning.usgs.gov/adds/index.php</a> ), an Atlas of the Limpopo Basin, and reports.				
<b>Food and Agriculture Organisation (FAO)</b>	Dr Reuben Sessa			rueben.sessa@fao.org www.fao.org
Digital spatial data, paper and interactive maps, reports, a Geonetwork, metadata, ARTEMIS, a GIEWS Workstation, low-resolution imagery and decadal (see also <a href="http://www.africover.org/">http://www.africover.org/</a> ).				
<b>FAO Land and Water Division – AGRO Maps</b>	Martin Ager			Martin.Ager@fao.org http://www.fao.org/ag/agl/default.stm
Concerned with development of technology, strategy and policy, and provision of advisory and technical services to FAO Members to ensure productive and efficient use of land and water resources and plant nutrients so as to meet present and future food and agriculture demands on a sustainable basis.				
<b>Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS)</b>	FIVIMS Secretariat			FIVIMS-Secretariat@fao.org http://www.fivims.net
Newsletters, guidelines, research/opinion and other series of papers, food security background papers, vulnerability case studies, and data on poverty, gender and HIV/AIDS.				
<b>Geography Network</b>				<a href="http://www.geographynetwork.com/">http://www.geographynetwork.com/</a>
Metadata, maps and imagery from various sources – on land cover, petroleum, socio-economic issues, etc.				
<b>FAO GeoNetworks</b>				<a href="http://www.fao.org/geonetwork/">http://www.fao.org/geonetwork/</a>
Allows for easy sharing of geographically referenced thematic information among FAO Units, other UN Agencies, NGOs, governments, etc. Holds GIS data on farming, irrigation, boundaries, water and precipitation, hydrology, soil, rainfall and population density, as well as satellite imagery.				
<b>Global Information and Early Warning System (GIEWS)</b>		FAO Headquarters Viale delle Terme di Caracalla 00100 Rome Italy	T: 39-6-57053099 F: 39-6-57054495	giews1@fao.org http://www.fao.org/giews/english/index.htm
Intended for monitoring food supply and demand in all countries of the world on a continuous basis; for compiling and analysing information on global production, stocks, trade and food aid; and to monitor export prices and developments on main grain exchanges. Provide policy-makers and policy analysts with the most up-to-date and accurate information available on all aspects of food supply and demand. Provides regular bulletins on food-crop production and markets at global level, and reports on a regional and country-by-country basis.				
<b>Global Land Cover Facility</b>	John Latham			<a href="http://glcf.umiacs.umd.edu/data/">http://glcf.umiacs.umd.edu/data/</a>
A wide variety of satellite imagery.				

<b>Global Livestock Information System (GLIS)</b>	Joachim Otte	FAO Headquarters Room C510 Viale delle Terme di Caracalla 00100 Rome Italy	T: 39-6-57053634	Joachim.Otte@fao.org <a href="http://www.fao.org/ag/aga/glipha/index.jsp">http://www.fao.org/ag/aga/glipha/index.jsp</a>
The GLIS objective to bring together the best available archive of detailed sub-national to global livestock data, starting with the most recent data made available, and to facilitate dissemination of this data in standardised value-added formats for review, analysis, research and planning.				
<b>Global Ocean Observing System Africa (GOOS-Africa)</b>	Jide Kufoniyi			kufoniyi@skannet.com.ng <a href="http://ioc.unesco.org/goos/africa/GOOS-AFRICA.htm">http://ioc.unesco.org/goos/africa/GOOS-AFRICA.htm</a>
A permanent global system for observation, modelling and analysis of marine and ocean variables to support operational ocean services worldwide.				
<b>GLOBALIS</b>	Hugo Ahlenius	Longum Park Service Box 706 N-4808 Arendal Norway	T: 47-37035050 F: 47-84121427 (no area code)	mapmaster@grida.no <a href="http://globalis.gvu.unu.edu/">http://globalis.gvu.unu.edu/</a>
A unique collaboration between the Norwegian UN Association, UNEP/GRID-Arendal, UNU/Global Virtual University, the University College of Hedmark and the INTIS schools. Supported by the Norwegian Ministry of Foreign Affairs and the Norwegian Agency for Development Cooperation.				
<b>GRID-Arendal</b>	Svein Tveitdal	Service Box 706 N-4808 Arendal Norway	T: 47-37035650 F: 47-37035050 (no area code)	grid@grida.no <a href="http://www.grida.no">www.grida.no</a>
The GRID-Arendal mission is to provide environmental information, communications and capacity-building services for information management and assessment. Established to strengthen the United Nations through its Environment Programme (UNEP), GRID-Arendal focuses on making credible, science-based knowledge comprehensible to the public and decision-makers for sustainable development purposes.				
<b>GSDI Association</b>	Harlan Onsrud			<a href="http://www.gsdi.org/">http://www.gsdi.org/</a>
Metadata from the GSDI clearinghouse.				
<b>International Fund for Agricultural Development (IFAD)</b>	C. Morden			pmailbox@ifad.org or c.morden@ifad.org <a href="http://www.ifad.org/">http://www.ifad.org/</a>
Projects, short articles combined with photographs, a poverty knowledge base, access to UN geo-databases, and a Rural Poverty Report 2001.				
<b>IUCN Africa-wide Data Office for Southern Africa</b>		PO Box 745 Harare Zimbabwe	T: 263-4-728266 F: 263-4-720738	lenkat@iucnrosa.org.zw <a href="http://www.iucnrosa.org.zw">www.iucnrosa.org.zw</a>
Project reports on coastal and marine, dryland and governance issues (copyright reserved).				
<b>Land Processes Distributed Active Archive Center (LP DAAC)</b>				lcac@edcmail.cr.usgs.gov <a href="http://edcdaac.usgs.gov/main.asp">http://edcdaac.usgs.gov/main.asp</a>
Established as part of NASA's Earth Observing System Data and Information System (EOSDIS) initiative to process, archive and distribute land-related data collected by EOS sensors, thereby promoting inter-disciplinary study and understanding of the integrated Earth system.				
<b>Mapping Malaria Risk in Africa (MARA)</b>	Marlies Craig			maralite@mrc.ac.za <a href="http://www.mara.org.za/">http://www.mara.org.za/</a>
Maps of endemic malaria models for Africa, and population, administrative and topographic maps of Southern Africa.				
<b>Population Development and Environment</b>		A-2361 Laxenburg Austria	T: 43-2236-8070 F: 43-2236-71313	<a href="http://www.iiasa.ac.at/Research/POP/pde/Maps/index.html">http://www.iiasa.ac.at/Research/POP/pde/Maps/index.html</a>
Links to information on Botswana, Namibia, Mozambique and Southern Africa generally.				

<b>Poverty Network</b>		Service Box 706 N-4808 Arendal Norway	T: 4-737035659 F: 4-737035050 (no area code)	<a href="http://www.poverty-map.net/publications/inventory/">http://www.poverty-map.net/publications/inventory/</a>
Holds a comprehensive library of publications, newsletters and articles relating to poverty and the environment.				
<b>Regional Centre for Mapping of Resources for Development (RCMRD)</b>	Wilbur Ottichilo			wotthichilo@rcmr.org <a href="http://www.rcmr.org/">http://www.rcmr.org/</a>
An Africa-wide data centre offering training on GIS and remote sensing. Holds LandSat imagery for the whole of Africa. Has worked in Botswana, Namibia, Lesotho, Swaziland, etc.				
<b>ReliefWeb – OCHA (UN)</b>		Palais des Nations CH-1211 Geneva Switzerland	T: 41-22-9171234	maps@reliefweb.int <a href="http://www.reliefweb.int/">http://www.reliefweb.int/</a>
The global hub for time-critical humanitarian information on complex emergencies and natural disasters.				
<b>SADC Regional Remote Sensing Unit (SADC-RRSU)</b>	Dr K. Masamvu Dorothy Nyamhanza		<b>SADC Secretariat</b> Gaborone	kmasamvu@gmail.com or dnyamhanza@sadc.int <a href="http://www.sadc.int/geonetwork">http://www.sadc.int/geonetwork</a>
Mainly data for food security analysis, and LandSat imagery.				
<b>SARDC-IMERCSA</b>	Clever Mafuta Ronald Chawatama		T: 263-4-720814 or 791141 or cell 263-11-863654	cmafuta@sardc.net or cep@sardc.net or rchawatama@sardc.net <a href="http://www.sardc.net/">http://www.sardc.net/</a>
Books, environment outlook reports and other publications covering, among other topics, environment, gender, media, sustainable democracy, economic development and disaster management. Now developing GIS maps to support the African Environmental Outlook and African Environmental Information Network initiatives.				
<b>Southern Africa Flood and Drought Network</b>				webmaster@sadc-hazards.net <a href="http://www.sadc-hazards.net/">http://www.sadc-hazards.net/</a>
LandSat imagery, flood hazard maps and up-to-date reports on developments and impacts of floods, drought and adverse weather in Southern Africa.				
<b>Southern Africa Regional Poverty Network</b>		1250 Pretorius Street Office W2, ProEquity Court, Hatfield PO Box 11615 Hatfield 0028 Pretoria South Africa	T: 27-12-3429499 F: 27-12-3425636	info@sarpn.org.za <a href="http://www.sarpn.org.za/CountryPovertyPapers">http://www.sarpn.org.za/CountryPovertyPapers</a>
Data on poverty in different SADC countries, including statistics and reports. No GIS data available.				
<b>Southern African Humanitarian Information Management Service (SAHIMS – Data Server) – UN OCHA Project</b>	Dr Georges Tadonki	P/Bag X44 Sunninghill Johannesburg 2157 South Africa	T: 27-11-5171568 F: 27-11-5171690	secretariat@sahims.net <a href="http://www.sahims.net/">http://www.sahims.net/</a>
Humanitarian and development information source for GIS data – library and reference materials and maps.				
<b>UNECA- United Nations Economic Commission for Africa Committee on Development Information</b>	Dr Aida Opoku-Mensah	PO Box 3001 Addis Ababa Ethiopia	T: 251-11-5511167 or 544 3562 F: 251-11-5510512	aopoku-mensah@uneca.org <a href="http://www.uneca.org/disd/geoinfo/">http://www.uneca.org/disd/geoinfo/</a>
Metadata clearinghouse with links to African data including maps.				
<b>United Nations Development Programme (UNDP)</b>	Christophe Nuttall			christophe.nuttall@undp.org <a href="http://www.undp.org">www.undp.org</a>
Fact sheets, maps, reports and statistics. (UNDP to be acknowledged. All data free of charge for non-profit organisations.)				

	<b>United Nations Environment Programme Division of Early Warning and Assessment (UNEP-DEWA)</b>	Charles Sebukeera		T: 254-20-623818	eisinfo@unep.org www.unep.net
	State of environment reports, maps and imagery.				
	<b>USGS – EROS Data Centre</b>	R.J. Thompson			rjthompson@usgs.gov http://www.usgs.gov/
	Satellite imagery and publications.				
	<b>Water Resources E-Atlas</b>				http://www.waterandnature.org/eatlas/
	Consists of a CD with maps of land cover, population density and biodiversity for 154 basins and sub-basins around the world.				
	<b>Wetlands International</b>	Ellen Dieme			ellen.dieme@wetlands.org http://www.wetlands.org/RSDB/
	Graphic profiles include a core set of (thematic) maps and graphic analyses, such as maps of the world and each region showing the current distribution of contracting parties and Ramsar Sites, and global distribution maps of Ramsar Sites with wetland types identified as under-represented (e.g. coral reefs).				
	<b>World Agroforestry Centre (ICRAF) – Regional Office for Southern Africa</b>				http://www.cgiar.org/ICRAF
	<b>World Health Organisation (WHO)</b>	Dr M. Younes	WHO Department of Protection of the Human Environment 1211 Geneva 27 Switzerland		Younesm@who.int or health_mapping@who.int http://www.who.int/geonetwork/srv/en/main
	Search the WHO Geonetwork for maps, GIS datasets, satellite imagery and related materials, and data on the environment, air pollution, water and sanitation, occupational health, global environmental change, radiation, etc.				
	<b>World Map Service Global Mosaic</b>	Lucian Plesea			Lucian.Plesea@jpl.nasa.gov http://onearth.jpl.nasa.gov/
	Provides a high-resolution global image mosaic of Earth, produced from more than 8 200 individual Landsat 7 scenes. Also holds SRTM, MODIS and LandSat imagery.				
<b>ANGOLA</b>	<b>Development Workshop (DW) Angola</b>	Allan Cain	RuaReiKatyavala 113 CP 3360 Luanda Angola	T: 244-2448366 F: 244-2449494	dwang@angonet.org http://dw.angonet.org
	The DW Monitoring and Research Unit is an information and knowledge service provider to DW projects, partner organisations and non-governmental and governmental institutions.				
	<b>James Madison University Spatial Information clearinghouse</b>				sic@jmu.edu http://maic.jmu.edu/sic/search.asp
	Gives access to a lot of geospatial data in online and physical libraries and through an information distribution network. Holds aerial and satellite imagery, DTM, DEM, and hydrography, topographic and cadastral data – mostly for sale.				
<b>BOTSWANA</b>	<b>Department of Surveys and Mapping</b>	Bryson Morebodi Lucy Phalaagae		T: 267-3952704	bmorebodi@gov.bw http://www.atlas.gov.bw/
	Photogrammetric data, topographic maps and cadastral data.				
	<b>National Geological Information Centre</b>				http://www.gov.bw/government/divisions.htm#NGIC
	Geological maps of Botswana.				

	<b>National Spatial Data Infrastructure for Botswana</b>	Theresa Sebina	Department of Information Technology Office No. 17, 9th Floor Ministry of Education Building (Block 6) Government Enclave Gaborone	T: 267-3191148 or 3656954 F: 267-3904144	gis.unit@gov.bw <a href="http://www.ngis.gov.bw">http://www.ngis.gov.bw</a>
Metadata provided for all major GIS custodians. Data request service also provided.					
	<b>Botswana National Atlas</b>		Department of Surveys and Mapping P/Bag 0037 Gaborone Botswana		atlas@gov.bw <a href="http://www.atlas.gov.bw/">http://www.atlas.gov.bw/</a>
The Botswana National Atlas is an encyclopaedia of information that significantly improves world-wide knowledge about Botswana. It answers most questions about Botswana's past and present, and questions about the future. As depicted on the artistic cover, this publication also provides reference material for a wide array of disciplines, such as Geography, Education, Culture, Environment and Land Use.					
	<b>Government Statistician</b>		P/Bag 0024 Gaborone Botswana	T: 267-3952200 F: 267-3952201	csobots@gov.bw <a href="http://www.cso.gov.bw/">http://www.cso.gov.bw/</a>
Demographic and statistical database for the whole of Botswana.					
<b>DEMOCRATIC REPUBLIC OF THE CONGO</b>	<b>Central African Regional Programme for the Environment (CARPE)</b>				<a href="http://www.geog.umd.edu/carpe/gisthemes.html">http://www.geog.umd.edu/carpe/gisthemes.html</a>
Data on population, vegetation, climate and protected areas, and satellite imagery.					
<b>LESOTHO</b>	<b>Department of Lands, Surveys and Physical Planning</b>	Offei Akrofi		T: 266-22316038	akrofi@lsp.gov.ls
	<b>Lesotho Bureau of Statistics</b>			T: 266-22323852 F: 266-22310177	director@bos.gov.ls <a href="http://www.bos.gov.ls/">http://www.bos.gov.ls/</a>
Economic, agricultural, social, labour and demographic statistics.					
	<b>SAHIMS country maps</b>				<a href="http://www.sahims.net/gis/gis%20input/GIS_library_lesotho.asp?order=Map_Size">http://www.sahims.net/gis/gis%20input/GIS_library_lesotho.asp?order=Map_Size</a>
Data on roads, administrative boundaries and agro-ecological zones, and meteorological data.					
<b>MADAGASCAR</b>	<b>Foiben-Taosarintanin'i Madagasikara (FTM) – Institut Géographique et Hydrographique National</b>	Joseph Amade	BP 323 Antananarivo 101 Madagascar	T: 261-202222935 F: 261-202225264	dmc@ftm.online.mg
Hydrological and river data.					
<b>MALAWI</b>	<b>Surveys Department</b>	Daniel Gondwe	Surveys Department P/Bag 525 Lilongwe 3 Malawi	T: 265-1-774724 F: 265-1-950510	surveys@sdpn.org.mw
Maps, aerial photographs, cadastral data, geodetic and digital products, digital orthophoto imagery.					



	<b>Malawi Geographic Information Council</b>	Richie Muheya	National Spatial Data Centre, Zowe House P/Bag 311 Lilongwe 3 Malawi	T: 265-1-773622 F: 265-1-933948	nsdc@malawi.net or dnlm_lis@malawi.net <a href="http://www.malawi.gov.mw/nsdc/links.htm">http://www.malawi.gov.mw/nsdc/links.htm</a>
Provides clearinghouse with links to spatial data. Most spatial data resides with the NSDC.					
	<b>Malawi Socio Economic Database</b>				<a href="http://www.maseda.info/">http://www.maseda.info/</a>
	<b>National Statistics Malawi</b>		PO Box 333 Zomba Malawi	T: 265-1-524377	enquiries@statistics.gov.mw <a href="http://www.nso.malawi.net/">http://www.nso.malawi.net/</a>
Census, demographic and poverty data and atlas of social survey.					
<b>MAURITIUS</b>	<b>Survey Division, Ministry of Housing and Lands</b>	P. Uckiah	Cartographic Section Rainbow House Edith Cavell Street Port Louis Mozambique	T: 230-2082831 ext 204	<a href="http://www.gov.mu/portal/site/housing/menuitem.e882294ea39a7a931467c7b148a521ca/?content_id=8b40675ffa058010VgnVCM100000ca6a12acRCRD">http://www.gov.mu/portal/site/housing/menuitem.e882294ea39a7a931467c7b148a521ca/?content_id=8b40675ffa058010VgnVCM100000ca6a12acRCRD</a>
Aerial photography and topographic and cadastral maps at various scales.					
<b>MOZAMBIQUE</b>	<b>GENACARTA – National Centre for Remote Sensing and Cartography</b>	Manuel Ferrao	CENACARTA Maputo		
land-cover maps from Spot and LandSat imagery.					
	<b>Department of Geography, Eduardo Mondlane University</b>	José Rafael	PO Box 257 Maputo Mozambique	T: 258-1-490890 F: 258-1-490890	<a href="http://www.uem.mz/">http://www.uem.mz/</a>
Map data for research, and projects such the Limpopo Basin Atlas.					
	<b>DINAGECA – National Directorate of Geography and Land Tenure</b>	Mr S Dambiane Jose Elias Mucombo		T: 258-1-321804	dinageca@dinageca.gov.mz <a href="http://www.dinageca.gov.mz/">http://www.dinageca.gov.mz/</a>
Maps, aerial photographs, cadastral data, geodetic and digital products and digital orthophoto imagery.					
	<b>SETSAN – Agricultural Research Institute of Mozambique</b>	Marcela Libombo	Av. Das FPLM 2698 PO Box 915 Maputo Mozambique		mllibombo@setsan.org.mz <a href="http://www.setsan.org.mz">www.setsan.org.mz</a>
Primary data on vulnerability assessment, and secondary data on health, poverty, crop production, market price, etc.					
	<b>Statistics Mozambique</b>	Jorge Jose Utui	National Statistics Institute Ave Ahmed Sekou Touré No. 21 Andar Flat 55 Maputo	T: 258-1-494530	jorge.utui@ine.gov.mz <a href="http://www.ine.gov.mz/Ingles/metadados/sumarios/ine">http://www.ine.gov.mz/Ingles/metadados/sumarios/ine</a>
Socio-demographic data for the whole country.					

	<b>MICOA – Department of Conservation Coordination</b>		Sede do Ministério Rua Kassuende 167 Maputo	T: 258-1-492403	<a href="http://www.micoa.gov.mz/">http://www.micoa.gov.mz/</a>
	Electronic copies of GIS maps and information on the Zambezi Delta. MICOA is a new institution, responsible for wetland and biodiversity issues in Mozambique.				
<b>NAMIBIA</b>	<b>Directorate Geological Survey of Namibia – Ministry of Mines and Energy</b>	Anna Nguno	1 Aviation Road P/Bag 13297 Windhoek Namibia	T: 264-61-284811 F: 264-61-249144	
	Annual reports and online listings of all reports, publications, geological maps and geophysical data available for sale – place orders online.				
	<b>Directorate Survey and Mapping – Ministry of Lands &amp; Resettlement</b>	Karim Owolabi		T: 264-61-245056	
	Maps, aerial photographs, cadastral data, geodetic and digital products and digital orthophoto imagery.				
	<b>Ministry of Environment and Tourism</b>				dianed@jafrica.com.na <a href="http://www.met.gov.na/programmes/nnep/gis_data_introduction_page.htm">http://www.met.gov.na/programmes/nnep/gis_data_introduction_page.htm</a>
The GIS layers range from infrastructure data, e.g. on roads, settlements and utilities, to thematic data on various aspects of the physical environment, e.g. land use, soils, vegetation and water.					
	<b>Surveyor-General</b>	G.O. Okafu	45 Robert Mugabe Ave P/Bag 13182 Windhoek Namibia	T: 264-61-2852267	uzookaf@mweb.com.na
<b>SEYCHELLES</b>	<b>GIS Unit, Ministry of Environment and Natural Resources</b>	Justin Prosper	Promenade House English River PO Box 1145 Victoria Mahe Seychelles	T: 248-670418 F: 248-610647	j.prosper@pps.gov.sc or gisdoe@seychelles.net
	Unknown.				
	<b>Centre for GIS, Ministry of Land Use and Habitat</b>	Francis Coeur de Lion	Independence House MLUH Independence Ave PO Box 199 Victoria Mahe Seychelles	T: 248-284502 F: 248-225187	fcoeurdelion@mluh.gov.sc
Unknown.					
<b>SOUTH AFRICA</b>	<b>Agricultural Geo-Referenced Information System (AGIS)</b>	Jimmy Weir-Smith		T: 27-12-3196197	JimmyWS@nda.agric.za <a href="http://www.agis.agric.za/agisweb/agis.html">http://www.agis.agric.za/agisweb/agis.html</a>
	Geo-referenced land, climate, plant nutrient, production and water information, integrated with infrastructural and socio-economic data.				
	<b>Agricultural Research Council (ARC)</b>	Adri Laas			adri@iscw.agric.za <a href="http://www.arc.agric.za/">http://www.arc.agric.za/</a>

<b>Cape Action for People and the Environment (CAPE)</b>				<a href="http://www.capeaction.org.za/">http://www.capeaction.org.za/</a>
Manages spatial biodiversity planning information, and promotes the use of this information by making it freely available on its website.				
<b>Chief Directorate Cadastral Survey</b>	Apie van den Berg			<a href="http://www.csg.pwv.gov.za/">http://www.csg.pwv.gov.za/</a>
Cadastral Information database for South Africa.				
<b>Chief Directorate Surveys and Mapping</b>	Derek Clarke	P/Bag X10 Mowbray 7705 Cape Town	T: 27-21-6584300	dclarke@sli.wcape.gov.za <a href="http://w3sli.wcape.gov.za/">http://w3sli.wcape.gov.za/</a>
Digital and paper geodetic data, topographic maps, aerial photographs, ortho-imagery and satellite imagery. Also holds data for Lesotho and Swaziland.				
<b>City of Johannesburg</b>	Marcelle Hattingh	8th Floor, A Block Metro Centre Braamfontein Johannesburg	T: 27-11-4076181 or 6190	<a href="http://www.joburg.org.za/">http://www.joburg.org.za/</a>
Datasets (corporate and other); standard, customised and interactive maps; digital data; property information; CD products; and internet map access.				
<b>Council for Geosciences</b>	Mr D Barnado	280 Pretoria Street Silverton Pretoria South Africa	T: 27-12-8411911	barnardo@geoscience.org.za <a href="http://www.geoscience.org.za/">http://www.geoscience.org.za/</a>
Geological Maps of South Africa and some neighbouring states, geophysical atlases and mineral maps.				
<b>Department of Environmental Affairs</b>	Deon Marias	P/Bag X447 Pretoria	T: 27-12-861112468	<a href="http://www.deat.gov.za/">http://www.deat.gov.za/</a>
Maps and imagery, e.g. SOER and ENPAT maps, and GIS Datasets.				
<b>Department of Water Affairs Map Shop</b>	A.C. Cochlovius Gouws			raa@dwaf.pwv.gov.za <a href="http://www.dwaf.gov.za/BI/Mapshop/">http://www.dwaf.gov.za/BI/Mapshop/</a>
Maps and imagery, e.g. orthophotos of hydrology, water management areas and strategic environmental assessments.				
<b>eThekweni-Durban Metro</b>	Dr Mike Sutcliffe			irelandt@durban.gov.za <a href="http://citymaps.durban.gov.za/">http://citymaps.durban.gov.za/</a>
Municipal maps, cadastre and imagery on infrastructure, services, boundaries, etc.				
<b>GIS Department, City of Cape Town</b>	Dr Solomon Bhunu	CMC Administration Wale Street Cape Town	T: 27-21-4872262 F: 27-21-4872269	Solomon.Bhunu@capetown.gov.za <a href="http://www.capetown.gov.za">http://www.capetown.gov.za</a>
Digital aerial photography and other imagery, web maps, informal settlement survey data, Digital Elevation Model (DEM) for Cape Town, Town Survey Reference Mark Data Base and Land Use Data Base.				
<b>GIS Centre, Human Sciences Research Council</b>	Craig Schwabe	P/Bag X41 Pretoria 0001 South Africa	T: 27-12-3022600 F: 27-12-3022525	caschwabwe@hsrc.ac.za <a href="http://www.hsrc.ac.za/">http://www.hsrc.ac.za/</a>
Statistics, maps on poverty and census data.				
<b>Medical Research Council</b>	Carrin Martin	P.O Box 70380 Overport 4091 South Africa	T: 27-31-2034700	martinc@mrc.ac.za <a href="http://www.mrc.ac.za/services/giscentre.htm">http://www.mrc.ac.za/services/giscentre.htm</a>
Population statistics and health and hospital data for South Africa.				
<b>Municipal Demarcation Board</b>	Nic Scheepers			<a href="http://www.demarcation.org.za/">http://www.demarcation.org.za/</a>
Maps of all municipal boundaries from ward level upward. Provides SA-Explorer web-based map tool.				

<b>National Disaster Management Spatial Data Fountain</b>				<a href="http://ndmcgis.pwv.gov.za/website/dev/viewer.htm">http://ndmcgis.pwv.gov.za/website/dev/viewer.htm</a>
Web Map Viewer of various GIS layers including administrative boundaries, population, transportation, priority development areas, hydrology, etc.				
<b>National Spatial Information Framework</b>	Abigail Thabethe	184 Jacob Mare Street P/Bag X833 Pretoria 0001 South Africa	T: 27-12-3129256 F: 27-12-3265187	athabethe@dla.gov.za <a href="http://www.nsisf.org.za/">http://www.nsisf.org.za/</a>
Metadata that can be sourced through the spatial data discovery facility. Also provides links to other relevant sources.				
<b>Satellite Applications Centre</b>	Mothibi Ramusi		T: 27-12-3345002 F: 27-12-8412689	mramusi@csir.co.za <a href="http://www.csir.co.za/plsql/ptl0002/PTL0002_PGE005_DIVISIONS?DIVISION_NO=7209624">http://www.csir.co.za/plsql/ptl0002/PTL0002_PGE005_DIVISIONS?DIVISION_NO=7209624</a>
LandSat 5 and 7 (free of charge), MODIS, SPOT 2 and 4, EROS A1, ERS, IKONOS and Quickbird imagery.				
<b>Statistics South Africa</b>	Dr Liz Gavin		T: 27-12-3108028	lizg@statssa.gov.za <a href="http://www.statssa.gov.za/">http://www.statssa.gov.za/</a>
Demographic data, census data and household survey data for South Africa.				
<b>TrigNet</b>	Patrick Vorster	P/Bag X10 Mowbray 7705 Cape Town	T: 27-21-6584300	trignet@sli.wcape.gov.za?subject=Website%20Enquiry <a href="http://www.trignet.co.za/">http://www.trignet.co.za/</a>
Municipal maps, aerial photographs and satellite imagery of infrastructure, cadastre, services and boundaries.				
<b>Tshwane Metro</b>	Rick Krogh			rickk@tshwane.gov.za <a href="http://www.tshwane.gov.za/">http://www.tshwane.gov.za/</a>
Permanent GPS base stations.				
<b>SWAZILAND</b>	<b>Department of the Surveyor-General</b>	Albert Mahlangu	Department of the Surveyor-General Ministry of Natural Resources and Environment PO Box 4700 Mbabane Swaziland	T: 268-4042386 (no area code)  sgd@realnet.co.sz
Topographic and cadastral data, aerial photography and satellite imagery for the whole country.				
<b>TANZANIA</b>	<b>Cartographic Association of Tanzania</b>	Ruger Kahwa	PO Box 78448 Dar Es Salaam Tanzania	T: 255-22-5116136
Maps.				
	<b>Surveys and Mapping Division</b>	Lazarus Moller	Director Surveys and Mapping Division PO Box 9201 Dar Es Salaam Tanzania	T: 255-22-2121894 or 5121894 or 5121241 F: 255-22-2138962  smd@raha.com
Topographic and cadastral data.				

	<b>Tanzania Socio Economic Database</b>				<a href="http://www.tsed.org/">http://www.tsed.org/</a>
	Aims to democratise access, use and dissemination of accurate and up-to-date data on a wide range of socio-economic topics, in a user-friendly way, especially to aid policy-making.				
<b>ZAMBIA</b>	<b>Electoral Commission of Zambia</b>		PO Box 50274 Lusaka Zambia		
	GIS-based maps at scales ranging from 1:50 000 to 1:250 000.				
	<b>Environmental Conservation Association of Zambia</b>		PO Box 30395 Lusaka Zambia	T: 260-1-252649 F: 260-1-252648	ecaz@zamnet.zm <a href="http://www.ecaz.co.zm/">http://www.ecaz.co.zm/</a>
	Land and agriculture data.				
	<b>Environmental Council of Zambia</b>		P/Bag E89i Lusaka Zambia	T: 260-1-254130 F: 260-1-254164	ecz@necz.org.zm <a href="http://www.necz.org.zm">http://www.necz.org.zm</a>
	Satellite images and hard-copy maps.				
	<b>FAO (Zambia)</b>		PO Box 30563 Lusaka Zambia	T: 260-1-252568 F: 260-1-254173	unfao@zamnet.zm <a href="http://www.fao.org">http://www.fao.org</a>
	Food and agriculture data.				
	<b>Geological Survey of Zambia</b>	Zuze Dulanya			<a href="http://www.zambia-mining.com/geology.html">http://www.zambia-mining.com/geology.html</a>
	Data covering the geology of Zambia (pdf and jpeg formats).				
	<b>Leadership for Environment and Development, Zambia</b>		PO Box RW50271 Lusaka, Zambia	T: 260-1-261532 F: 260-1-261928	lead@zamnet.zm <a href="http://www.lead.org">http://www.lead.org</a>
	Network for environmental and sustainable development in Africa.				
	<b>Ministry of Agriculture and Cooperatives</b>		PO Box 50595 Lusaka Zambia	T: 260-1-253933	pcd@maf.gov.zm <a href="http://www.agriculture.gov.zm">http://www.agriculture.gov.zm</a>
	Agricultural data.				
	<b>Ministry of Energy and Water Development</b>		PO Box 36079 Lusaka Zambia	T: 260-1-251337 F: 260-1-254491	emx@zamnet.zm <a href="http://www.energy.gov.zm">http://www.energy.gov.zm</a>
	Energy and powerline data.				
	<b>Ministry of Tourism, Environment and Natural Resources</b>		PO Box 30050 Lusaka Zambia		
	The national topographic database is being designed to serve as the basic platform for extended development of spatial database standards. The new system will support GIS applications.				
	<b>National Water Supply and Sanitation Council</b>		PO Box 34358 Lusaka Zambia	T: 260-1-226941 F: 260-1-226904	nwasco@zamnet.zm <a href="http://www.zambia-water.org.zm">http://www.zambia-water.org.zm</a>
	Water data.				
	<b>Zambian Association of Geographic Information Systems</b>		Postnet Suite No. 336	T: 260-1-293838 F: 260-1-293848	info@zagis.org.zm <a href="http://www.zagis.org.zm">http://www.zagis.org.zm</a>
	A GIS environment with maps covering the Zambezi River Basin, Zambian weeds, environmental conditions, pollution, waste management and RAMAR Sites.				
	<b>Zambian Statistics</b>				Info@Zamstats.gov.zm <a href="http://www.zamstats.gov.zm/">http://www.zamstats.gov.zm/</a>
	Data on water, unemployment, life expectancy, mortality, etc.				
	<b>Zambia Survey Department</b>	Surveyor-General, Mr Bwalya Chuba	PO Box 50397 Lusaka Zambia		chuba00509@alumni.itc.nl or chuba@zasurvey.org.zm
	Satellite imagery, topographic and cadastral data and ortho-imagery.				

<b>ZIMBABWE</b>	<b>CGIAR Datasets for Zimbabwe</b>				<a href="http://www.grida.no/cgiar/htmls/afsouth.htm">http://www.grida.no/cgiar/htmls/afsouth.htm</a>
	Metadata on roads and agro-ecology.				
	<b>Department of the Surveyor-General</b>	Edwin Guvaza Tabitha Chima	49 Samora Machel Ave PO Box CY540 Causeway Harare Zimbabwe	T: 263-4-775550 / 2 F: 263-4-780808	dguvaza@dsg.co.zw tchima@dsg.co.zw
	Satellite imagery, topographic and cadastral data, ortho-imagery.				
	<b>Forestry Commission of Zimbabwe</b>	Dominic Kwesha	Forestry Research and Development 1 Orange Grove Drive PO Box HG595 Highlands Harare Zimbabwe	T: 263-4-496878 / 9 F: 263-4-497070	vegris@harare.iafrica.com <a href="http://www.forestrycommission.co.zw/research/products_services.htm">http://www.forestrycommission.co.zw/research/products_services.htm</a>
	Satellite images, vegetation maps, hardcopy data and digital maps on land cover.				
	<b>Initiative for Development and Equality in Agriculture (IDEAA)</b>	Dr Ruvimbo Mabeza-Chimedza	IDEAA Africa-wide Data Office Department of Agricultural Economics and Extension University of Zimbabwe PO Box MP167 Mount Pleasant Harare ZIMBABWE	T: 263-4-303544 or 339228 F: 263-4-303544	
	Information on policy analysis and model-building, GIS and priority-setting, electronic databasing and networking.				
	<b>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</b>	Pierre Traoré	Matopos Research Station PO Box 776 Bulawayo Zimbabwe	T: 263-9-838311 F: 263-9-838253	icrisatzw@cgiar.org, <a href="http://www.icrisat.org/">http://www.icrisat.org/</a>
	Research data and reports on request.				
<b>SAHIMS GIS Library</b>					
Data on wards, foods and crops, administrative boundaries, cities, rivers, etc.					
<b>Scientific and Industrial Research and Development Centre (SIRDC)</b>	George Kwenda		T: 263-4-860321 / 9	gkwenda@sirdc.aczw	
Zimbabwe's environment and remote sensing institute. Provides satellite imagery and topographic data.					