

CLIMATE CHANGE

DESERTIFICATION

# RIIS

Regional Integrated  
Information System,  
Phase II

# East Africa

- CAPACITY BUILDING
- NETWORKING
- TRANS-NATIONALITY





## Background and rationale

In 1996, with the financial support of the Governments of Italy and the USA, a project profile was conceived on the development of a Regional Integrated Information System (RIIS). This stemmed from a participatory process, and aimed at the design of a mechanism to improve access to and increase sharing of data/information on environmental and natural resources in the IGAD (Intergovernmental Authority on Development) region. The *Istituto Agronomico per l'Oltremare* (IAO), a branch of the Italian Ministry of Foreign Affairs, was involved during this phase. Outputs were:

- a Needs Assessment Survey;
- RIIS Web-site;
- a Prototype Clearinghouse (CH), set up at the Institute of Computer Science of the University of Nairobi (ICS/UoN).

Subsequently, a full-fledged programme (RIIS Phase II) was formulated, through the organisation of national seminars, with the active participation of institutions with both an environmental management and an Information Technology background. The Project rationale lies in the many obstacles hampering effective sharing of environmental information: lack of primary data and/or data incompatible for analysis and use, institutions manipulating geographic data and describing geographic features in different ways, data which

are not in a digital format, a number of institutions acting in an uncoordinated way, failure to update or manage databases, the prevalence of a culture of secrecy, telecommunication services with different levels of development. At the same time, it is evident that the effective sharing of information requires the adoption of standards and operations that provide a framework for "inter-operability". It also demands a common view, common abstractions and feature representations as well as standardised meta-data.

The six countries included in the proposal (Somalia is not participating as the political situation in the country remains uncertain) are at different levels of development in IT policies and infrastructure, and have different complexities in their respective institutional, political and cultural frameworks.

RIIS is a policy-neutral tool. It is believed, however, that an efficient technical instrument should be able to indirectly influence changes in policy by increasing trust and confidence in its effectiveness. It will facilitate the development and harmonisation of IT and environmental policies in the region, as technology will be increasingly demanded to improve the efficiency of the system, fostering confidence and trust by relevant stakeholders, decision-makers and other development actors.

Overcoming the gaps in information technology means addressing political and institutional aspects through technology. However, the Project is not based upon technology



as a panacea, but rather on its best use and adaptability to specific country situations, supported by the development of an appropriate institutional and regulatory framework. Only if the two elements run in parallel, each feeding the other, it will be possible to overcome the general feeling of suspicion related to data sharing. Only in this way it will be possible to build consensus and confidence in RIIS as a system for the exchange of information, and to utilise it for sounder planning in the sustainable use of natural resources, protection of the environment and food security. The RIIS will also provide real-time analysis supporting rapid and informed decision-making, especially when emergencies occur and food security is at stake. RIIS can be designed to support prompt reaction to emergencies by deploying tools and predictive models to ease and speed up these operations. The Project is estimated to last three years with a budget of about 3 million US\$ from the Italian Cooperation and a planned US\$ 500,000 as contribution in kind by the recipient IGAD member States.

*East Africa, highland agricultural production*



# Goal, objectives and expected outputs

The overall goal of the RIIS Project is to contribute to food security and environmental protection by strengthening regional and national capacities in the use and management of information and by reducing the digital divide in the IGAD Region.

## The Project's specific objectives are the following.

- ➊ Improve access to and exchange of geo-referenced data in the IGAD Region.
- ➋ Support the decision-making process through appropriate data analysis tools, to provide timely information to users/clients and operators.

## The expected outputs are as follows.

- ➊ An institutional and regulatory framework for a Regional Integrated Information System in place.
- ➋ A RIIS Web-page portal and the Web-pages of participating institutions developed or up-dated and maintained according to RIIS standards and protocols.
- ➌ A Clearinghouse with national node(s) operational according to RIIS standards and protocols.
- ➍ Tools (warehouse) and methodologies (Decision Support Systems) adopted and used for analysis aggregation and the processing of primary data to facilitate decision-making.
- ➎ National and regional capacities in data management strengthened through an overall training programme that covers the definition of standards and protocols, the creation and maintenance of Web-pages and Clearinghouse nodes, and data analysis and processing.
- ➏ Sustainability of the RIIS network ensured.

## The RIIS is designed as a:

- ➊ facilitator for the Information Community to access, share and analyse data and produce information through a "mix-and-match" of technology and regulatory tools;
- ➋ vehicle to carry data along a defined and regular route to the target or end-users;
- ➌ co-ordinator or point of reference for other data/information initiatives in the region;
- ➍ stimulator for filling the gaps in data availability and for enhancing the production of quality data.

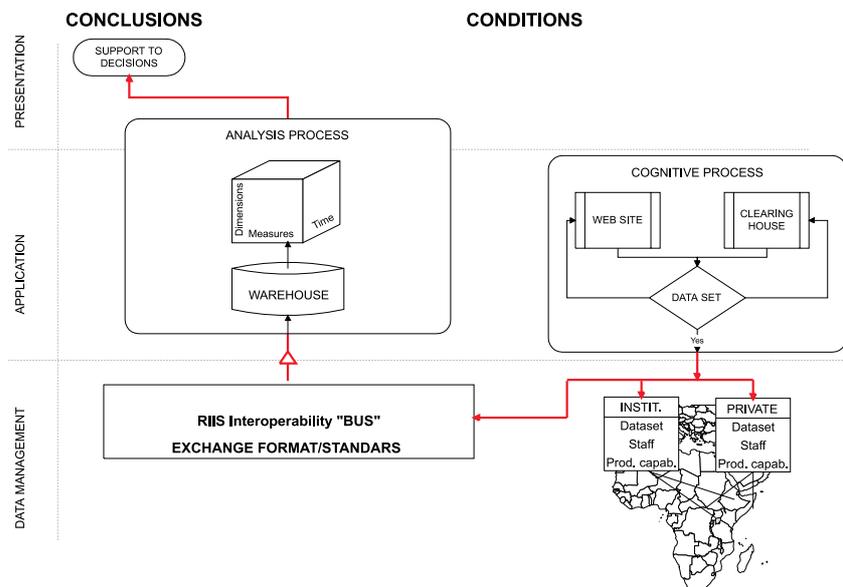
The system: a) strengthens data handling capabilities at a national level; b) facilitates access, sharing and analysis of environmental data/information; c) allows data producers to retain power and property over their databases; d) allows data holders to establish the level of access to data (security); e) allows for connections to be opened to as many remote databases as necessary, including those containing information on the region but located elsewhere; f) by highlighting gaps, overlaps and quality problems, it stimulates the production process; g) fosters the creation of an Information Community, which discusses and adopts standards, protocols, agreements; h) facilitates the coordination and integration of national and regional activities related to information systems.



The RIIS is proposed as an integrated information system to access and share environmentally-based information; it is decentralised at a national level; it is built in accordance with a multi-component approach, in which each component is independent and benefits from the latest available technology (envisaging the extensive use of Internet), adapted to specific country situations. The three components are the following.

- ➊ **The cognitive process:** a fast and complete enquiry system to approach data holders/providers and to acquire knowledge about the consistency of data (mainly geo-referenced data) in both quantitative and qualitative terms. Internet-search engines are utilised to query the system, specifically Web-pages and the Clearinghouse. While Web-pages provide up-to-date information which enables the user/client to be informed about the existence of the providers/holders, the

## The RIIS can be visualised in the following way:



Clearinghouse, accessed from a link on the Web-pages, provides on-line access to the holders' metadata. A Clearinghouse may be defined as a decentralised system of searchable Internet servers (nodes) holding metadata records (files).

- **The exchange process:** a RIIS Interoperability BUS permits the harmonisation of formats and standards providing a regulatory framework and a mechanism for data exchange and communication. It will enable users to access and process geo-referenced data from a variety of sources on the Internet by querying and opening connections to remote databases and controlling the remote processing resources.
- **The analysis process:** a spatial data warehouse and an analytical data processor are provided to study and analyse data and present conclusions (Warehouse, Analytical Tools) through open connections of remote databases, in order to facilitate decision-making in environmental and natural resources management. In particular, these tools are provided to: develop solutions which are independent from the applications; emphasise data and quality of data production rather than data presentation (which is another close link with an application-based system); support decision-making and planning, mainly providing the right neutral answer at the right moment to decision-makers.



*East Africa,  
the Great Rift Valley*

## Institutional set-up

Institutions willing to adhere to RIIS must be ready to accept a number of features and rules which grant participation in the Information Community. An institution (data holder) qualifies to become a RIIS National Node (NN) when it meets basic requirements, i.e. when it owns:

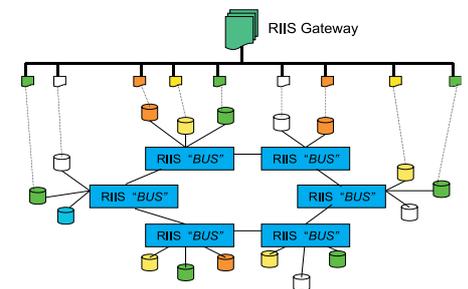
- metadata that describe a digital geo-spatial data set stored either in text files or in a database matching the RIIS Content Standards and provided in formatted text or marked-up in Standard Generalised Mark-up Language (SGML);
- computer hardware to store the indexed metadata and is connected to the Internet on a 24/7 basis with specific Internet address;
- software that supports access to metadata using the RIIS Profile;
- software or procedures that validate the metadata contents.

However, failure to fully meet the above requirements does not automatically exclude the data holder from the system, as its metadata may

be placed (housed) on any other node or Web-server, in which case they become Virtual Nodes (VNs).

### The RIIS Information Community

The process of standardisation will not be exhausted within the Project timeframe. But RIIS will have accomplished its objective if the mechanism is functioning efficiently and is kept alive through technical commissions, open forums and institutional networks, all of which will move the process forward. Institutional arrangements are key to the smooth implementation of the Project. During the Formulation Mission, the RIIS Team has discussed with participating institutions the advantages and disadvantages of institutional alternatives. Consensus has always been reached about the importance of identifying an appropriate hosting agency for the national implementation units, in order to ensure sustainability, create a sense of ownership of RIIS at the country levels and make a rational use of limited resources. As a lack of skills has been indicated as a critical element, an intense training programme has been developed. Workshops, seminars, a series of case studies and a pilot application will serve as additional elements of training, to demonstrate the efficacy and efficiency of the RIIS system.



*Ethiopia,  
Menagesha  
Natural Park*