



RCMRD

Regional Centre for Mapping of Resources for Development



Regional Centre for Mapping of Resources for Development

Annual Report 2006



Dr. Wilber K. Ottichilo
DIRECTOR - GENERAL

The year 2006 marked the end of the implementation of the Centre's 2003 – 2006 Business Plan. The year's activities focused mainly on capacity building of the Centre and member States in the application of geo-information technologies in sustainable development. The activities undertaken were: conducting of various customer tailored and application training courses, implementation of various projects, research and development, infrastructure and staff development at the Centre; coordinated the ECA study on the restructuring of the management structure of the Centre, preparation of the 2007 to 2010 Strategic Plan, the organization and convening of the 5th Conference of Ministers and 41st Governing Council and marketing of the Centre's services and products.

During the year, 434 nationals from 15 countries were trained in various geo-information courses and 175 students were trained at certificate and diploma levels in Information A number of projects were implemented during the year. Among the projects were: Survey of boundary delineation of plantation and indigenous forest in Mt. Kenya (UNEP funded), mapping and development of database for 17 towns around lake Victoria (UN-Habitat funded), generation of digital spatial maps and image mosaics for Lake Victoria (funded by EU), development and mapping of administrative boundaries, constituencies, polling stations, road network, drainage and service centres for Kenya Electoral Commission, gum and resins mapping in Karamoja area in Uganda (funded by Uganda government), establishment of GIS facility and development of spatial database for the city of Kampala (funded by UN-Habitat), preparation of areport on agro-pastoralists in the Greater Horn of Africa (funded by WFP) and coordination of the implementation of Africa Reference Frame project. During the year two research and development projects were undertaken. These were: Lake Victoria Lake level and Water Quality Study Using

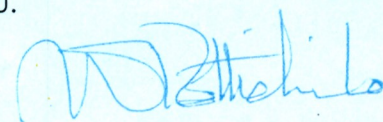
Remote Sensing Techniques and Assessment of groundwater potential in the Rift Valley and mapping its Vulnerability to Pollution. The Lake Victoria project was jointly implemented by the Center and Vixel Ltd of the Netherlands with funding from European Space Agency (ESA) under the TIGER Initiative. The Rift Valley project was jointly conducted with Nairobi and Kenyatta Universities and was funded by French Ministry of Foreign Affairs.

Capacity building at the Centre entailed the improvement of ICT and physical infrastructure and development of our human resources. The ICT improvement included the installation of some open source software, upgrading of the Internet bandwidth from 256 kbps to 1024 kbps, procurement of computers, installation of satellite data receiving station and FAO Geo-Network data service. As regard staff capacity building, all staff were trained in performance management and leadership and some attended short-term professional training courses while some registered for self-sponsored diploma and degree courses.

Both the 5th Conference of Ministers and 41st Governing Council Meetings were held in Malawi in November 2006 and were attended by ten member States. During the conference of Ministers the achievements of the implementation of the 2003-2006. Business Plan were reported and endorsed, a new Strategic Plan (2007 – 2010) was launched and the Republic of South Africa was admitted as a new member of the Centre. The Governing Council discussed and endorsed a new organizational structure for the Centre.

Overall, the Centre made significant achievements during the year, particularly in training, project implementation and institutional capacity building as well as marketing of its services and products. This was possible due the support we received from our member States, development partners, clients and staff. I take this opportunity to thank them all and appeal to them to support the successful implementation of the Centre's 2007 – 2010 Strategic Plan.

Thank you.



Dr. Wilber K. Ottichilo
DIRECTOR - GENERAL

REMOTE SENSING AND ENVIRONMENTAL MANAGEMENT PROGRAMME (RSEMP)

Projects Implemented

During the reporting period, RSEMP implemented several projects, some carried forward from 2005. The projects include the following:

Participatory Forest Cover Mapping and Change Detection in Loita Purko community forest, Kenya:

The project was undertaken using a Participatory GIS Approach, and funded by the World Conservation Union (IUCN). The Centre implemented the project in collaboration with a Maasai Community Based Organization (CBO) called the Loita / Purko Naimina Enkiyo Forest Project, beginning with a Pilot Phase that entailed mapping part of the Loita Forest. Landsat satellite imagery of the pilot project area acquired in 1991 and 2003 were used to map changes in forest cover. The project was successfully executed and the deliverables were handed over to the clients in time.

Urban Mapping of 10 State Capitals in Southern Sudan:

The main objectives of the project were (i) to produce a base map for the ten state capitals in Southern Sudan and develop a spatial database; (ii) to build the local capacity for sustainable use of geoinformation technology in day-to-day urban planning and management activities; and (iii) to establish geodetic control points for mapping and engineering activities in the towns. Quickbird satellite data was used as a base to develop the spatial database including the town map. The consultancy project was financed by USAID with Creative Associates International INC (CAII) as the main contractor. Some of the maps produced under this project are found on this website www.southsudanmaps.org of the Ministry of Lands, Housing and Public Utility, Government of Southern Sudan.

Map / Survey of the Boundary delineation of Plantation and Indigenous Forests in Mt. Kenya are a:

The Mount Kenya forest mapping and boundary delineation project was sponsored by UNEP and awarded to the Centre in August,

2005. The project dealt with delineation of boundary between plantation and indigenous forests in order to have a clear definition of responsibilities between Kenyan Wildlife Service (KWS) and Forest Department (FD). The remote sensing part of the project was undertaken by the RSEMP and completed in December, 2006.

Safaricom Network Infrastructure and Demographic Mapping Solution project:

This consultancy project was implemented on behalf of the Safaricom Plc., Kenya, a private mobile telephone operating company to assess potential expansion areas for the mobile telephone network and to identify potential markets. In this project, an analysis of location of barriers, population distribution and density, base LANDSAT image, population settlement areas like towns, cities and villages, educational institutions location and road network mapping were undertaken. The project was completed, the spatial database developed and results of the analysis were handed over to the clients.

Lake Victoria Fisheries Organization (LVFO) Project for Generating Digital Spatial Maps and Image Mosaic for Lake Victoria and Its Surroundings:

The LVFO project was funded by the European Union aimed at production of a spatial database and mapping of fish landing sites, fish processing factories around the lake. The main outputs of the project were maps and the spatial database. The database contains road network, towns, land-use / land cover map, wetland map, fish landing sites, fish factories, DEM, bathymetry, map of islands greater than one square kilometre in area, administrative boundaries from national to sub-location level, and a mosaic of Landsat ETM+ image. The project was completed and the deliverables were handed over to the LVFO.



Landing sites mapping around lake Victoria

The focal countries are Sudan, Ethiopia, Kenya and Uganda. The major phase of crop area mapping and ground truthing was conducted for Sudan and the next field data collection and ground truthing will be conducted in Ethiopia. A capacity building component of the project is being implemented through training of staff members of the Bureau of Statistics and Ministry of Agriculture in the respective countries.

Kampala City Council (KCC) Project:

In collaboration with the UN-Habitat and the Municipality of Kampala City, the Centre implemented a GIS project that focused on spatial database development and capacity building for the Kampala Municipality. Most of the analogue data of the town planning section were converted to digital formats and the database were edited. New Quickbird satellite imagery was acquired for Kampala city, and a complete and updated town map was prepared. One month training was offered to members of the Municipality and other relevant organizations in Uganda. The training covered some basic remote sensing data processing, Quickbird data interpretation, database management, GPS reading, geo-referenced data collection, scanning and digitizing, and map preparation and printing.

Gum and Resins Mapping in Karamoja Area, Uganda:

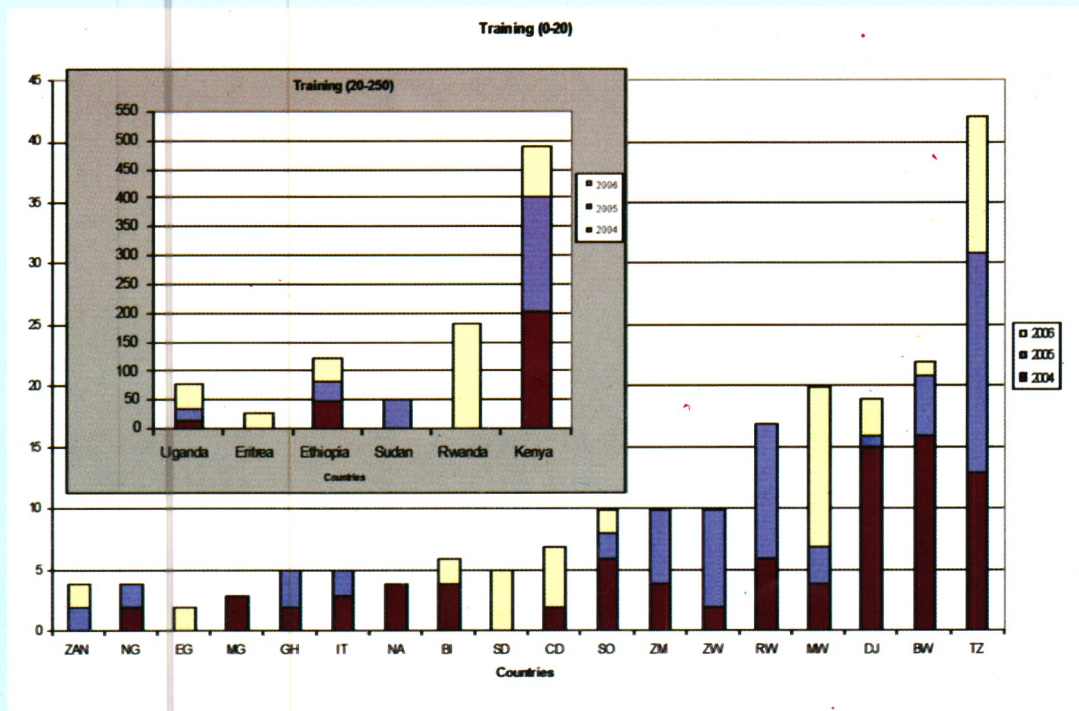
The arid land products Gum and Resins and other forest resources in Karamoja were mapped at larger scale from Landsat and SPOT images. The project was funded by the Ugandan Government through the office of the president of Uganda. The ground truthing and identification of the trees were done in collaboration with NGARA, and the project deliverables were submitted to the clients for their evaluation.

Monthly Preparation and Dissemination of the Greater Horn of Africa (GHA) Early Warning Bulletin on Food Security:

This activity was started in 2002 and is still on-going. It is a joint activity between the Centre and its partners (FEWSNET, IGAD Climate Prediction and Applications Centre-ICPAC, International Livestock Research Institute- ILRI, United Nations World Food Programme, United States Geological Survey –USGS, Desert Locust Control Organization-DLCO and USAID).

Training

During the reporting year, the RSEMP organized and conducted several regular and tailor-



Above is a sampled country comparative chart of trainees for the years 2004, 2005 and 2006. Note that any country that did not have above two persons in at least one of the three years does not appear on the chart.

Distribution and Sale of Satellite images and Other Spatial Data

GeoNetwork:

The RCMRD Geo-Network Node that contains spatial data on Agriculture in Africa donated by FAO was installed and running online. Data and metadata are being freely disseminated via this node to interested researchers or institutions in Africa. Metadata of the data from the Centre is also found on this Node. The RSEMP together with the GMFS, ESA are constantly updating the node and maintaining the site.

Satellite Data Receiving Station:

In collaboration with ESA, the Centre installed a Satellite Data Receiving Station for directly receiving medium resolution satellite data in real time with other processed products. This facility will increase data receiving capacity from partners in Europe and track some of the low resolution satellite data in real time.

Physical Data Archive:

A physical data archiving facility (fire and water proof and humidity and temperature controlled room) has been built for backup data archive of the Centre.

Satellite Data Distribution / Sale:

Landsat, SPOT, QuickBird, IKONOS satellite images have been distributed to different users during the reporting period. Among the clients were GIBB Africa, ICRAF, USAID-S. Sudan. A total of about US\$ 130,000 was realized from the distribution / sale.

RESOURCE MAPPING PROGRAMME

Training

The Resource Mapping (RM) Programme participated in all the training courses offered by the Remote Sensing and Environmental Mapping Programme by providing GPS training. The programme organized two training courses in each of the following: GPS, digital photogrammetry and digital cartography. Two regional courses on African Reference Frame (AFREF) and Global Navigation Satellite

System (GNSS) data processing and digital photogrammetry were held in October 2006. In addition, RM provided the following training courses outside RCMRD:

- 2 weeks GPS and Total Station training in Malawi
- Kenya Institute of Surveying and Mapping Third Country Training for Eastern and Southern African countries course in GNSS.

The programme also completed the development of its training curriculum for a new course in digital photogrammetry.



Field work during GPS training held in Malawi

Projects implemented

During the reporting period, the programme implemented the following projects:

African Reference Frame:

A technical workshop was held at the University of Cape Town, South Africa in July 2006. It drew participation from 30 African states, mostly national mapping organisations. World-renowned scientists in GNSS technologies attended and shared their knowledge and experiences. Modalities for the implementation of AFREF were discussed, such as the setting up of tracking stations, data analysis and data holding centres. At the workshop eleven countries, namely, Malawi, Nigeria, Tanzania, Namibia, Cameroon, Ghana, Morocco, Mozambique, Benin, Ethiopia and Egypt committed to establishing one Continuous Operating Reference Station by the end of 2006.

and equipment to undertake the survey in eight districts.

Monitoring Survey of Kamburu Dam:

A precise survey to monitor the Kamburu dam gate was carried out in September, 2006. The dam, which is on Tana River in Kenya, is used for generation of hydro-electric power. The gate had problems in closing and opening and it was suspected that deformations were taking place. The task, which entailed the carrying out of precise surveys on relevant paths and beams used by the sliding gates, was completed in October 2006.

Oza Ranch Survey:

The project involved the cadastral survey of a 30,000 acres ranch in Kenya using GPS technology. The survey was completed in July, 2006.

Survey of Tunnel for Hydro-Power Project:

This was an engineering survey for the setting up of a two Kilometre penstock tunnel for the Sondu-Miriu Power project in Kenya lasting three weeks and completed in December, 2006.

Capacity Building of the Programme

The following facilities were established at the RCMRD:

- Photogrammetric lab
- Geodetic Lab
- Continuous Operating Reference Station

ENGINEERING SERVICES

During the reporting period the Engineering Section undertook the following activities in the Ministry of Lands in each respective country:

Service Missions

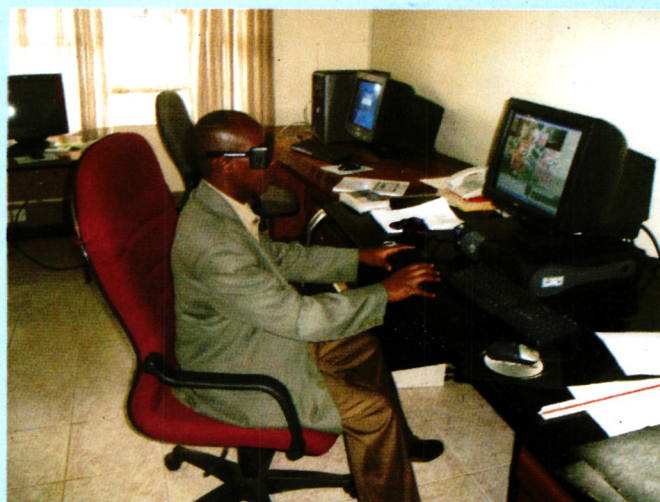
Namibia:

During a two weeks mission in March, 2006, twenty four surveying instruments were serviced and calibrated. The cost of service was US\$

9,500.00 in comparison to a replacement value of US\$ 143,300.00

Botswana:

The section rendered service to Botswana in two missions. At the first mission from 27 March – 07 April, 2006, forty-eight surveying instruments were serviced and calibrated. The cost of service was US\$ 24,800.00 as compared to a replacement value of US\$ 204,600.00. At the second mission, 03 – 14 April, 2006, the section



Digital photogrammetric laboratory

serviced three photogrammetric equipments at a cost of US\$ 9,000.00. The replacement value of the same equipment is US\$ 45,000.00

Malawi:

The section rendered services to Malawi for two weeks in September, 2006. Twenty three instruments were serviced and calibrated. The cost of service was 13,240 while the replacement cost is US \$ 160,000.00

Uganda:

In a three weeks mission (18 September – 04 October, 2006), the section serviced four photogrammetric equipments, namely, one A10, one B8 and two A8 for the Uganda government. The cost of service was US\$ 4,800, while replacement value is US\$ 120,000.00

Tanzania:

Thirty two surveying instruments were serviced and calibrated during a two weeks mission in

Other Highlights

- A recreational facility with indoor games was opened for students.
- September, 2006 saw the rolling out of the new Certificate/Diploma in IT Syllabi
- In September, 2006, ITTC won a contract at Sustainable Aid in Africa (SANA) International to, first, design, develop and implement a Management Information System (MIS) for process monitoring and evaluation of their projects. Second was IT capacity building for SANA staff.
- In October, 2006, upon recommendation by ITTC, 27 assorted books on HIV/Aids were acquired for the Centre that are in line with the new IT Diploma / Certificate syllabus requirements.

MANAGEMENT ACTIVITIES

During the year under review, the Management focused on several major activities. Key among them were the implementation of the final phase of the 2003-2006 Business Plan; preparation of the Strategic Plan for the next four years (2007-2010); review of the Operational Structures; and convening of the Conference of Ministers and Governing Council meetings.

2003 – 2006 Business Plan

The year 2006 marked the end of the 2003-2006 Business Plan. The successful implementation of the 2003 – 2006 Business Plan was attributed to the support given to the Management by the member States through prompt remittance of annual contributions and use of the Centre's services. It was also as a result of the support the Centre received from its development partners as well as clients. The dedication and hard work of the Director General, Management, and staff of the Centre resulted in the transformation of the Centre into a Centre of Excellence in Geo-Information applications.

2007 – 2010 Strategic Plan

The 2007 - 2010 Strategic Plan whose theme is to "Promote the development, application and dissemination of Geoinformation for sustainable development in Africa", was officially launched at the 5th session of the Conference of Ministers in November, 2006. The goal of the Plan is to maintain the achievements that were realized as a result

of the restructuring of the Centre and propel it to further growth. The Plan addresses the rapidly changing technologies and increasing demands of information for development planning in line with the Millennium Development Goals (MDG). It also focuses on building capacity and forming networks of partners dealing with Geoinformation research for sustainable development. The successful implementation of the 2007 - 2010 Plan will depend on the needed support of member States and development partners as well as the commitment of the management and staff of the Centre.

Conference of Ministers and The Governing Council

The Conference of Ministers, which is the overall policy organ of the Centre, meets every four years to review and approve the implementation of the Centre's development plans. The 5th Conference of Ministers was held at Club Makokola in Mangochi, Malawi from 20 – 21 November 2006. The meeting was preceded by the 40th meeting of the Governing Council that took place from 16 - 19 November 2005 at the same venue.

During the Conference, the outgoing chairperson, Hon. Jerry Ekanjio, Minister for Lands, Housing and Surveys, Republic of Namibia presented his report which highlighted the achievements made by the Centre since Namibia was elected Chair of the 4th Conference of Ministers during the meeting held in Namibia in December, 2002. In his report the outgoing Chairperson attributed the phenomenal growth experienced by the Centre in the last four years to the effort made by H.E. the President of Namibia, Hon. Hifikepunye Pohamba, who was then the Minister of Lands, Resettlement and Rehabilitation, and Chairperson of the Conference of Ministers until March, 2005 when he was elected President of Namibia. During that time, the Chairperson visited the member States and appealed to them to support the Centre and make use of its expertise and facilities.

During that time, the chairperson visited the member States and appealed to them to support the Centre and make use of its expertise and facilities. Following the Chairperson's efforts to sensitize member States on the importance of the Centre, coupled with the important role

the Africover project. The increase in demand for internet services, as a result of the increase in the number of computers was met by an upgrading of Internet bandwidth from 256 kbps to 1024kbps and installation of a new CISCO router with firewall capability, which ensures security and continued internet service delivery. New IT policies were put in place to govern IT use at RCMRD, to ensure that ICT users conform to laid-down procedures and to minimize abuse of resources. Acquisition and installation of a network printer centralised printing as well as brought down the costs of purchase of replacement cartridges.

- In June, 2006, 25 new network points were installed in a renovated GIS block, which enables the GIS staff to communicate and share data more easily.

- ITS also started to look into ways of using GRASS GIS software and quantum GIS software. Both are GIS open source software's and are very popular in other parts of the world.

- Other new equipment purchases included six high-end dell computers and UPS's, photocopy machines, a new printer, a wide format scanner, a television set was for showing academic cinemas.

Physical Infrastructure

In an effort to improve the physical infrastructure, the following activities were undertaken:

- The old GIS room in Block C was refurbished and redesigned to accommodate a data dissemination laboratory, printing and scanning laboratory, a reference room and a display room. Networking and power cabling systems were setup in these laboratories
- Floor tiling and repainting of offices were carried out in Blocks A and D
- Fans were installed in the ITTC lecture rooms and offices.
- Air conditioners were installed in the Server room, DGS office, and Engineering and DDS Data room was undertaken in May 2006.
- Construction of a fireproof database storage room
- Construction of car shades

Staff Training

A number of the staff members were sponsored by the Centre for professional training within

and at other institutions:

- All staff underwent a 4 days group training on performance management and leadership in January, 2006
- Three engineers were trained in servicing of analogue A 8 and B 8 photogrammetry equipment at the Survey of Kenya for three weeks.
- One Engineer attended a week's refresher course in servicing of Total Station - the software aspect of TPS 1000 and TPS 300 – 700 series at Leica factory, Switzerland.
- Short term training was given to RS/GIS staff members on Advanced Remote Sensing, ESRI-ARCGIS, Photogrammetry and GPS data reduction.
- Several other staff continued with their self-sponsored academic and professional training at different universities and colleges.
- One ITS staff was trained in GeoNetwork in March, 2006.

Financial Management Highlights

During the reporting period, the management of the Centre continued ensuring prudent management of financial resources. Efforts were geared towards controlling costs and improving revenue generation. Most member states continued supporting the Centre through remittance of annual contributions and arrears. Total revenue for the period was US\$ 1,870,806.00 as compared to US\$ 1,725,256.00 in year 2005.

The operating expenses stood at US\$ 1,423,751.00 as compared to US\$ 1,465,956.00



Centre Staff during training on performance management

DISTINGUISHED VISITORS TO THE CENTRE

In 2006, the Centre received a large number of distinguished guests from its member states, development partners and clients and among them were:

- **Honourable Tibamanya**, M.P., Minister of State for Urban development, Uganda
- **Honourable Henry D. Phoya**, M.P., Minister of Lands, Housing and Surveys, Republic of Malawi
- **Honourable Henry Isak Katali**, M.P., Deputy Minister, Lands and Resettlement, Namibia
- **Honourable Ms. Theresa S. Ivo**, State Minister, Urban Development, Sudan
- **Ms. Botshelo Mathuba**, Chairperson of Governing Council and Permanent Secretary, Ministry of Lands and Housing, Botswana.

- **H.E Matti Kaarianen**, Ambassador of Finland
- **Dr. C. J. Thompson**, Director of EROS Data Centre, USGS, USA:
- **Dr Sospeter Muhongo**, Director, ICSU Regional office for Africa, Johannesburg, South Africa



Hon. Tibamanya, M.P. Minister of State for urban development, Uganda Minister of Lands, plant's a tree at the Centre



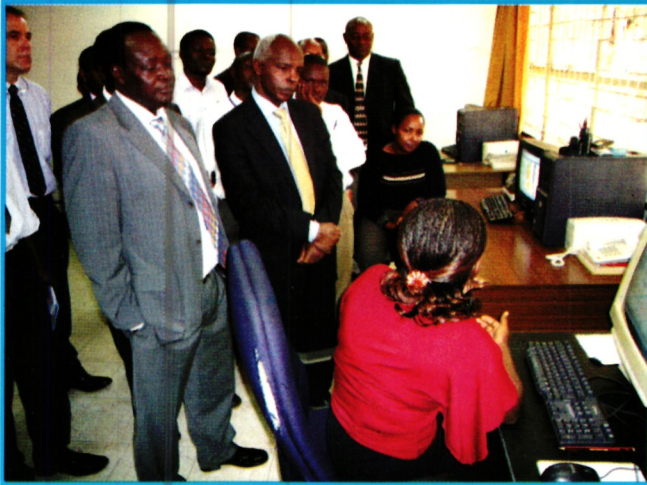
Hon. Henry Phoya, Malawi Minister of Lands, Incoming Chairperson of the Conference of the Ministers during his familiarization tour of the Centre

The year 2006 marked the end of the successful implementation of the Centre's 2003 – 2006 Business Plan which led to the transformation of the Centre from an insolvent and moribund institution to one of the leading institutions in Africa that is at the forefront of promoting the use of geo-information in sustainable development in its member states and Africa in general. The transformation of the Centre was possible due to the commitment of its management, staff and member States.

The Centre now has highly qualified staff, the state of art ICT infrastructure and excellent physical infrastructure. It is recognized world-wide as one of the leading institutions in Africa that promotes the use of geo-information in sustainable development. It collaborates with various international organizations, institutions and companies through signing of MOUs in the implementation of various activities for example training, research and projects. Among the organizations are NASA, European Space Agency, SPOT, ITC, various universities etc. It is an active member of various professional bodies including International Association of Remote Sensing and Photogrammetry and International Cartographic Association (ICA). It is also involved in the coordination and implementation of various continental initiatives for example Mapping Africa for Africa (MAFA) and Africa Geodetic Reference Frame (AFREF).

The challenge the Centre now faces is to maintain its current growth and achieve its vision of becoming the Centre of excellence in geo-information in Africa. The implementation of the Strategic Plan (2007 – 2010) is aimed to ensure that the Centre maintains the tempo of the achievements that have been realized as the result of restructuring and to propel it to a heightened growth regime. This has further been enhanced by the development and implementation of a new organizational structure. Apart from the above, for the Centre to maintain its current growth it requires visionary and strong leadership, commitment of the staff, support of both member States and development partners.

Lastly I take this opportunity to thank all who have been involved in the transformation of the Centre- particularly the management, staff, member States, development partners and clients. I urge them to continue supporting the Centre to grow to greater heights.



Acting Minister of Lands, Prof. Kibutha Kibwana at the Centre



Hon. Henry Katali, Deputy Minister for Land, Namibia at the Centre



Hon. Teresa Ivo, Sudan Minister of Lands, at the Centre



Eng. Manboub Maalim, Permanent Secretary, Ministry of Water and Irrigation (Kenya) visits the Centre



UN Habitat Executive Director Madam Anna Tibaijuka host the DG and Malawi Minister of Lands.



Hon. Tibamanya, Uganda Minister of Urban Development and Staff of the Centre



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Annual Report 2010





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Annual Report 2010



DR. HUSSEIN O. FARAH
DIRECTOR GENERAL

It is with great pleasure that I present the RCMRD 2010 annual report. I am pleased to report that, working closely with our Member States and partners we have made significant progress in 2010. The year 2010 was the last year of the implementation of our 2007-2010 Strategic Plan. The plan focused on the building of capacity of Member States institutions to generate information for planning and decision support to tackle environmental and resources issues and accelerate the social and economic development of our countries. This annual report highlights the activities undertaken in 2010 in particular implementation of projects, customer tailored applications of geoinformation training and IT courses, research and development, and infrastructure and staff development at RCMRD.

There has been greater interest in the services of RCMRD from Member States and partners resulting from our vigorous efforts in engaging with Member States to improve our visibility and enable more national institutions know and use

the services available at RCMRD. As RCMRD strives to enhance its presence in Member States, it is focused on delivery of quality service to meet and exceed expectations of stakeholders. At the same time RCMRD is also geared to addressing stakeholders needs for innovative and efficient solutions for their sustainable development. This would be achieved by establishing quality standards. To this end in 2010, RCMRD embarked on the process of acquiring ISO 9001: 2008 Quality Management certification. The certification will enable RCMRD to consistently build customer confidence and satisfaction and assure quality of services and products. In 2010 quality management and documentation training was carried out and quality management structure was instituted. Documentation of key processes and procedures was also undertaken. The process is expected to be completed in 2011.

Sixteen projects were carried during the reporting period. We report on some interesting and innovative projects such as Health Service Mapping and Policing, Mapping of High Tension Power Lines using LIDAR technology, Resource and Pastoralist Mobility Mapping for Drought Risk Reduction, creation of National Digital Topographic and Cadastral Database and Africa Monitoring of Environment for Sustainable Development.

In 2010, we continued to focus on capacity building and provision of advisory services to Member States. Our training programmes continued to attract many participants as the demand for geoinformation training continues to

REMOTE SENSING, GIS AND MAPPING DEPARTMENT

The Department of RS, GIS and Mapping implemented various activities during the year 2010 in accordance with the work programme that was approved by the Governing Council. Among the services provided the following are the major ones.

Projects implemented:

SERVIR-Africa Project

SERVIR-Africa project is a five years project jointly implemented with NASA and funded by USAID. The project started in November 23rd 2008. During the Reporting year, the following activities were implemented:

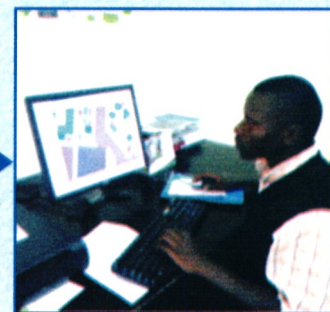
- Establishing SERVIR-Africa Data-portal and populating it with spatial data and associated metadata records,
- Finalization and operationalization of the flood forecasting tool (CREST-Model),
- Inventory and mapping of biodiversity hotspots and assessment of vulnerability to climate change in Kenya,
- Development and implementation of Rapid Land Cover Mapping (RLCM) tool,
- Development of a comprehensive SERVIR Web-portal that contains data, products and information, models, reports, activities, etc. that are being developed and processed by SERVIR Nodes.
- Development of Tropical Coral Reef assessment and monitoring tool

Development of Digital Topographic and Cadastral Database Project

The project was awarded to the Centre through a competitive bidding by Survey of Kenya. Its main objective was to convert analogue topographic and cadastral maps to digital, and availing them through a computerized system information management system. Accordingly, the Centre scanned and digitized 100 standard topographic sheets (1:50,000) and digitized all information contained therein into separate layers based on Kenya National Spatial Data Infrastructure (KNSDI) standards. The Department also scanned 60,000 cadastral maps and catalogued them using in-house developed data capturing, archiving and retrieving software. The project activities were successfully completed in eight months, and the deliverables were handed over to Survey of Kenya during the reporting year.



Hard Copies Working Environment



Digital Working Environment

South Sudan Water Information Clearing House (SSWICH) Project

The South Sudan Water Information Clearing House (SSWICH) project was awarded to the Department by United Nations Economic Commission for Africa (UNECA) in 2009. Phase I was implemented in year 2009 and Phase II which is a major component of the project was implemented during the reporting year. During this



Course Participants from RCMRD Member States

Two professional from each Member State (one from mapping sector and one from disaster management sector) participated in the capacity building training. A three day awareness creation workshop was also conducted in Addis Ababa, Ethiopia for decision makers in disaster management areas from RCMRD member states.

Rehad River and Barrage Pond Mapping Project

This is a mapping project awarded to the Department by the Ministry of Water Resources of Sudan through YAM-CDC Engineering Company. The main purpose of the project was mapping of land use and land cover situation of the Rehad River Basin in order to rehabilitate the irrigation scheme in the area that was affected by Rehad River changing its course. The Department implemented the project in collaboration with YAM-CDC engineering company in Khartoum, and mapping component of the project was successfully completed, and training was also offered to professional staffs from the Ministry of Water of Sudan.

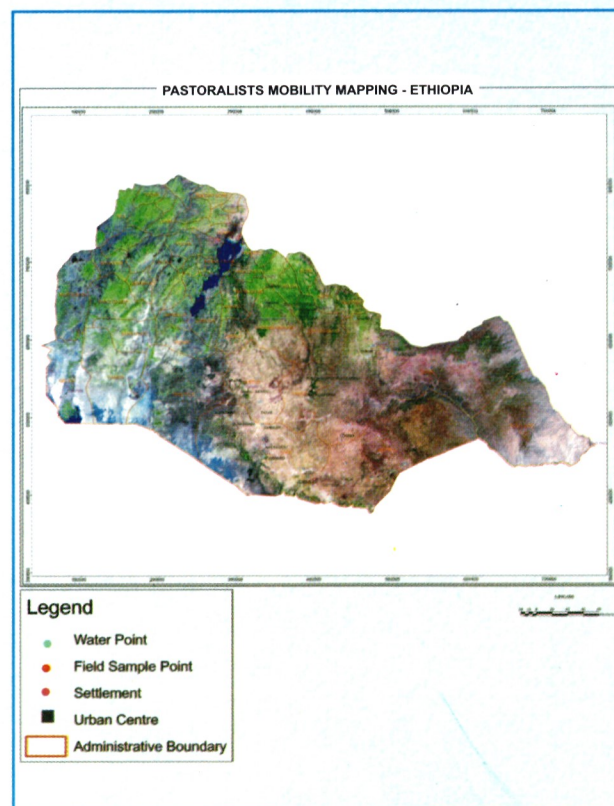
Mapping of ARV (Antiretroviral drugs) Distribution Centers Project

This was a service mapping project that was sub-contracted to the Department by Pharma Kenya. The project was dealing with mapping of Antiretroviral (ARV) drugs distribution Centers in Kenya. The work was successfully completed and handed over to the client.

Pastoral Community Movement Mapping Project

This project was awarded to the Centre by an NGO called CORDAID and the overall objective of the project was to generate information (including GIS) on resources available to pastoralists, current management practices and their mobility patterns for guiding the development of the Drought Risk Reduction Program.

Recognizing the importance of sound and sustainable management of the highly fragile natural resources in the arid and semi-arid area and to enhance drought risk reduction CORDAID wanted to build on existing pastoralists' knowledge and practices used in managing risks and organize and plan the use of scattered scarce natural resources efficiently in space and time. To help it generate necessary information, CORDAID contracted RCMRD to undertake a study on Resource and Pastoralist Mobility Mapping covering six regions in the arid and semi-arid area of Northern Kenya and Southern Ethiopia.



project is the International Institute for Geoinformation Science (ITC) in the Netherlands.

GMFS-III Project

Global Monitoring for Food Security III is also ESA funded project aiming at improving crop acreage mapping and crop yield estimation in the region. The Centre has been supporting the consortium members (SARMAP, EFTAS and VITO) from Europe in ground truthing, field data collection, professional training and data processing. This project will focus on the priority countries identified by ESA which are Sudan, Ethiopia, Kenya and Malawi for next three years.

Rapid Land Cover Mapping (RLCM) Project

The Centre was supporting Famine Early Warning Network (FEWSNet) of the USAID in interpretation of satellite images over cropped areas in Kenya and Tajikistan. FEWSNet uses the interpreted satellite data for crop acreage mapping that feeds into crop yield estimation exercise. The Centre was using the RLCM (Rapid Land Cover Mapping) technique in rapidly interpreting the satellite images supplied by FEWSNet

Training and Workshop Programmes

Training was a major activity undertaken in 2010 with more than 500 people from member states and other countries trained. Most of the courses were held at the Centre and others held in Ethiopia, Lesotho, Malawi, Namibia, Zambia and Uganda. Some of the training courses and workshops held were as follows:

- Photogrammetry training for Ethiopian Mapping Agency
- GIS training in Uganda
- Photogrammetry training in Zambia
- Regional Workshop on Trypanomiasis Mapping for IGAD Region
- Regional training on Disaster Rapid Mapping and Early Warning for member States
- GIS training for Centre for Disease Control/Kenya Medical Research Institute (CDC/KEMRI) in Kisumu Kenya
- Regional training on flood Modeling in collaboration with USGS for member States
- EO application in water resource management with TIGER II project for African States
- GIS training for Physical Planning Department, Lesotho
- GIS Training for KENGEN-Kenya
- GIS and RS Training for Kenya Bureau of Statistics
- Post-graduate course on Earth Observation application in Integrated Water Resources Management



GIS Training Participants in Lesotho

Preparation of concept note and review of proposals for the, Government of Tanzania:

The department produced and presented a concept paper on Geopolicing to the Tanzanian Police. It also reviewed a proposal on Land Information Management System for Department of Surveys and Mapping, Tanzania.

Preparation of concept paper on Setting up of operational Digital Photogrammetry Laboratory for the Government of Uganda

A concept paper on the how to set up a digital photogrammetry laboratory was prepared and presented to the Surveys and Mapping Department of Uganda

Supporting the Government of Kenyan in negotiating with Italian Government on the use of Malindi Space Station:

The department is supporting the Kenyan Space Secretariat and Council of Science and Technology in preparation of a strategy document for managing and using the Malindi Space Station jointly with the Italian Government.

Research and Development:

There were two research projects namely: the CREST Model development for flood forecasting and International Atomic Energy Agency (IAEA) project on Tsetse fly genetic isolation mapping conducted during the reporting year. The two research activities are still being undertaken, and intermediate results were published in peer reviewed scientific journals.

Data archiving and dissemination:

During the reporting year, the Department implemented data retrieval, dissemination,

archiving and sales activities as summarized below:

- Scanning of 100 topographic maps and 60,000 cadastral plans was successfully carried out,
- Scanning of 152 map sheets for different clients were done, over 66 of A0 print size and 747 of A4/A3 maps size were printed,

Data retrieved and disseminated to member States include :

a) Uganda Commissioner of Lands:

- i. SPOT imagery scenes covering the Lake Victoria Boundary area between Uganda and Kenya
- ii. Landsat images for the Lake Victoria region
- iii. ASTER image scenes covering the same area

b) Zambia:

Over 40 Landsat satellite images delivered to the Ministry of Lands

c) Ethiopia:

171 ASTER image scenes covering Central Ethiopian Plateau from 2001 to 2010 delivered to Ethiopia Mapping Agency (EMA), MODIS Terra data covering the whole country was also handed over to EMA

d) Swaziland: Eleven (11) Landsat Scenes for a four time serious was delivered to University researchers in Swaziland.

Data sales and dissemination accomplished during the reporting year:

- a. Over 1,349 Km² of very high resolution satellite imageries from QuickBird, WorldView-1, IKONOS and GeoEye satellites covering different parts of Africa's cities, conservation areas and road

The project involves the use of modern mapping technologies and equipment including digital aerial photographs, Lidar images, GPS, Total Stations etc. The project will produce digital topographic maps, databases and cadastral information along the transmission line. Other products will include mosaics of ortho-photographs and GPS control data for rectification of the aerial-photographs and Lidar images.

Rural Electrification Authority (REA) Project

RCMRD was awarded work to undertake several route surveys of several rural electrification line by Rural Electrification Authority (REA) of Kenya. The survey work is to be undertaken for the purpose of provision of data that will be used in designing of high and low voltage networks in rural areas. The survey work included:

- Physical survey of the proposed routes to obtain profiles and pick-lines details to ensure that lines do not pass through swamps, over buildings or any other obstacle.
- Pegging on site as per approved designs.
- Production of hard and softcopy drawings at scale of 1:2,500.

Saiwa Swamp National Park Project

GeoSurv System Company and the Department were awarded a tender by Kenya Wildlife Service (KWS) to provide cadastral survey services for Saiwa Swamp National Park. The work comprises of:

- Boundary cadastral survey works including monumentation of all boundary points
- Provision of sufficient and permanent control points on the ground

- Production of detailed cadastral maps of the protected areas at appropriate scale

It is expected that the maps to be produced when approved will provide legal security and thus improve land management of the wildlife protected areas.

Training

The Department organized the following courses:

Global Navigation Satellite Systems Training at Ethiopia Mapping Agency (EMA)

A course on the use GNSS receivers and processing of GNSS data using LEICA Geo Office software was held from 16th May to 26th May for 14 Land Surveyors from the Directorate of Surveys in Ethiopia.

The training included field data acquisition, downloading and editing, baseline and coordinate computations and datum transformation. The Land Surveyors were also trained on how to integrate data acquired from different receivers and conversion of vendor data formats to Receiver Independent Exchange (RINEX).

Training on AFREF and Processing of Global Navigation Satellite System (GNSS) Data

Training on African Geodetic Reference Frame (AFREF) and Processing of Global Navigation Satellite System (GNSS) data was conducted on 23rd August - 4th September. Sixteen participants from African countries including Botswana (9), Ethiopia (1), Kenya (3), Lesotho (1), Namibia (1), and Nigeria (1) attended the course. The resources persons were drawn from SEGAL in Portugal, Jomo Kenyatta

- Budgeting for LMIS pilot project that will cover Lilongwe city and Mchinji
- Budgeting for LMIS that will cover the whole country.

Feasibility Study for Establishment of GPS Continuous Tracking Reference Stations in Botswana

The Department of Surveys and Mapping of Botswana requested RCMRD to undertake a feasibility study to establish Global Positioning Systems (GPS) Continuous Tracking Reference Stations (CORS). RCMRD prepared and submitted a proposal for undertaking the above-mentioned feasibility study to the Department of Surveys and Mapping of Botswana

Engineering Section

The Section continued to render services in servicing, repair and calibration of surveying instruments to government and private practitioners within the member states. One technician was trained in China to repair South Surveying instruments. This has increased the capacity of the section to repair Chinese made instruments which are now becoming widely used in most of our member States. During the reporting period the Section rendered services to three member countries, namely Kenya, Malawi, Tanzania and Zambia

Following is a list of instruments serviced, cost of service and the replacement cost:

Country	Number of instruments	Service cost (US \$)	Replacement value (US \$)
Malawi	GPS 1200- 6 Units	1,750.00	126,000.00
Zambia	GPS 1200- 6 Units	1,750.00	126,000.00
	TPS 1200- 1 Units		23,000.00
Tanzania	Total station - 12 Unit	6,000.00	144,000
	Optical Theodolite- 17	7,600.00	1,360,000
Kenya	Total Station- 62 units	31,000.00	744,000.00
	Optical Theodolite 55 units	24,750.00	440,000.00

IT Training Centre (ITTC)

During the year, ITTC continued to offer both academic and professional training as part of its core business. These include the Jomo Kenyatta University of Agriculture and Technology (JKUAT) Diploma and Certificate in Information Technology, the JKUAT Certificate in Bridging Mathematics and professional training from basic to advanced computing.

The student population for the academic programs stabilized while the End-User training registered remarkable improvement during the year. Training was offered to a number of corporate clients on demand basis.

Facilities Improvement

In an effort to keep abreast with the emerging technological trends as well as facility upgrading, 20 high end computers were purchased for the computer laboratories.

Academic Achievements

On 29th July 2010 60 Diploma in IT students graduated in a colourful ceremony held at the JKUAT main campus, in Juja Kenya.



ITTC Diploma Students Graduation

innovative and efficient solutions for their sustainable development. This would be achieved by establishing quality standards. The 2007-2010 Strategic Plan envisaged to acquire ISO Quality Management Certification. To this end in 2010 the Centre embarked on the process of acquiring ISO 9001: 2008 Quality Management certification. Quality management and documentation training was carried out and the Quality Management structure was instituted. Documenting of key processes and procedures was also undertaken.

Strategic Partnerships

Over the years the Centre has continued to establish beneficial partnerships and collaboration with relevant institutions in research, development and application of geo-information for sustainable development. In this regard the Management engaged member States and development partners in pursuit of areas of collaboration. These included:

Visits to Member States

The Management made visits and held discussions with a number of institutions in Ethiopia, Lesotho, Malawi, South Africa, Swaziland and Uganda. The visits were aimed at exposing member States institutions to the Centre's services and identifying areas of collaboration. This resulted in the Centre facilitating projects, workshops and training programmes in the following member States: Ethiopia, Lesotho, Malawi, Namibia, Uganda and Zambia.



Meeting with the Her Royal Highness Princess Tsandzile, Minister of Natural Resources & Energy, Swaziland

Visit to the Centre by NASA Administrator

The Administrator of the National Aeronautic and Space Agency (NASA), Mr. Charles Bolden, Jr. visited the Centre on 22nd July, 2010. He held discussions with Management with a view to identify areas of cooperation. A Joint Statement of Intent for Cooperation in Remote Sensing Research and other areas of mutual interest was signed between the two institutions. The NASA Administrator was received by the Chairperson of RCMRD's Governing Council, Mr. Gabindadde – Musoke, Permanent Secretary, Ministry of Lands, Housing and Urban Development, Uganda on behalf of member States.



NASA Administrator during his visit to the Centre signing Joint Statement of Intent with RCMRD Director General

Visit by UNECA Director of ICT, Science and Technology

The UNECA Director of ICT, Science and Technology, Ms. Aida Opoku-Mensah visited the Centre on 28th August, 2010. The purpose of the visit was to strengthen the relationship between ECA and RCMRD.

Establishment of UN-SPIDER Regional Support Office at RCMRD

Following an Agreement signed between United Nations Office for Outer Space Affairs (UNOOSA) and RCMRD, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-

reviewed the Agreement establishing the Centre and the draft Strategic Plan 2011-2014. The GC also approved the Centre's 2011 Work Plan and Budget



Governing Council Members

Administration

Management continued facilitating implementation of planned activities through the provision of the following support services:

Physical Infrastructure

The following activities were undertaken in order to improve the facilities and infrastructure of the Centre:

- Carrying out facelift of the main blocks (buildings) by painting and repairing fixtures.
- Maintaining buildings and compound.
- Service and maintenance of the Power Generator.
- Servicing electric fence.
- Carrying out maintenance work such as carpentry and plumbing.
- Procurement of 20 computers for training.

Transport and Protocol Services

The main transport and protocol services that were provided were as follows:

- Procurement of one saloon vehicle and one land

cruiser to replace unserviceable vehicles.

- Disposal of two old vehicles.
- Servicing of motor vehicles.
- Renewal of vehicle insurances.
- Clearance of imported equipment with customs.
- Processing of Re-entry and work permits for international staff and their families.
- Processing of VAT and Duty Exemptions by the Kenya Revenue Authority in liaison with the Ministry of Foreign Affairs, Kenya.
- Provision of transport for staff, dignitaries who visited the Centre during the year and Course participants.

Information Technology Infrastructure

The following activities were undertaken to provide support for the Centre's objectives:

- Maintenance the Centre's ICT infrastructure and facilities.
- Enhancement of the Centre's website by adding download section and advanced data management.
- Procurement and implementation of a new e-mail management system.
- Monitoring e-mail, Internet and IT usage.
- Upgrading Internet to 3MB up and down.
- Installing a new e-mail server system.
- Maintenance of telephone infrastructure.

Library Services

The following activities were undertaken in the Library:

- Processing of 2670 information materials, including stamping, fixing cards, classification and cataloguing.
- Continued acquisition of various information materials which included 181 Geo-information

a new Performance Management System commenced. To date draft appraisal forms and a draft Performance Management Handbook – containing guidelines of how to plan, monitor and review performance have been produced. Since the approach is also intended to link individual level performance evaluation with strategic plan implementation, at present the Strategic Plan Results are being harmonized with individual results in the Performance Management System. After completion and approval of the tools, training for all staff will be arranged.

Staff Training

During the year a number of staff attended different training programmes. The Chief Technician Engineering section participated in one week training at Leica in Switzerland on maintenance of GPS 1200 in April, 2010. He also attended a one week training from 19th to 24th April, 2010 in China on maintenance of Chinese made Total Station at South Surveying Instruments. A Remote Sensing Technician attended a 3 day training course on GIS Technology for Disaster and Emergency Management at Africa eDevelopment Resource Centre, Nairobi, Kenya in July, 2010. The Finance Officer attended the Institute of Certified Public Accountants of Kenya (ICPAK) Managerial Accounting Training seminar in Mombasa, from 21st to 23rd July, 2010.

A number of staff continued with self sponsored training in local colleges and universities on part time basis to acquire more knowledge and/or improve their professional skills. Two Engineering Technicians are pursuing Bachelor's degree in Business Management; One GIS Technician is pursuing Bachelor's degree in Information Systems Management; an IT Technician is pursuing Bachelor's degree in Information Technology and a Librarian joined a Bachelor of Library Information Sciences programme. The Business Development and Marketing Officer is continuing with a Masters degree in GIS & Management programme through correspondence.

Attendance of Workshops, Conferences and Seminars

Officers from the Centre attended workshops, conferences and seminars as follows:

- Conference on Implementing the Strategy on Improving Agricultural Statistics in Africa, Tunis, Tunisia, February, 2010.
- DevCoCast 2nd regional land training workshop in Africa in conjunction with AMESD/IGAD, Nairobi, Kenya, February, 2010.
- First GeoAfrica Satellite Core Team Meeting, Geneva, Switzerland, February, 2010.
- South Sudan Water Information Clearing House (SSWICH) project validation workshop held in Juba, South Sudan from 25th to 27th March, 2010.
- AFREF Experts Meeting, Ile-Ife, Nigeria, February, 2010.
- Geo-information application in National Development Workshop held in Lilongwe, Malawi from 14th to 16th April, 2010.
- AMESD Technical Experts Meeting (TEM7) Addis Ababa, Ethiopia, May, 2010.
- AEGOS Project Mid-Term Conference, Dar-es-Salaam, Tanzania, May, 2010.
- Joint Steering Committee (JSC) Meeting of the



Minister of State for Information & Communication Technology of Ethiopia visiting RCMRD Booth during AARSE Conference held in Addis Ababa.

Mapping Authority, March.

- Patrick Rutabanzibwa, Permanent Secretary, Ministry of Lands, Housing and Human Settlements, Tanzania, April.

- Dr. Jorg Szarzushi, UN SPIDER, April.

- Leparan Christopher, Chief HRO – GDC, April.

- Gray Tappan, USGS EROS CENTRE, USA, May.

- Oliver Leo, Joint Research Centre, Ispra, Italy, May.

- Blake Zachary, ICF Macro, Measure Project, USA, May.

- Prof. Isi Ikhuoria, RECTAS, Ile-Ife, Nigeria, May.

- Jo Lambert, INFOTERRA, UK, May.

- Dr. Nick Veck, Director, Space Business, May.

- Kristina Bwik-Landmateriet, Sweden, May.

- Jeff Bryant, UK Hydrographic Office, Taunton, UK, May.

- Commander Bob Wilson, UK Hydrographic Office, Taunton, UK, May.

- Dr. Dmitry Travin, UNESCO, Paris, France, May.

- Ing. En Chef Tichel Huet, International Hydrographic Bureau, Monaco, May.



Mr. Charles Bolden Jr. NASA Administrator
Planting a tree during his visit to RCMRD



Chairman of Conference of Ministers
Hon. Daniel Atubo during visit to Sudan

- Dehue Josefien, VITO, Belgium, May.

- Darurdt Flore, University of Ghent, Lab for Forestry Management and Spatial Information Technique, May.

- Aster Gabremasriam, Dev Team Leader, SSWICH project UNECA Ethiopia, June.

- Peter Paul Lucy Gatluak, Coordinator, SSWICH, Ethiopia, June.

- Elizabeth Lyons, International Science and Engineering, USA, July.

- Raffaece Mattioli, FAO Headquarters, Rome, Italy, July.

- H.E (Eng) Mahboub Maalim, Executive Secretary, IGAD, Djibouti, July.

- Jason L. Kessler, National Aeronautic and Space Administration (NASA), July.

- Charles F. Bolden, Jr., Administrator, National Aeronautic and Space Agency (NASA), July.

- Lotthammer Charey, INPHOS, Maragdeg, Germany, August.

- Adam Abbaker Bashier, Under Secretary, Ministry of Irrigation and Water Resources, Sudan, August.

- Aida Opoku-Mensah, Director, ISTD, UNECA, Ethiopia, August.

- Francesco Palazzo, ESA-ESRIN, Frascati, Italy, August.

- Kaj Holmberg, Media Consultant, GEOSS Film, Germany, September.

Pictorial



Remote Sensing training participants at RCMRD



Technician servicing mapping equipment



Trainees from Rwanda Land Management Information meeting with the Director general, RCMRD at the Centre