Regional Centre for Mapping of Resources for Development

RCMRD

RCMRD In 2023

Mapping for Sustainable Development

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LIST OF ACRONYMS AND ABBREVIATIONS

AGCOM	Agricultural Commercialization Project
AGRA	Alliance for a Green Revolution in Africa
AU	African Union
BIOPAMA	Biodiversity and Protected Areas Management
BMGF	Bill and Melinda Gates Foundation
CIFOR	Center for International Forestry Research
CTCN	Climate Technology Centre and Network
EU	European Union
FAO	Food Agriculture Organization
GMES	Global Monitoring for Environment and Security
GNSS	Global Navigation Satellite System
GIS	Geographic Information System
ICRAF	World Agroforestry Centre
ISUD	Integrated Strategic Urban Development Plan
IT	Information Technology
ITS	Information Technology Services
IUCN	International Union for Conservation of Nature
JRC	Joint Research Centre of the European Commission
KWCA	Kenya Wildlife Conservancies Association
LDN	Land Degradation Neutrality
M & E	Monitoring and Evaluation
MOU	Memorandum of Understanding
NELGA	Network of Excellence on Land Governance in Africa
RCMRD	Regional Centre for Mapping of Resources for Development
RCTI	Regional Centre Training Institute
RRH	Regional Resource Hub
RRIS	Regional Reference Information System
SIS	Soil Information System
SOPACA	State of Protected and Conserved Areas Report
UNECA	United Nations Economic Commission for Africa

OUR MEMBER STATES

The Regional Centre for Mapping of Resources for Development (RCMRD) was established in 1975 under the auspices of the United Nations Economic Commission for Africa (UNECA) and the African Union (AU). It is an inter-governmental organisation and currently has 20 contracting Member States in the Eastern and Southern Africa region namely: Botswana, Burundi, Comoros, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Somalia, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia and Zimbabwe. See Figure 1 below.
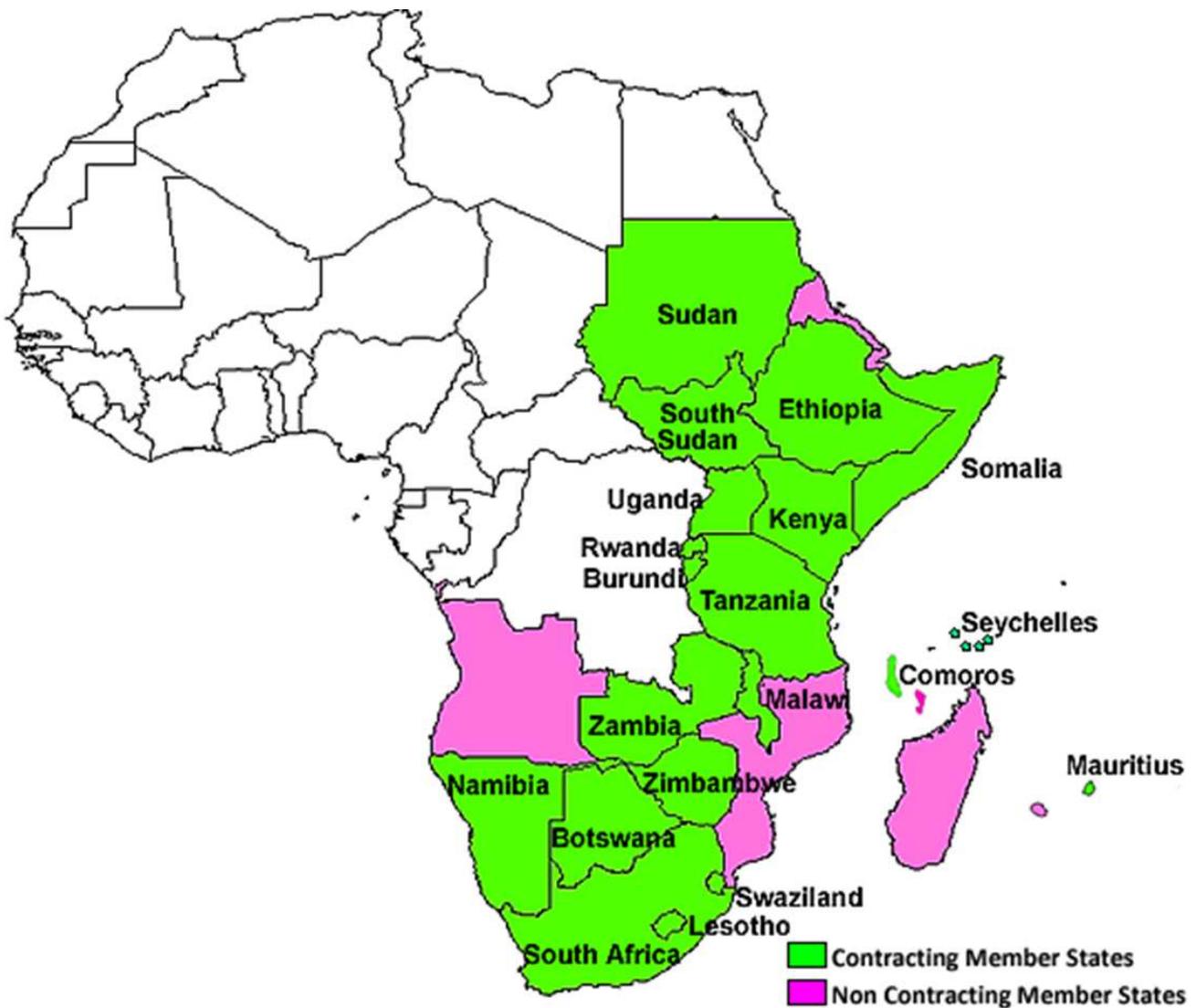

Fig 1. Map of RCMRD Member States

OUR VISION, MISSION AND APPROACH

OUR VISION

To be a Premier Centre of Excellence in the provision of geo-information and allied technologies for sustainable development in the member States and other stakeholders.

OUR MISSION

To strengthen the member States and our stakeholders' capacity through generation, application and dissemination of geo-information and allied technologies for sustainable development.

OUR APPROACH

RCMRD programmes are oriented towards sustainable applications in natural resource management, infrastructure and environmental management utilizing Geo-Information Technologies

Our Core Values

Team Work

Driven by team spirit and a sense of belonging through the pursuit of collaborations and synergy.

Customer Focus

Committed to the effective and efficient delivery of quality and appropriate services/products to all our stakeholders.

Stakeholder Engagement

Proactively and continuously engage our stakeholders and users for relevance and value proposition.

Innovation and Creativity

Continuously improve our operations and add value to our stakeholders by embracing and pursuing innovative and creative solutions.

Accountability & Transparency

Uphold professionalism, integrity, honesty, and ethical practices in all our programs and operations.

Equity & Inclusiveness

Embracing value for people by treating our staff and our stakeholders with respect and dignity while appreciating their diversity.

THE CHAIPERSON'S NOTE

It is an honour for me to present the RCMRD Annual Report for 2023 as the chairperson of the RCMRD Governing Council. This report is the result of our combined resilience, hard work, and commitment to advancing geospatial excellence in the RCMRD member States and globally. Over the year 2023, we have remained steadfast in our commitment to leveraging technology for sustainable development, as evidenced by the impactful projects and collaborations detailed within these pages. From capacity-building to project implementation, we have clearly demonstrated our unrelenting dedication to our mandate. As we navigate the challenges and opportunities that lie ahead, let this report serve as a testament to our collective achievements and a roadmap for our continued progress.

I extend my sincere gratitude to our partners, dedicated staff, and supportive stakeholders for their commitment to propel RCMRD towards greater heights. Together, let us forge ahead, empowered by our shared vision of a resilient and prosperous Africa.

Mrs. Dorcas Wagima Okalany
Permanent Secretary Ministry of Lands, Housing and Urban Development-Uganda
Chairperson RCMRD Governing Council, 2022-2024

FROM DIRECTOR GENERAL'S DESK

I am delighted to present to you the RCMRD 2023 Annual Report, marking the inaugural year of our journey under the current Strategic Plan (2023-2026). As we reflect on the accomplishments detailed within this document, let us acknowledge that each milestone is a testament to our collective dedication and commitment towards the vision set forth by the RCMRD Conference of Ministers (CoM) meeting in Kampala, Uganda in the year 2022.

Through strategic foresight and collaborative efforts, we have embarked upon a path of innovation, resilience, and sustainable development. This document encapsulates our tireless pursuit of excellence in utilizing geospatial technologies to address the evolving challenges faced by our region.

From capacity-building initiatives to impactful research projects, every endeavour documented herein underscores our unwavering determination to realise the aspirations outlined in our strategic plan and the founding mandate of our institution.

Our being and everything we are able to accomplish is driven by our primary stakeholder, the member States and to them we are most grateful and will always be committed.

Dr Emmanuel Nkurunziza
Director General-RCMRD

ADDRESSING GLOBAL CHALLENGES

At RCMRD, our mission is deeply rooted in fostering sustainable development through the utilization of geospatial technologies. We are committed to addressing critical environmental challenges by focusing on key thematic areas;

Agriculture and food security

Weather, climate change and impacts

Ecosystems Management and Natural Resource Monitoring

Land Cover Land Use Mapping and governance

Water Resources and Hydro-Climatic Disasters Services

Disaster Risk Reduction and Management

Source-WHO/Billy Miaron

AGRICULTURE & FOOD SECURITY

Maize farming in Nyandarua County, Kenya

a. Gender Sensitive Agricultural Index-Based Insurance (GAIINS)

The Gender Sensitive Agricultural-Based Index Insurance (GAIINS) initiative, which was spearheaded by RCMRD under the thematic area of Agriculture and Food Security, aimed to empower women farmers in the country to withstand climate shocks. By promoting the uptake of index-based insurance, the project sought to enhance resilience among female farmers, build gender sensitive products for women farmers while fostering gender transformative approaches within the insurance sector.

Targeting Kenyan counties such as Bungoma, Embu, Makueni, Nakuru, and Uasin Gishu, GAIINS conducted pilot data collection to gather insights into gender-disaggregated cropping priorities, crop insurance needs, and climate change resilience strategies among farmers. Through such an initiative, RCMRD strives to enhance food security and agricultural sustainability while promoting gender equality and women's empowerment in the agricultural sector.

b. Regional Food Balance Sheets (RFBS) for Eastern and Southern Africa

In today's rapidly evolving landscape, access to accurate and timely data is crucial for informed decision-making across various sectors, particularly in agriculture and food security. Recognizing this, the Common Market for Eastern and Southern Africa (COMESA) and the Alliance for a Green Revolution in Africa (AGRA), in collaboration with the Foreign, Commonwealth, and Development Office (FCDO), USAID, the Bill and Melinda Gates Foundation (BMGF), and the Rockefeller Foundation (RF), established the Regional Food Balance Sheet (RFBS).

This initiative, implemented by RCMRD, aims to provide stakeholders in the agricultural domain with comprehensive and reliable data to enhance planning and resource allocation. Recent training conducted on the RFBS dashboard and GIS data processing in Zambia marked the successful closure of Phase I of

Source-FAO

the project, with all deliverables and reports promptly submitted to AGRA. This milestone underscores the commitment we have to the Agriculture and Food Security thematic area, as it continues to play a crucial role in leveraging geospatial technologies to support food security and sustainable agricultural practices across Eastern and Southern Africa.

c. Soil Erosion Evaluation using Advanced Laboratory Measurement Methods

RCMRD is implementing a project focused on soil erosion evaluation using advanced laboratory measurement methods to support climate-resilient agriculture and food security. Launched in 2022 and executed in collaboration with the Sudanese Natural Resources General Directorate of the Ministry of Agriculture and Natural Resources (NRGD), with support from the Climate Technology Centre and Network (CTCN), this project aims to assess soil erosion using advanced atomic absorption techniques. RCMRD's role is to enhance technological capacities and address information gaps, thereby contributing to climate-resilient agriculture and food security in Sudan.

Despite political challenges leading to temporary project delays, plans are underway to collect soil nutrient data, followed by the development of a model to identify areas susceptible to erosion. Additionally, RCMRD, in collaboration with NRGD and CTCN, has conducted a semi-detailed soil survey at the Food Security Project site, encompassing soil profile descriptions and classification.

Looking ahead to 2024, the team is gearing up for capacity enhancement in remote sensing tools and the application of the RUSSLE model to estimate areas prone to soil and wind erosion. Stakeholder engagement and validation of model outputs are integral components, ensuring the dissemination of findings to a broader audience, including universities, government departments, and local communities.

d. Risk Management System for Plant Pests and Diseases in Kenya (RMSPP)

The project, which is funded by the Bill & Melinda Gates Foundation, is being implemented in Kenya through the lessons learned and gaps identified during the Alliance for a Green Revolution in Africa (AGRA)

project. The aim is to improve the climate adaptive capacity of agricultural systems by supplementing existing agricultural risk monitoring and management programs with relevant information on climate-driven pest and disease hazards. So far, various milestones have been completed within the project. Key reports submitted include the kick-off workshop, working session/user engagement workshop, and training reports. Additionally, the infrastructural system assessment of stakeholders, technical landscape analysis, and county information centre assessment were completed. A geoportal, RMSPP mobile application, and project website were developed. The infrastructure has already been deployed to the directorate and the counties (Kakamega, Kilifi, and Nyeri). The SERVER installation and networking have been successfully completed at the Plant Protection and Food Safety Directorate.

e. Food retail mapping for Nairobi City County under the Integrated actions for innovative food system across rural-urban 'communities

The project was implemented in Kenya within the city of Nairobi with funding from the Food and Agriculture Organization (FAO). The main objective of the project was identification of the origin and diversity of food supply sources and gaps based on market data. Key activities implemented include mobile application, geoportal, and training of county officers on data collection, geoportal utilisation, and administration. The products developed were utilised to meet the Nairobi government plan for the Rapids Results Initiative.

It was envisioned that the county would be in a better position in terms of identifying trends in consumption from the analytics of the dashboards and information on nutritional diversity for better planning of the food environment and reduction of food waste in the city. After the completion of the project, a gap was identified with the traders who would also want to utilise the information. In this regard, progress is being made towards supporting the co-development of an application to have the traders get market prices, location of commodities, and other relevant information from the geoportal..

f. Helmets Labelling Crops

In the dynamic area of Agriculture and Food Security, innovative solutions are continuously sought to enhance monitoring and decision-making processes. One of our projects 'Helmets labelling crops' embarked on a mission to revolutionise data collection practices in Zambia. Leveraging cutting-edge technologies, such as Go-Pro cameras mounted on motorbike riders, the project facilitated rapid and comprehensive data collection across the agricultural landscape.

This innovative approach not only expedites data gathering but also addresses challenges posed by terrain and cloud cover, particularly in regions where traditional optical sensing-based satellite imagery may be limited. A total of 27 agricultural officers were trained to utilise this technology, spearheading data collection efforts across six districts: Chongwe, Chibombo, Mpongwe, Solwezi, Kalomo, and Kazungula.

g. Soils4Africa

RCMRD was awarded the Soils4Africa project by the Horizon 2020 program of the European Union for four years. The project aims to build an open-access soil information system (SIS) for Africa with key indicators, underpinning data, and standardised methodologies for repeated soil monitoring. The Soil Information System (SIS) will ultimately enable farmers, agribusinesses, scientists, and policymakers in their efforts towards sustainable intensification of agriculture and boosting food security by improving the quality and availability of African soil data. The project's ongoing work includes soil sampling on agricultural land in Africa, laboratory analysis, development of the soil information system, and stakeholder engagement.

WEATHER, CLIMATE CHANGE AND IMPACTS

a. *Earth observation and environmental sensing for climate-smart sustainable Agro-pastoral ecosystem transformation in East Africa (ESSA)*

This project is being implemented in Ethiopia and Kenya (2020–2024). The objective is to contribute to pastoralist households' transition towards climate-smart agropastoral systems in sub-Saharan Africa (Ethiopia and Kenya) by understanding the dynamics of and interlinkages between tropical upland forest cover and semi-arid lowland landscapes and the multifunctionality of agropastoral landscapes through a system-wide view of food and nutrition security, diversified livelihoods, and ecosystem sustainability. The study areas are Munessa and Yebelo in Oromia Region (Ethiopia) and Kajiado, Machakos, Makueni, and Taita Taveta (Kenya). The University of Helsinki is leading project implementation.

Activities implemented include preliminary fieldwork in Taita Taveta and ground-truth data on water pans, training of stakeholders in an advanced remote sensing course, and a platform for PhD students to present their works and partners under the ESSA project. A prototype rangelands Decision Support Tool (RDST) for Ethiopia has been developed. The Centre's role is to provide remote sensing land cover and pastoral area data and have one staff member trained to PhD level. Preliminary research work focusing on water pan mapping in Taita Taveta County under PhD study by one staff member was completed.

b. *Strengthening Weather and Climate Services for Resilience Building*

RCMRD has made significant progress in enhancing weather and climate services for resilience building. During this effort, stakeholders from the Nation Drought Management Authority (NDMA) underwent comprehensive training on integrating Dynamic Rainfall Index Prediction (DRIP) forecasts into their early warning bulletins for the five Arid and Semi-Arid Land (ASAL) counties in Kenya: Garissa, Isiolo, Marsabit,

Photo Credit:Greenlife Crop Protection Africa.

Turkana, and Wajir. This training, focused on utilising Earth Observation (EO) data for forecasting and product development, represented a critical success in improving early warning action planning. By integrating DRIP forecasts into early warning bulletins, RCMRD aims to strengthen water and food security while mitigating drought emergencies, thereby fostering resilience within vulnerable communities.

c. Strengthening Climate Change Transparency: COMESA Member States' Capacity Building Initiative

In the face of escalating climate change challenges, the need for transparent and accountable climate action has never been more pressing. Recognizing this imperative, an initiative led by Conservation International, a Global Environment Facility (GEF) Implementing Agency, in collaboration with COMESA, RCMRD, the Gaborone Declaration for Sustainability in Africa (GDSA), and the governments of Comoros, Eritrea, the Seychelles, and Zambia, is set to transform climate change monitoring, reporting, and verification (MRV) across Eastern and Southern Africa.

The five-year Capacity Building Initiative for Transparency (CBIT) project is poised to revolutionise the transparency landscape within COMESA Member States, aligning their efforts with the requirements of the Paris Agreement. At its core, the project aims to establish a robust Eastern and Southern Africa Regional CBIT transparency framework, facilitating the meticulous monitoring, reporting, and verification of climate actions and Nationally Determined Contributions (NDCs).

The project's inception phase commenced with meetings held in Eritrea, the Seychelles, and Zambia, laying the foundation for widespread stakeholder engagement and awareness. These meetings served as crucial platforms for fostering understanding among stakeholders regarding the project's objectives and their crucial roles therein. Moreover, they provided invaluable insights into each country's current status in terms of reporting MRV requirements, including biennial updates to the United Nations Framework Convention on Climate Change (UNFCCC).

During the inception meetings, participating countries candidly shared their experiences, challenges, and aspirations regarding climate change reporting. From grappling with data collection hurdles to navigating complex reporting frameworks, each country articulated its own unique set of challenges and areas requiring support. These insights will inform tailored capacity-building interventions, ensuring that the project's initiatives are precisely calibrated to address the evolving needs of each member state.

Moving forward, the Capacity Building Initiative for Transparency project is poised to catalyze a paradigm shift in climate change governance across Eastern and Southern Africa. By fostering transparency, accountability, and knowledge dissemination, the project holds the promise of unlocking unprecedented opportunities for collective action and sustainable development in the face of climate change uncertainty. Through collaborative efforts and shared commitment, COMESA Member States are poised to lead the charge towards a resilient and climate-resilient future for generations to come.

Source-freepik

Drought condition in Northern Kenya

ECOSYSTEMS MANAGEMENT AND NATURAL RESOURCE MONITORING

a. The Global Monitoring for Environment and Security and Africa (GMES and Africa)

The relevance of natural resource monitoring cannot be overstated, particularly in the face of escalating environmental challenges. Recognizing this urgency, the Regional Centre for Mapping of Resources for Development (RCMRD) has remained steadfast in its implementation of the Global Monitoring for Environment and Security and Africa (GMES and Africa) project.

With a keen focus on three service areas—Land Degradation Monitoring and Assessment, Wetlands Monitoring and Assessment, and Open Geographic Reference Regional Vector Database for Water and Agro-ecological Zoning—the project has been critical in enhancing capacity and fostering collaboration in Earth Observation (EO) technologies across 14 countries: Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, and Uganda.

Throughout 2023, the project demonstrated its commitment to capacity building and knowledge dissemination, with 21 participants from these countries undergoing intensive EO training. Leveraging online platforms, over 700 participants were further empowered, underscoring the project's dedication to inclusivity and accessibility.

Noteworthy investments in research and tool development, exemplified by Makerere University's Wetlands Vulnerability Analysis training and scholarship awards for research in EO, have propelled innovation and knowledge creation in the field. Collaboration with private sector firms has yielded essential tools for mapping and assessment, while regional workshops have served as hubs for policy discussions and the utilization of EO tools for sustainable development challenges.

Notably, the project has supported the Directorate of Resource Surveys and Remote Sensing (DRSRS) Kenya with Land Degradation Index Maps (LDIM), which have been used in

Yalla Swamp

the tree planting initiative launched by His Excellency the President of Kenya, Dr. William Samoei Ruto, to guide land-degraded areas that require restoration interventions. As a contribution towards this initiative, DRSRS has developed the JAZAMITI Application, a geoportal application set to transform the way Kenya monitors and manages its nationwide tree planting efforts.

b. Biodiversity and Protected Areas Management (BIOPAMA)

Venturing into the area of ecosystems and natural resource management, the Biodiversity and Protected Areas Management (BIOPAMA) program emerges as a beacon of conservation efforts across African, Caribbean, and Pacific (ACP) countries. The BIOPAMA program aims to improve the long-term conservation and sustainable use of natural resources in African, Caribbean, and Pacific (ACP) countries, in protected areas, and surrounding communities.

At the helm of this is the establishment of the BIOPAMA Regional Resource Hub (RRH) for Biodiversity and Protected Area Management, a monumental initiative spearheaded by the RCMRD.

In a stride towards data-driven conservation, the RRH hosted the 2nd edition of the Data Training Workshop on Protected and Conserved Areas at RCMRD in 2023. With over 100 participants from 24 countries in Eastern and Southern Africa, the workshop underscored the important role of data and information in shaping decision-making processes for the governance and efficacy of protected and conserved areas. Delving deeper, participants engaged in discussions on the State of Protected and Conserved Areas Report 2023 (SOPACA II) and delved into the information management process of the RRH, emphasizing active engagement with the Regional Reference Information System (RRIS). Furthermore, the RRH's global footprint expanded as it contributed insights and expertise to the development of the East African Community's (EAC) Wildlife Conservation and Management Strategy while also championing the development of the RRH-RIS, a comprehensive information system tracking conservation indicators and pressures across 24 countries in Eastern and Southern Africa.

RRH has been identified as a Regional Centre of Excellence for East and Southern Africa, set to implement biodiversity and forest components. The RCoEs are the European Union's support for the use of science, technology, and innovation (STI) for the green transition and sustainable development in the main dimensions of the Green Deal: forests and biodiversity, water, oceans, energy, sustainable agriculture, and climate change. The overall objective of the project is to ensure forests, biodiversity, and seascape ecosystems in Eastern and Southern Africa are sustainably managed, continue providing ecosystem services, and contribute to the well-being of the populations by providing improved, regular, and updated information for informed decision-making. RCMRD will play an active role in helping the 24 countries in our region tackle the challenges surrounding biodiversity and forestry. https://esahub.rcmrd.org/

c. East and Southern Africa Forest Observatory (OFESA)

The East and Southern Africa Forest Observatory (OFESA) aims at providing streamlined information on the trends and threats to forests in Ethiopia, Kenya, Mozambique, Tanzania, and Uganda in order to support better decision-making to improve the management of forests. During the year, the geoportal was updated with more data, along with a forest reserve dashboard and protected area. The Geoportal seeks to foster data sharing in the region. OFESA is jointly led by the Center for International Forestry Research (CIFOR) and the RCMRD. This initiative is funded by the European Union. http://ofesa.net/

In 2023, OFESA created a coherent governance framework that enables participating countries to share, use, and analyse data and, secondly, ensures that countries and regional organizations are provided with the information they need. Under training, one training was conducted on forest-related hotspot mapping and BIOMASS estimation in Kenya and Mozambique, and a 2-day governance framework workshop was held in Uganda with key stakeholders from government ministries in a session that shared insights into governing forest data sharing and management. As recommendations, participants evoked the need for standardisation of data-sharing

Source-Africa Nature Tourism

processes and methodologies, the inclusion of institutions that can validate the data researched, and finally, the need for trust to be established between all parties to avoid data manipulation.

OFESA, in collaboration with MJUMITA-Tanzania Forest Community Network, is implementing forest monitoring initiatives in Tanzania's Rufiji and Kilosa districts. Key activities included upscaling low-cost monitoring initiatives by building the capacity of community scouts and forest rangers. In Rufiji, the focus was on integrating forest monitoring into existing governance tools, with a web-based village forest and governance tool developed. Village resource committee members undergo training to utilise the tool, enabling digital data collection and enhancing accountability in forest management.

d. Africa Nature Based Tourism

This project aims at facilitating access to COVID-19 relief and recovery funding for communities, nature-based tourism enterprises, and conservation areas in southern and eastern Africa. The COVID-19 crisis has crippled economies and industries all over the world, and nature-based tourism has been one of the leading economic casualties. For many Southern and Eastern African countries, this means a significant loss of funding for their conservation operations, local community livelihoods, and tourism enterprises.

In response, with funding from the Global Environment Facility (GEF) via WWF-US, the African Nature-Based Tourism Platform connects funders to the communities and small and medium enterprises most in need of funding support. Using a bottom-up approach, the platform gathers data on impacts on communities and SMEs from the COVID-19 crisis, enhances knowledge sharing between relevant actors, facilitates the development of funding proposals from communities and SMEs, and makes these available to relevant donors. Project focal geographies include Botswana, Kenya, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe.

The activities implemented in the year 2023 included collating data using the survey data collection platform and designing and launching the map data viewer. The database for all the surveys undertaken in all countries was updated. In addition, the dashboard was updated and is accessible at this link: naturebasedtourism.africa/data/. A total of 687 surveys were conducted in 11 participating counties. RCMRD also created country-specific maps that serve as input to the county summary reports. https://naturebasedtourism.africa/

e. Digital Earth Africa (DEA)

In the pursuit of harnessing the transformative power of Earth observation (EO) satellite imagery for Africa's benefit, RCMRD serves as one of the implementing partners for Digital Earth Africa (DE Africa). Digital Earth Africa provides continental analysis-ready Earth observation data services. These services provide government, industry, and researchers with valuable information and insights to help address social, environmental, and economic change on the continent, develop an ecosystem for innovation, and address the challenges of sustainable development across sectors.

In 2023, RCMRD supported the implementation of DE Africa activities, focusing on two crucial thematic areas: coastline monitoring and wetland monitoring and assessment in Eastern and Southern Africa. The activities undertaken under Coastlines Monitoring included the validation and collection of ground data for Kenya and Tanzania. Subsequent capacity-building events were conducted, ensuring that key stakeholders were adept at utilizing the coastline's products and services and the skills to navigate the DE Africa Sandbox, utilize data, and leverage the program's products effectively. In the realm of wetlands monitoring and assessment, RCMRD contributed to the development of wetlands inventory maps for the Lake Victoria region in Kenya and Uganda. The objectives entailed mapping wetlands, employing DEA tools like the Wetlands Insight

Tool (WIT), identifying change drivers, and proposing interventions while disseminating critical information to stakeholders. On the sidelines of the 7th RIC 2023, DEA launched its satellite office at RCMRD.

f. GEO Mountains Small Grants Project

Within the broader framework of the Group on Earth Observations (GEO), the GEO Mountains Initiative stands as a beacon of collaboration, aiming to unite research institutions and mountain observation networks. The primary objective is to enhance the discoverability, accessibility, and usability of diverse data and information related to environmental and socioeconomic systems across global mountain regions. This initiative, operating both in situ and remotely sensed domains, envisions contributing to scientific advancements and providing crucial support to practitioners and decision-makers at local, national, and regional levels.

In alignment with the objectives of the GEO Mountains, the Swiss Agency for Development and Cooperation (SDC) launched a small grant call through the Adaptation at Altitude Programme. The call invited projects explicitly exploring mountain monitoring, data, and information, with a focus on key mountain regions including the Andes, Central Asia, East Africa, the Caucasus, and the Hindu Kush Himalaya. The project saw the development of a satellite-based monitoring framework for landscapes around the Mt. Kenya region.

Field visit on mapping of invasive species in Laikipia County, Kenya

LAND USE, LAND COVER AND GOVERNANCE

a. Malawi Land Information Management System for Malawi

In 2021, RCMRD, Spatial Dimension South Africa Limited, and Africa Bees Limited (UK) and Kennedy Z36 Systems (Malawi) signed a contract with the Ministry of Lands Malawi under the World Bank-financed Agricultural Commercialization Project (AGCOM) to implement a National Land Information Management System (LIMS).

The project activities conducted in the year include LIMS user and system administration training and User Acceptance Testing (UAT). The user training's objective was to build the capacity of Ministry of Lands staff to use the LIMS software platform, Malawi LIMS Landfolio. The training focused on equipping the participants with theoretical and practical skills to register and process different land transactions on the Malawi LIMS Landfolio platform. The capacity-building activities were conducted in readiness for the Go-Live phase set to begin in October 2023, when the LIMS was set for commissioning and operationalization.

b. Enhancement of Malawi Customary Land Mapping Tool

The RCMRD developed software in 2019 compliant with Malawi's land-related laws governing customary land, mainly the Customary Land Act (2016), and utilizes geospatial technologies such as digital survey forms, Global Navigation Satellite Systems (GNSS), high-resolution satellite imagery, and open-source desktop GIS.

During the year, the system was enhanced with features that include online transmission of data collected to a central database or server, streamlined data processing workflow, and the ability to overlay physical planning information(e.g. village land use plans) during the demarcation of parcel boundaries. In addition, an online dashboard was developed to assist in tracking the progress of customary estate registration by providing indicators and statistics such as the number of parcels demarcated per category (individual, joint, or

Photo Credit:globalblackhistory-Malawi

communal), land use and area, the number of applicants by gender per category, and the number of GVH (villages) demarcated per the Traditional Land Management Authority (TLMA).

c. Land Governance Help Desk (AUDA - NEPAD Project)

This program aims to make available data and produce evidence to raise understanding at the country and continental level of the role of land governance for Africa's structural transformation, sustainable development, climate change adaptation, and opportunities for investing in the land sector. The current phase involves 10 countries, i.e., Uganda, Ethiopia, Ghana, Botswana, Namibia, Mali, Benin, Burkina Faso, Madagascar, and Cameroon.

The following activities were undertaken in the year: development of the land help desk, country data collection, and establishment of helpdesks on land governance. Strengthening the capacities of helpdesks to use fit-for-purpose tools for data collection, analysis, and information management, trained users on how to use the land help desk. Created awareness at the country level of the role of good land governance for Africa's social and economic transformation.

d. Land Use Land Cover and Change Mapping

In partnership with the Water Resources Institute (WRI), a regional exchange on the Landscape Accelerator for Afri100, which supports landscape restoration targets on degraded land, was conducted, where tools such as Time Sync and Collect Earth Online were showcased. The exchange also addressed the monitoring levels designed through the Google Earth Engine for degradation monitoring.

e. NELGA Land Data Hub (NELGA Project)

The Network of Excellence on Land Governance in Africa (NELGA) is a partnership of leading African universities and research institutions

with proven leadership in education, training, and research on land governance. NELGA notably aims to promote research in the field of land governance and to provide necessary data to support government policy and program implementation as well as monitoring. The project is implemented in four countries, i.e., Tanzania, Botswana, Senegal, and Rwanda.

A cornerstone of NELGA's initiatives is the establishment of the NELGA Land Data Hub, which will accumulate country- and region-specific sources of land-related information, guide the user in obtaining this information, provide necessary data to monitor government policy and program implementation in the land sector, and enable researchers across the continent to carry out applied research to inform policy dialogue.

Through sensitization training on the geoportal and policy engagement discussions with stakeholders such as the Africa Land Policy Initiative (ALPC), NELGA ensures that its initiatives are effectively disseminated and utilized by relevant stakeholders. http://datahub.nelga.org/
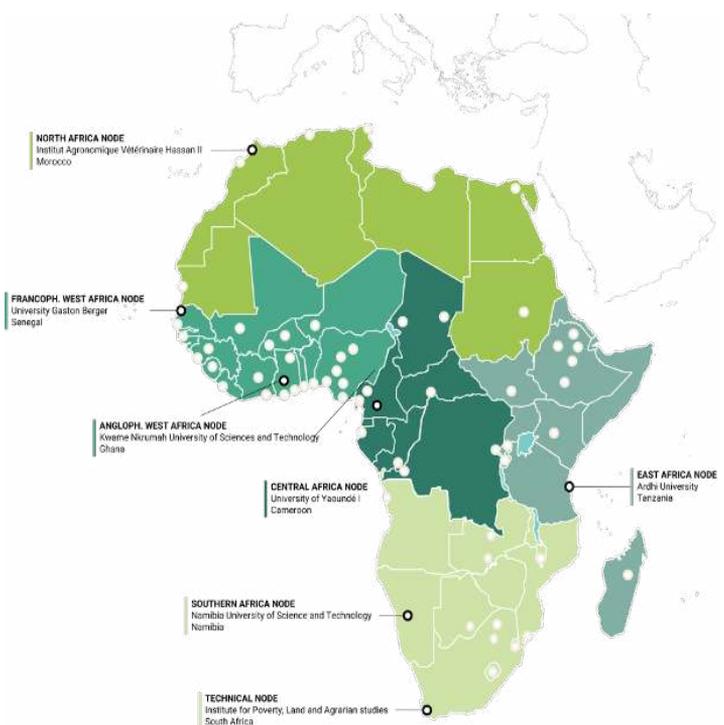
The NELGA partner institutions across Africa

WATER RESOURCES AND HYDRO-CLIMATIC DISASTERS SERVICES

a. Establishment of Community Based flood early Warning Systems (CBFEWS) in selected flood prone districts of Malawi.

In a concerted effort to mitigate the impact of floods in Malawi, RCMRD, in a joint venture with EMD Consulting Engineers, embarked on the implementation of the Community-Based Flood Early Warning Systems (CBFEWS) project in 10 flood-prone districts of Malawi.

The CBFEWS project is funded by the World Bank and implemented through the Ministry of Water and Sanitation under the Malawi Resilience Disaster Risk Management Project. The CBFEWS project is a proactive response to the recurrent floods that devastate communities in southern Malawi. By installing 40 early warning stations along flood-prone rivers, the project seeks to provide timely alerts and empower communities to take preemptive measures in the face of impending floods.

The initial phase of the project saw the submission of an inception report outlining the project's approach and objectives. A comprehensive scoping and survey exercise was conducted to identify suitable locations for CBFEWS instrumentation, ensuring strategic placement to maximize effectiveness. These findings were instrumental in designing the early warning system, laying the groundwork for its implementation.

As the project progresses, the consulting team will collaborate closely with the Ministry of Water and Sanitation to procure the necessary instruments and oversee the installation of the CBFEWS infrastructure. With the rainy season approaching, swift action is imperative to ensure the system is operational and communities are adequately prepared to mitigate the impact of floods.

Source-freepik

The collaboration between RCMRD, EMD Consulting Engineers, and the Ministry of Water and Sanitation exemplifies the power of partnership in addressing complex challenges such as flood resilience. By leveraging expertise, resources, and innovative solutions, the CBFEWS project holds the potential to save lives, protect livelihoods, and build resilience in vulnerable communities across Malawi.

As the project unfolds in the coming months, stakeholders remain committed to its success, underscoring their dedication to fostering a safer and more resilient future for all Malawians. Through collective action and proactive measures, the CBFEWS project represents a significant step forward in strengthening Malawi's capacity to withstand the impact of natural disasters and build a more resilient nation.

Installation of Telemetric station-an early warning system in Malawi

DISASTER RISK REDUCTION AND MANAGEMENT

a. Environmental Monitoring, Hazard Mapping and Atlases

In 2023, the Hazard Risk Mapping and Atlases preparation project for Narok County in Kenya, which covered different types of hazards occurring in the counties with a focus on drought, floods, land degradation, diseases (human, livestock, and crops), human conflicts, human and wildlife conflicts, and many others, was completed. Validation with all stakeholders, including the National *Disaster* Operations Centre (NDOC), NDMA/UNDP, and the county staff, was conducted, and the Hazard Atlas second validation process and proofreading were completed. A total of 34 staff from the county government, local community representatives, and NGO were trained on 'Hazard Mapping using Geoinformation Techniques'.

b. Strengthening of the Network of Excellence for Disaster Risk Reduction in Africa

Disaster risk management is a critical aspect of ensuring the safety and resilience of communities in Africa, particularly in the face of increasing climate-related hazards. Recognizing the importance of proactive measures in mitigating the impact of disasters, a collaborative project has been initiated with the objective of enhancing the use of risk information to support preparedness efforts across the continent.

Led by partners including Centro Internazionale in Monitoraggio Ambientale (CIMA) in Italy, the Centre of the West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) in Burkina Faso, Partners Enhancing Resilience of People Exposed to Risks (PeriPeriU) in South Africa, and the Intergovernmental Technical Centre for Disaster Risk Management, Sustainability, and Urban Resilience (DiMSUR) in Mozambique, this project aims to strengthen disaster risk management capabilities in Africa.

During the initial phase of the project, which took place from February to July 2023, significant progress was made in establishing

Source: freepik

the governance structure for the network. This foundational step laid the groundwork for creating a common understanding of the scope, composition, and functioning of the network, fostering collaboration and synergy among the partners.

As the project enters its second phase, from October 2023 to April 2024, the focus shifts towards enhancing the availability and access to risk information. This includes improving the capacity of African institutions in existing Multi-Hazard Early Warning Systems (MHEWS) tools and Early Warning Systems (EWS) through secondment and expert exchanges. Additionally, efforts will be accelerated to establish a coordination and management framework for the proposed African Network of Excellence (NoE) network.

The collaborative nature of this project underscores the importance of partnership and knowledge sharing in strengthening disaster risk management across Africa. By leveraging expertise and resources from diverse institutions and regions, the project aims to build a more resilient continent better equipped to anticipate, prepare for, and respond to disasters.

As the project progresses, stakeholders remain committed to advancing disaster risk management efforts in Africa, recognizing the crucial role of early warning systems and risk information in saving lives and protecting livelihoods. Through collective action and collaboration, the project holds the promise of enhancing the continent's capacity to address the challenges posed by natural disasters and build a more resilient future for all Africans.

c. *Assessment of early warning systems in four Indian Ocean Islands States*

The key objective of this project is to conduct an analysis of existing multi-hazard Early Warning-EAASs (MHEW-EAASs) in four Indian Ocean countries (Comoros, Madagascar, Mauritius, and the Seychelles) for systems that encompass several hazards that may occur alone, simultaneously, cascading, or cumulatively over time. Taking into account the potential interrelated effects, along with the related early and anticipatory actions to prevent or reduce the related loss and damage, is the main focus of this project.

d. *Forecast and Early Warning System (Disaster Management Theme)*

During this reporting period, Nation Drought Management Authority (NDMA) stakeholders were trained on the DRIP forecasts for their early warning bulletins for the 5 ASAL counties in Kenya, which include Garissa, Isiolo, Marsabit, Turkana, and Wajir. This training focused on using the EO data, performing forecasts, and overall product development. The integration into the early warning bulletins was a major success in this activity since it will build into early warning action planning to further enhance water and food security and reduce drought emergencies.

Aerial view of the flooded village in Mozambique after a cyclone.

CONTINENTAL INITIATIVES

AfriGEO

In the spirit of advancing Africa's active engagement in the Group on Earth Observations (GEO), RCMRD serves as the Secretariat for AfriGEO, an initiative uniting the African community in GEO. In 2023, there was a fruitful exchange with the GEO LDN Secretariat, where representatives visited RCMRD along with partners such as the Global Partnerships for Sustainable Development Data (GPSDD), the University of Nairobi, UN-Habitat, and the GIZ mission office. This collaborative mission focused on determining the potential contributions of various partners towards achieving Land Degradation Neutrality (LDN) targets, aligning with Sustainable Development Goal 15.1. RCMRD's designation as the Regional Help Desk host, coupled with the provision of Massive Open Online Courses (MOOCs) and technical support to member countries, underscores its commitment to advancing LDN reporting and fostering sustainable land management.

Additionally, the 7th AfriGEO Symposium, held successfully from September 18th to September 23rd, 2023, in Swakopmund, Namibia, marked another highlight in RCMRD's impactful journey. The symposium served as a platform for knowledge exchange, collaboration, and innovation, bringing together experts, stakeholders, and decision-makers to address key challenges and opportunities in Earth observation across the African continent.

A Group photo of AfriGEO Symposium participants held in Swakopmund, Namibia.

The following are the AfriGEO Regional Institutions:,

RCMRD, Africa Centre of Meteological Application for Development, Economic Community of West African States, Global Partneship for Sustainable Development Data, Africa Climate Change Research Centre, Observaroire du Sahara et du Sahel, African Regional Centre for Space Science and Technology Education, African Regional Institute for Geospatial Information Science and Technology, United Nations Economic Commission for Africa, South African National Space Agency (SANSA)

OTHER MANDATES

Geospatial Data and Infrastructure Development

Capacity Building & Training

Knowledge Management
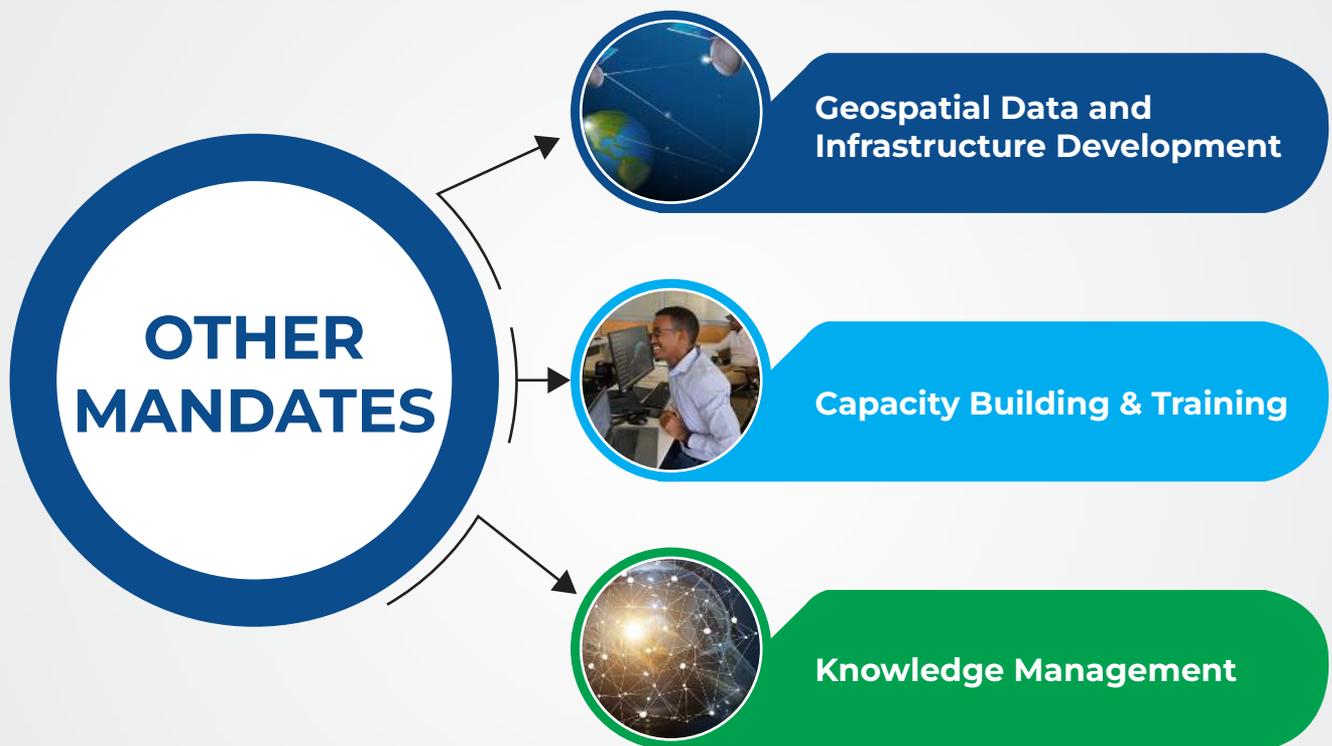
GEOSPATIAL DATA AND INFRASTRUCTURE DEVELOPMENT

a. Spatial Data Supply

In 2023, the sale of high-resolution datasets, including imagery and elevation data, generated approximately 158,000 USD, underscoring the demand for quality geospatial information.

Moreover, over 3,000 earth observation datasets were disseminated to research institutions, students, and clients through our available geoportal, physical collection, and data links.

0.4-metre high-resolution satellite image for Ruaraka

b. Engineering Services; Calibration, maintenance and repair of survey equipment

The Engineering Section extended its expertise to private clients. Notably, in 2023, it offered services to private companies such as Real Contractors Rwanda and 3 instruments for Achellis Tanganyika.

Complementing these technical services, the section conducted comprehensive training sessions, equipping technicians from member States with the necessary skills to maintain and operate various surveying equipment. The training initiative contributes to building a skilled workforce capable of managing surveying instruments.

Moreover, the section focused on enhancing its calibration system and securing authorizations from major instrument manufacturers such as Trimble and Geomax. Collaborative efforts with Trimble included a 4-day training program for RCMRD Service engineers, expanding the scope of instruments repairable and maintainable within the workshop.

The Centre was granted Geomax authorization to service Geomax Surveying Instruments and therefore acquired some Geomax tools and special service software. Special calibration software and annual licences for servicing Leica Surveying instruments were renewed and to access Leica service software and technical support. The section also invested in marketing initiatives, conducting visits to various Kenya County government offices such as Kilifi, Kwale, Voi, Homabay, Migori, Kisii, and parastatals like KENHA, KURA, KERRA, and the National Housing Corporation.

CAPACITY BUILDING & TRAINING

To strengthen the capacity of our members and other stakeholders in geo-information and allied technologies, the training table below shows the trainings conducted in member States and beyond.

	Training	Total Participants	Participating Countries	Mode of Training
1	Wetland Vulnerability Analysis Tool Training	126	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania Uganda	Virtual
2	Land Productivity Analysis Training	313	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda	Virtual
3	Wind erosion modelling Training	174	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda	Virtual
4	Socio-Economic Valuation of Degraded Lands and Wetlands Training	106	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania and Uganda	Virtual
5	GMES & Africa Thematic Training	21	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Tanzania and Uganda	Virtual
6	Development of Triggers and Thresholds for Garissa County for Anticipatory Actions Against Drought Hazard	29	Kenya	Physical
7	Training and testing rapid crop label data collection using GoPro cameras in Zambia	27	Zambia	Physical
8	Wetlands Vulnerability Analysis	357	Kenya, DRC, South Africa, Nigeria, Somalia, India, Pakistan, Ghana, Ivory Coast, Ethiopia, Togo, Rwanda, Cameroon, Peru, Morocco, Germany, Liberia, Tanzania, Zimbabwe	Virtual
9	Introduction to Remote Sensing & GIS and Image Analysis Using the DEA Platform Training in wetland monitoring and coastal erosion	51	Kenya, Tanzania, Uganda	Virtual
10	Regional Food Balance Sheet Training	11	Zambia	Physical
11	Joint Training between ISK/RCMRD on Emerging Trends and the future of Surveying and Mapping	33	Kenya, Tanzania	Physical
12	AFREF Training	62	Kenya, Uganda, Tanzania, Zimbabwe, South Africa, Lesotho, Mauritius, Comoros, Botswana, Rwanda, Malawi, Eswatini, Zambia, Burundi, Namibia and Eswatini	Physical
13	Dynamic world Training and Mapathon	50	Kenya	Physical
14	ArcGIS Pro	4	Kenya	Physical

15	Geographic Information systems	44	Kenya & Somalia	Physical
16	Advanced Spatial Analysis	1	Uganda	Physical
17	GIS in Epidemiology	8	Malawi	Physical
18	Agro-Ecological Zones digitization and updating	30	Kenya	Virtual
19	Agro-Ecological Zones - Geoportal user and administrator training	12	Kenya	Virtual
20	Food Retail Mapping - Mobile data collection and geoportal user training		Kenya	Physical
21	Food Retail Mapping - Geoportal administrator training	6	Kenya	Physical
22	Risk Management System for Plant Pests and Diseases Project - Introduction to RS and GIS (2 Groups)	154	Kenya	Physical
23	Risk Management System for Plant Pests & Diseases Project - Gender, Leadership, Communication, Monitoring and Evaluation	34	Kenya	Physical
24	Basic training in Photogrammetry	5	Kenya	Physical
25	GIS Hazard Mapping Training for Narok County Officials	36	Kenya	Physical
26	Instrument Repair Training	15	Eswatini, Botswana, Burundi, Ethiopia, Kenya, Lesotho, Malawi, Namibia, Sudan South, Sudan, Tanzania, Uganda, Zambia, Zimbabwe	Physical
27	Training on Earth Observation Data Manipulation with the Digital Earth Africa Sandbox - RIC Pre-conference training	120	Benin, Burkina Faso, Cameroon, China, Ethiopia, Ireland, Kenya, Lesotho, Malawi, Namibia, Nigeria, Rwanda, South Africa, Tanzania, USA, Uganda, Zambia, Zimbabwe	Physical
27	Malawi LIMS User Training	21	Malawi	Physical
28	Malawi LIMS System Administration Training	26	Malawi	Physical
29	GIS for Land Administration	5	Rwanda	
	BIOPAMA Regional Resource Hub Data Training for protected and conserved areas	80	Angola, Botswana, Comoros, Djibouti, Eritrea, Eswatini, Ethiopia, Italy, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Somalia, South Africa, Sudan, Tanzania, Uganda, Zambia & Zimbabwe	Physical
30	OFESA Forest related training in hotspot mapping and BIOPAMA estimation – Kenya Chapter	24	Kenya	Physical
31	OFESA Forest related training in hotspot mapping and BIOPAMA estimation	20	Mozambique	Physical
32	Total	2,005		

RCMRD

In 2023, Regional Centre Training Institute (RCTI) marked significant achievements and advancements in its pursuit of excellence in geospatial information technology (GEO-IT) training. The institute offered comprehensive GEO-IT training programs, namely, diplomas and certificates in Land Surveying, Cartography and GIS, Photogrammetry and Remote Sensing, IT, and KASNEB.

A total of 1,124 students were trained during the reporting period, and an additional 269 students undertook International Certification in Digital Literacy (ICDL) and other short ICT and geospatial corporate courses, contributing to the professional development of individuals across various sectors. In recognition of its commitment to excellence, RCTI received approval as a KASNEB Students Training and Examination Centre following the launch of the courses in the year. To foster collaborations and broaden its training and capacity-building portfolio, the institute established three Memoranda of Understanding (MoUs) with Embu University, Fahari Aviation, and ADCC International

Practical session at Regional Centre Training Institute

KNOWLEDGE MANAGEMENT

a. RCMRD Open Data Geoportal

RCMRD utilized this extensively to disseminate information and datasets on behalf of other project partners. The geoportal saw 500,000 visits in 2023. In 2023, the geoportal received 500,000 visitors. This is one of the most popular Geoportals in the region and encourages Member States to share their datasets using this channel. This applies to datasets that the Member States want to avail of for regional use and awareness.

b. Observatories and Repositories

A number of observatories and repositories were developed, upgraded, and launched in the year. They include OFESA Geoportal (https://ofesa-geoportal.rcmrd.org/), RCMRD GMES & Africa Geoportal (https://gmesgeoportal.rcmrd.org/), BIOPAMA Regional Resource Hub Regional Reference Information System, AGRA Geoportal, the Network of Excellence on Land Governance in Africa Web Portal and Data Repository, and the Land Help Desk platform in conjunction with AUDA-NEPAD's Land Governance Programme. Additionally, an e-learning platform was updated to accommodate a number of online project-related courses for various professionals, as well as short online courses offered by RCTI and project-specific tailored training.

Popular Apps & Data Dashboards

Protected Areas in Eastern and Southern Africa...	Chinese Financed Projects from 2000 to 2014	Africa Biomes Data Dashboard	AgroEcological Zone Statistics Dashboard
This dashboard shows the protected areas we have in the 24...	This data dashboard shows all the Chinese Financed Projects from...	Biomes are distinct biological communities (collection of plants...	Agro-ecological zones (AEZs) are land units defined on the basis of...
View Dashboard	View Dashboard	View Dashboard	View Dashboard

RCMRD

INVESTMENT AND OPPORTUNITIES
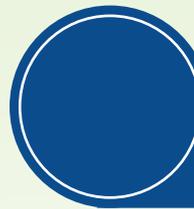
RCTI Hostel and Executive Suites
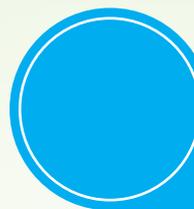
Sporting Facilities

Human Capital

Acquisition of Drones
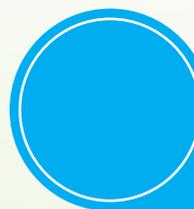
GMES & Africa Internship opportunities

RCMRD Map Competition 2023 Edition

RCMRD In 2023   Mapping For Sustainable Development   29

RCTI HOSTEL AND EXECUTIVE SUITES

The year 2023 marked a milestone for RCMRD infrastructure development with the inauguration of the RCMRD Complex and the Regional Centre Training Institute (RCTI) hostel on an occasion presided over by the Chief Guest, the Cabinet Secretary, Ministry of Lands, Public Works, Housing, and Urban Development, Hon. Alice Wahome, representing the President of Kenya, HE William Ruto.

The newly opened 800 bed capacity RCTI Hostel and executive suites

A view of the executive room of the RCTI hostel

HUMAN CAPITAL

Under the human capital theme with the overall goal of a competent workforce, the strategic plan encompasses the following objectives: strengthening policies and systems for best HR practices; enhancing staff skills and competence; and enhancing staff work environment and welfare. In pursuit of these objectives, the Centre under the Geospatial Service Directorate employed six staff members to fill the following roles:

SPORTING FACILITIES

We boast about our state-of-the-art sporting facilities at RCTI, catering to the holistic development of our students. With a commitment to nurturing both physical fitness and recreational pursuits, we offer a diverse array of amenities, including well-maintained sports fields, a swimming pool, and outdoor courts for basketball and football. These facilities not only promote physical well-being but also foster teamwork, discipline, and a spirit of healthy competition among the trainees, enhancing their overall learning experience and preparing them for the challenges ahead.

Mr. Abednico Maphuru
Director of Geospatial Services

Peninah Njogu
Technical Assistant-AfriGEO Secretariat

Remmy Kesis
GIS Analyst

Franklin Rono
Remote Sensing Officer

Benard Endesha
Biologist, Machine-learning Modeler

Yvonne Khaemba
ESA-HUB Policy Expert

Martin Nyoro
Geospatial Data officer

Job Waruingi
Regional Resource Hub Communications Coordinator

ACQUISITION OF DRONES

RCMRD received a multirotor and a hybrid drone. These two drones, delivered by Fahari Aviation, a partner of RCMRD, will be used for training purposes, aerial surveys, mapping, and research.

A group photo of RCMRD staff led by the Director Capacity Building and Training Mr Julius Gichohi, third right receiving the drones from Fahari Aviation team

GMES & AFRICA INTERNSHIP OPPORTUNITIES

RCMRD, under the GMES & Africa program, established an internship program that provided valuable opportunities for young people to gain practical experience in the field of earth observation. A total of nine (4 males and 5 females) interns were recruited for the program, providing them with a unique opportunity to enhance their skills in utilizing geospatial technologies, processing satellite imagery, and analyzing data for various applications. In addition, they supported the project and service areas, working towards the development of geospatial applications and services utilizing Earth Observation (EO) data and products.

A group photo interns during their welcoming day by the Director General. From the right: Mr Joseph Murage (GMES & Africa Project Manager), Denis Kiptoo (intern), Willy Sibomana (intern), Dr Emmanuel Nkurunziza (Director General), Mary Isabella Okoth (intern), and Topister Nanjala (intern)

RCMRD MAP COMPETITION 2023 EDITION

In an innovative initiative to promote the use of earth observation and raise awareness of geospatial data sharing geoportals and observatories to allow users to discover GIS datasets and creatively use them to develop innovative solutions, RCMRD launched a Map Competition. This initiative brought together various programs represented by different institutions under one umbrella, encouraging participants to creatively utilize GIS datasets and develop.

With a focus on Environmental and Biodiversity Conservation Efforts, participants were encouraged to harness the power of geospatial technology to develop innovative solutions addressing diverse topics such as forestry, protected areas, wildlife, wetlands, and marine conservation. Dompezodwa Nhlapho from Maseru, Lesotho, was the 2023 overall winner and won Euros 4,000 under the project Mapping Invasive Species in Lesotho Wetlands. Other winners were Frank Anderson from Dar es Salaam, Tanzania, who won (Euros 2,000) under the professional category: land theme; and Julius Ivan Ogwang from Kampala, Uganda, who won the professional category under the marine theme.
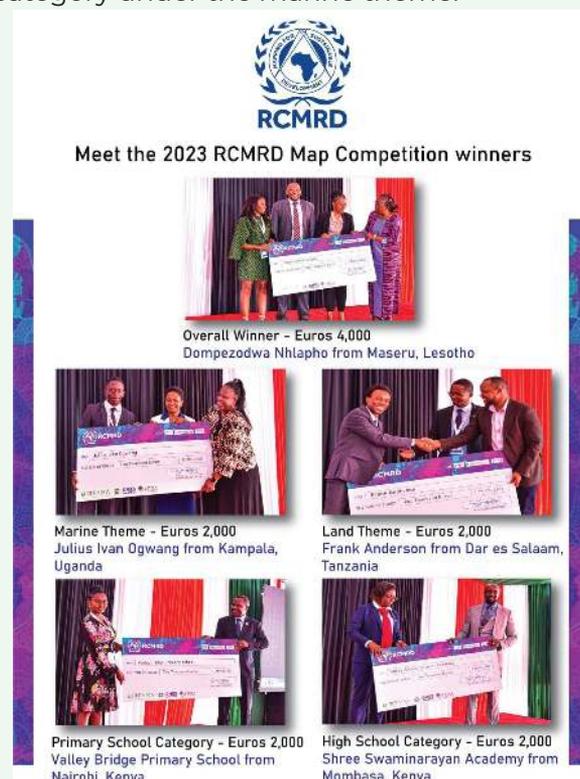
NOTABLE EVENTS IN 2023

1st GMES & Africa Consortia Heads Management meeting held on 27th February to 1st March 2023

RCMRD International Conference(RIC) 2023 was held on August 8–10, 2023. The theme of the conference was NEXT LEVEL:Space to Community

The opening of the DEA satellite office at the RCMRD Complex by the DEA Managing Director, Thembi Xaba (third from the left), took place on August 8, 2023

BIOPAMA held an all hands meeting on 18th-24th September, 2023,in Gland, Switzerland

African Geodetic Reference Frame (AFREF) Traning from 2nd -6th October 2023 at RCMRD,Nairobi,Kenya

RCMRD Map Competition 2023 winners' awarding ceremony took place in November 2023 at RCMRD, Kenya, officiated by the Cabinet Secretary of the Ministry of Lands, Public Works, Housing, and Urban Development, Hon. Alice Wahome

Inauguration of RCMRD Complex and RCTI hostels by the Cabinet Secretary, Ministry of Lands, Public Works, Housing, and Urban Development, Hon. Alice Wahome in November 2023 at RCMRD, Nairobi

The 57th RCMRD Governing Council Meeting attended by Principal Secretaries from our 20 member States held in November 13th -18th at RCMRD, Nairobi, Kenya

2024 EVENTS AT A GLANCE

22nd March 2024

13th-15th August, 2024

11th-18th November, 2024

RCMRD Governing Council and Conference of Ministers Meeting
Date: 11th-18th November, 2024
Venue - Zambia

These are wide rangeof Land Survey and Land Management courses you can choose from:

Course	Duration
Precision GNSS Surveying	3 weeks/ 2 Weeks
Laser Scanning and LiDAR Technology	3 weeks/ 2 Weeks
Remote Sensing for Land Surveying	3 weeks/ 2 Weeks
Surveying Project Management	3 weeks/ 2 Weeks
Land Surveying Ethics and Professional Practices	3 weeks/ 2 Weeks
BIM (Building Information Modeling) and Surveying	3 weeks/ 2 Weeks
Land Development and Subdivision Planning	3 weeks/ 2 Weeks
Land Information Systems	3 weeks/ 2 Weeks
Modern Land Surveying Equipments	3 weeks/ 2 Weeks

Course	Duration
Calibration of survey equipment such as Total stations, Levels, Theodolites and GPS	2 weeks full day
Service, Repair & Adjustment of Opti-Mechanical Surveying Instruments	2 weeks full day
GIS and Remote Sensing for Land Management:	3 weeks/ 2 Weeks
Land Management and Planning	3 weeks/ 2 Weeks
Surveying and Mapping for Infrastructure Projects	3 weeks/ 2 Weeks
Land Tenure and Land Rights	3 weeks/ 2 Weeks
Digital Land Surveying and Data Management	3 weeks/ 2 Weeks
Land Valuation and Appraisal	3 weeks/ 2 Weeks

These are wide range of GIS and Remote Sensing Courses you can choose from:

Course	Duration
Fundamentals of GIS	3 weeks/ 2 Weeks
Fundamentals of Remote Sensing	3 weeks/ 2 Weeks
Advanced GIS	3 weeks/ 2 Weeks
Advanced Remote Sensing	3 weeks/ 2 Weeks
Applied GIS and R.S in Health	3 weeks/ 2 Weeks
Applied GIS and R.S in Marketing	3 weeks/ 2 Weeks

Course	Duration
Applied GIS and R.S in Logistics	3 weeks/ 2 Weeks
Applied GIS and R.S in Monitoring and Evaluation	3 weeks/ 2 Weeks
Applied GIS and R.S in Hydrology	3 weeks/ 2 Weeks
Applied GIS and R.S in Forestry	3 weeks/ 2 Weeks
Applied GIS and R.S in Natural Resources	3 weeks/ 2 Weeks
Applied GIS and R.S in Environmental Impact Assessment	3 weeks/ 2 Weeks
Applied GIS and R.S in Tourism	3 weeks/ 2 Weeks
Applied GIS and R.S in Disaster Management	3 weeks/ 2 Weeks
Applied GIS and R.S in Urban/ Regional planning	3 weeks/ 2 Weeks
Applied GIS and R.S in Environmental Monitoring	3 weeks/ 2 Weeks
Applied GIS and R.S in Water resource Managemnt	3 weeks/ 2 Weeks
Applied GIS and R.S in Precise farming	3 weeks/ 2 Weeks
Applied GIS and R.S in Land administration	3 weeks/ 2 Weeks
Applied GIS and R.S in Crime mapping	3 weeks/ 2 Weeks
Applied GIS and R.S in Business	3 weeks/ 2 Weeks
Applied GIS and R.S in Transport planning	3 weeks/ 2 Weeks

Course	Duration
Applied GIS and R.S in Banking	3 weeks/ 2 Weeks
Applied GIS and R.S in disease control	3 weeks/ 2 Weeks
Applied GIS and R.S in ecology	3 weeks/ 2 Weeks
Applied GIS and R.S in Energy	3 weeks/ 2 Weeks
Applied GIS and R.S in Climate	3 weeks/ 2 Weeks
Applied GIS and R.S in Geostatistics	3 weeks/ 2 Weeks
Applied GIS and R.S in Geology	3 weeks/ 2 Weeks
Applied GIS and R.S in Groundwater	3 weeks/ 2 Weeks
Applied GIS and R.S in Land use planning	3 weeks/ 2 Weeks
Applied GIS and R.S in Real Estate	3 weeks/ 2 Weeks
Applied GIS and R.S in utilities	3 weeks/ 2 Weeks

Course	Duration
Applied GIS and R.S in Soil	3 weeks/ 2 Weeks
Applied GIS and R.S in Asset management and maintenance	3 weeks/ 2 Weeks
Applied GIS and R.S in Telecommunication Services	3 weeks/ 2 Weeks
Applied GIS and R.S in Mapping and navigation	3 weeks/ 2 Weeks
GIS programming using R or Python	3 weeks/ 2 Weeks
Google Earth engine	3 weeks/ 2 Weeks
Drone data processing	3 weeks/ 2 Weeks
Radar & Lidar Remote Sensing	3 weeks/ 2 Weeks
Digital Photogrammetric Mapping and Terrain Modeling	3 weeks/ 2 Weeks

**For more details Contact,
Email: rcti@rcmrd.org Tel: +254 0101777778**

MEMBER STATES
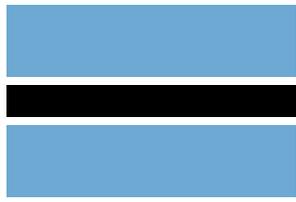
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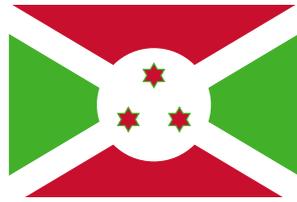
BURUNDI

COMOROS

ESWATINI

ETHIOPIA

LESOTHO
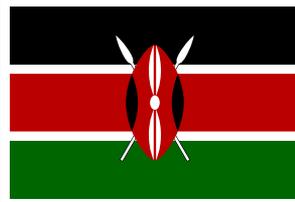
KENYA

MALAWI

MAURITIUS

NAMIBIA

RWANDA

SEYCHELLES
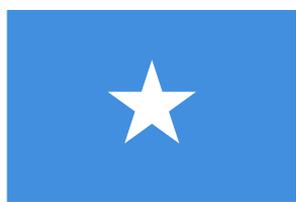
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SOUTH AFRICA
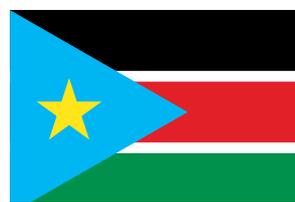
SOUTH SUDAN

SUDAN

TANZANIA

UGANDA
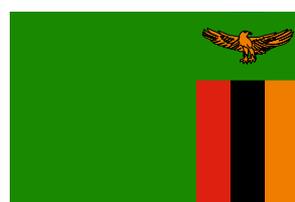
ZAMBIA

ZIMBABWE

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