



**Regional Centre for
Mapping of Resources
for Development**



ANNUAL REPORT 2020

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ACRONYMS

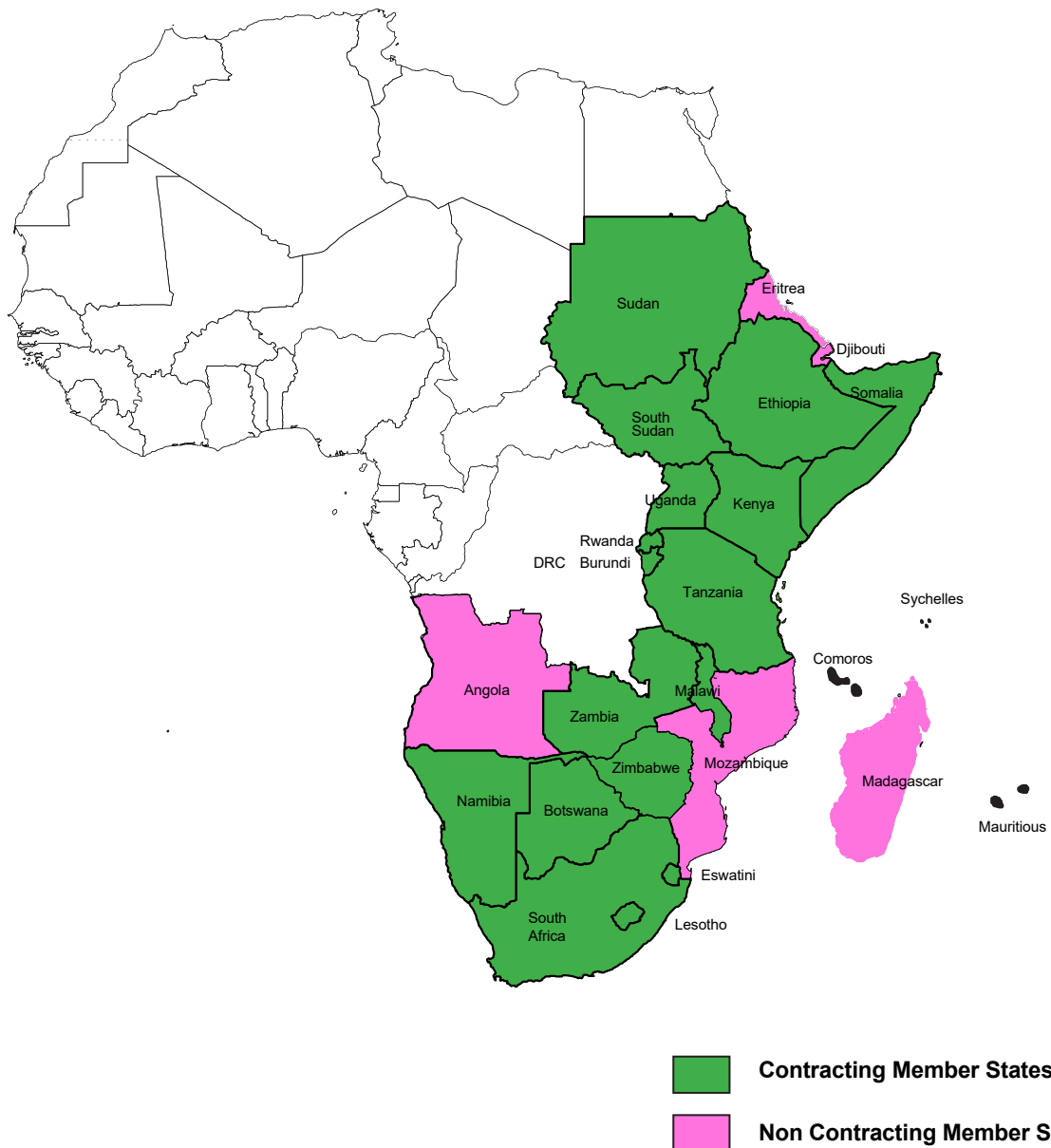
ACC	Africa Conservation Centre	ISUD	Integrated Strategic Urban Development Plan
ACP	African, Caribbean and Pacific	IUCN	International Union for Conservation of Nature
AFDB	African Development Bank	JRC	Joint Research Centre of the European Commission
AFRICA	African Framework for Research Innovation, Communities and Applications	KEBS	Kenya Bureau of Standards'
AfriGEO	The African Group on Earth Observations	KWCA	Kenya Wildlife Conservancies Association
AGRA	Alliance for a Green Revolution in Africa	LASAC	Land Satellite Remote Sensing Application Center
AGCOM	Agricultural Commercialization Project	LULC	Land Use Land Cover
AU	African Union	MODIS	Moderate Resolution Imaging Spectroradiometer
AUC	African Union Commission	MBPs	Megabits per second
ARD	Analysis Ready Data	MOH	Ministry of Health
AUDA	African Union Development Agency	MoLHUD	Ministry of Lands Housing and Urban Development
BIOPAMA	Biodiversity and Protected Areas Management	MRV	Measurement Reporting Verification
CCDC	Continuous Change Detection and Classification	NCA	Natural Capital Accounting
CCTV	Closed-circuit Television	NDMA	National Drought Management Authority
CCROs	Certificates of Customary Rights of Occupancy	NELGA	Network of Excellence on Land Governance in Africa
CI	Conservation International	NEPAD	The New Partnership for Africa's Development
CIESIN	Center for International Earth Science Information Network	OAU	Organization of African Unity
CSE	Centre de Suivi Ecologique	RCMRD	Regional Centre for Mapping of Resources for Development
CSA	Climate Smart Agriculture	RCTI	Regional Centre Training Institute RIC Regional Implementation Centre
CTCN	Centre/Climate Technology Centre and Network	RRH	Regional Resource Hub RRIS The Reference Information Systems
C19RC	COVID-19 Response Committee	R&D	Research and Development
DEA	Digital Earth Africa	RHEAS	Regional Hydrologic Extremes Assessment System
EF5	Ensemble Framework for Flash Flood Forecasting	QC	Quality Control
EO	Earth observations	QMS	Quality Management System
ESIPPS	Environmental Surveys, Information, Planning and Policy Systems	SANSA	South African National Space Agency
ESRI	Environmental Systems Research Institute	SAR	The Synthetic Aperture Radar
EU	European Union	SDG	Sustainable Development Goals, especially
GC	Governing Council	SEE	Sustainable Echo Engineering Ltd
GEE	Global Earthquake Explorer	SERVIR-E&SA SERVIR	Eastern and Southern Africa
GEO	Group on Earth Observations	SGS	Société Générale de Surveillance'
GeoGLOWS	Group on Earth Observations - Global Water Security	SIS	Soil Information System
GESI	Gender Equality and Social Inclusion	SMFM	Satellite Monitoring for Forest Management
GHACOF	Greater Horn of Africa Climate Outlook Forum	TAG	Technical Advisory Group
GIS	Geographical Information System	TAHMO	Trans-African Hydro-Meteorological Observatory
GMESand Africa	Global Monitoring for Environment and Security and Africa	TOR	Terms of Reference
GNSS	Global Navigation Satellite System	TVET	Technical and Vocational Education and Training
GPS	Global Positioning System	UAV	Unmanned Aerial vehicle
GRI	Global Reporting Initiative	UNDP	United Nations Development Programme
HRSL	High Resolution Settlement Layer	UNECA	United Nations Economic Commission for Africa
ICDL	International Computer Driving License	UNICEF	United Nations Children's Fund
ICIMOD	Integrated Mountain Development	UPD	Urban Planning and Design Branch
ICRAF	International Centre for Research in Agroforestry	USAID	United States Agency for International Development
ICT	Information Communication Technology	WARIDI	Water Resources Integration Development Initiative
IGAD	Intergovernmental Authority on Development	WFP	World Food Program
IO	Intergovernmental Oceanographic Commission	WG	Working Group
IPMS	Integrated Projects Management System	WMO	World Meteorology Organization
IP	Internet Protocol	WOfS	Water Observations from Space
ISO	International Organization for Standardization	VLUPs	Village Land Use Plans

ACKNOWLEDGMENT

The RCMRD Leadership is pleased to present the Centre's Annual Report for 2020 to our Partners, Members States and Stakeholders. The Centre had another strong year in 2020 despite the challenges and new working strategies caused by the COVID-19 pandemic.

The Centre's 2020's success would not be possible without the support, trust, and commitment from all our Partners, Members States, and other Stakeholders.

The Leadership team takes this opportunity to thank each of our partners, Members States, and other Stakeholders for your endless support, and we work each day to ensure the Centre provides enhanced products and services. The leadership also appreciates the staff members for their unwavering dedication, diligence, and hard work, especially during this challenging period to ensure the Centre delivered.





THE CHAIRPERSON'S NOTE

I am privileged to have had the opportunity to chair the RCMRD Governing Council meeting in the year 2020, courtesy of my country's membership to RCMRD, and as the Permanent Secretary in the Ministry for Land Management, Water and Sanitation Services, in the Republic of Botswana. My country has been a proud member of RCMRD since April 13, 1989, during which Botswana has provided unwavering support to the Centre. The Centre has also provided important services not only to Botswana, but also to many other member States, mainly in the fields of surveying instrument calibration and maintenance, geospatial product development and training.

I am pleased to note that under my responsibility as the chairperson of the GC in the year 2020, the Centre made remarkable strides in the implementation of its work programme, during a rather difficult year. For the first time in the history of the Centre, the Governing Council transacted its business virtually, because members could not meet physically due to the COVID-19 pandemic. Despite this limitation, I am happy to affirm that as highlighted in this annual report, the Centre's profile was significantly improved, and this can be attested to by the ability of the Centre to attract international partners to support its programmes and services. Unlike other firms that were adversely affected by lowered productivity and thus had to lay-off staff, the Centre's management instituted prudent measures to enable it to retain staff at productive levels. I also take cognizance of the fact that the Centre improved its infrastructure significantly, and the GC commended the efforts to put up an ultra-modern office building, which will enable the institution to utilize the old office buildings as training facilities. I am confident that this strategic move will return dividends to member States in the near future. The GC also noted that the RCMRD finances and assets were prudently managed during the year, and this was evidenced by the clear audit reports presented to the GC. I also note with pride the strides that the institution is making towards growing its competencies as the premier institution for training and capacity development in geo-information and allied technologies in member States.

Honorable member States, while it is impressive to note that the Centre made remarkable achievements in a fairly challenging year, allow me also to remind you that your support to the institution is invaluable. I commend those member States who continued to utilize the Centre's services, honor their annual subscriptions and also provide feedback to the management to improve the Centre's operations. As we get into the year 2021, I am happy to note that the GC approved a work programme for the Centre, inline with the 4-year strategic plan approved by the Conference of Ministers. I request all member States and partners to extend their unwavering support to the Centre to achieve its goals for 2021. I am confident that the planned activities will bring benefits to our people in the respective member States. I too commend the management of RCMRD for ensuring that the Staff were safe from COVID-19. I wish you all a safe and productive 2021, and hope to hear of the achievements of the Centre and your respective countries in the next GC meeting.

Ms. Bonolo Elizabeth Khumotaka
Chairperson RCMRD Governing Council, 2020.



FROM THE DIRECTOR GENERAL'S DESK

In accordance with Articles VI, Sub Article C of the Agreement establishing the Regional Centre for Mapping of Resources for Development (the "Centre") and on behalf of the RCMRD Management, I have the honor and privilege to submit to Members of the Governing Council and partners, the Annual Report for the Centre for the period from 1st January to 31st December 2020. The year 2020 took us to the mid-point of implementation of the RCMRD 2019-2022 Strategic Plan that was approved by the Conference of Ministers in November 2018. The specific activities to be undertaken during the year in question were detailed in the 2020 Work Programme and Budget that was approved by the Governing Council in Nairobi in November 2019.

The year 2020 was unique, primarily because of the COVID-19 pandemic. Allow me to highlight some key takeaways on how the pandemic affected RCMRD operations. First, RCMRD was forced to cut back on a number of planned activities due to travel restrictions imposed by the Kenya Government, other regional governments and internationally. Second, following lockdowns imposed by the Kenya Government in early 2020, the Centre devised a work-from-home policy, which encouraged many staff members to work from home and coordinate with line managers through tele-working. Staff members with duties that could be performed through tele-working were requested to operate from the office. Third, the Centre implemented COVID-19 safety protocols (social distancing, hand sanitizing and tele-working) announced by the Ministry of Health in Kenya. Fourth, the Centre created a COVID-19 Response Committee (C19RC) whose mandate was to analyze work related safety information and provide recommendations to management on staff safety. All this was done with a view to ensuring that RCMRD staff remained safe from infections, and also created a safe environment within the office premises, without adversely affecting operations. I am happy to note that within the year 2020, the Centre did not record infections of COVID-19 among staff.

Irrespective of the tough working conditions in the year 2020, I am proud to note that through tele-working, the Centre made significant adaptations and innovations which led to achievements of the revised targets for the year. This report shares the progress made in the implementation the 2020 work programme, which reflects activities alongside the key pillars in the four-year strategic plan, a range of projects, training and collaborations with partners. For instance, in addition to implementing a tele-working policy, the Centre also innovated a virtual training platform which ensured that training could continue to be offered to member States. The Centre also provided appropriate digital connectivity tools for virtual linkages to facilitate meetings among staff and with partners.

While we recognize the challenging times that partners and member States have endured and continue to endure during this difficult time, I remain positive that the Management of the Centre will do everything possible to ensure that RCMRD provides valuable services to member States. The achievements made in 2020 were largely possible because of the continued support by member States and partners.

Honourable Members of the Governing Council, please accept the assurances of my highest consideration and esteem.

**Dr. Emmanuel Nkurunziza,
Director General, RCMRD.**

EXECUTIVE SUMMARY

This report exhibits the Centre's Financial Year 2020 achievements. The achievements were realized through the implementation of the 2020 Annual Workplan activities in line with the six key strategic objectives in the 2019-2022 Strategic Plan. The Centre's profile was enhanced through continuous member States and other stakeholder engagements, social media presence, press releases, newsletters, publication of peer-reviewed scientific papers, and production of visibility materials, installation of visible signages in the new office complex and gate. The Centre continued to engage the existing partners and joined new partnerships with the following : Africa Conservation Centre (ACC), African Development Bank (AFDB), Airbus, Alliance for a Green Revolution in Africa (AGRA), Development of Land Help Desk In 10 Selected Countries, ESRI Global, European Union (EU) Joint Research Centre of the European Commission (JRC), Horizon 2020 programme of the European Union, Integrated Mountain Development (ICIMOD), International Union for Conservation of Nature (IUCN), Kenyatta University, Land Satellite Remote Sensing Application, Leica Geosystems, Ministry of Natural Resources of PR China, National Aeronautics and Space Administration (NASA), National Drought Management Authority (NDMA), Olsuswa Energy Limited, Luc Hoffmann Foundation, Pan Africa Geo-information, Sustainable Echo Engineering Ltd (SEE), United Nations Children's Fund (UNICEF) LTAS, United Nations Development Programme (UNDP), United States Agency for International Development (USAID), World Agroforestry Centre/Climate Technology Centre and Network (ICRAF/CTCN), World Bank , and World Food Programme (WFP).

The Centre conducted the review of the organizational structure to determine the effectiveness of the current organizational structure. The recruitment of staff in some of the vacant positions was done. Centre Staff continued to improve and build capacity through enrollment in short professional courses and academic studies. The Centre formed an internal COVID-19 committee to spearhead workplace response to the pandemic. A mid-term review of the implementation of the Strategic Plan 2019-2022 was undertaken to provide member States, stakeholders and RCMRD Management an independent assessment of performance on the implementation of the plan, document lessons learnt and provide recommendations of what needed to be improved during the next two years.

To ensure financial stability, the Centre implemented various strategies to supplement income besides the member States' contributions. These include; diversification of wider partnerships through collaboration, investment on surplus cash, actualizing the capital development fund, financial controls and continuous proposal writing for funding purposes.

To ensure the Centre's infrastructure was adequate and responsive to meet its mandate effectively, the new RCMRD complex construction was completed and is currently being used as Office Space. The Centre's ICT infrastructure was improved by upgrading the internet service, installation of a high-capacity Server, CCTV network for video surveillance, internet protocol (IP) Phones and video conferencing equipment. Further, 190 Meters Baseline for calibration and servicing of survey equipment was installed in the new RCMRD Complex.

The Centre conducted various customized training events with over 600 participants from member States and other stakeholders to build their capacity in geo-information and allied technologies. An online e-learning platform was developed to support professional, RCTI and customized project training. The Ethiopia Capacity Building project was successfully completed. The RCTI continued to offer both academic and professional courses with a total of 554 students and 106 participants for professional courses, representing a 12% growth in student enrollment.

The Centre implemented various projects in member States and other countries focusing on the following thematic areas: Agriculture and Food Security, Weather and Climate Change Impacts, Ecosystems Management and Natural Resource Monitoring, Land Use Land Cover Change, Land Governance and Urban Development, Water and Water Disasters and Geo-spatial Information Technologies support. Further, the Centre supported calibration and servicing of survey instruments in Kenya and Zimbabwe, with a total of 104 and 20 instruments serviced in the government and private firms respectively.

Under knowledge management, the Centre undertook to improve project bidding processes and project management by developing an Integrated Projects Management System (IPMS). In addition, some observatories and repositories were maintained and developed which included: The Natural Resource Geoportal Interactive Maps and Atlases, the GMES website and Geoportal, the BIOPAMA Regional Resource Hub, the AGRA project Geoportal, the Network of Excellence on Land Governance in Africa Web Portal and Data Repository, the Land Help Desk platform in conjunction with AUDA-NEPAD's Land Governance Programme and geoportal for hosting conservation data. A COVID-19 dashboard to monitor and track the spread of coronavirus in the 20-member States was also designed.

ABOUT RCMRD

The Regional Centre for Mapping of Resources for Development (RCMRD) was established in Nairobi – Kenya in 1975 under the auspices of the United Nations Economic Commission for Africa (UNECA) and the then Organization of African Unity (OAU), today African Union (AU). RCMRD is an inter-governmental organization and currently has 20 Contracting Member States in the Eastern and Southern Africa Regions: Botswana, Burundi, Comoros, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Somali, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia and Zimbabwe. The countries affiliated to the Centre are Angola, Mozambique, Madagascar, Djibouti, Eritrea and the Democratic Republic of Congo.

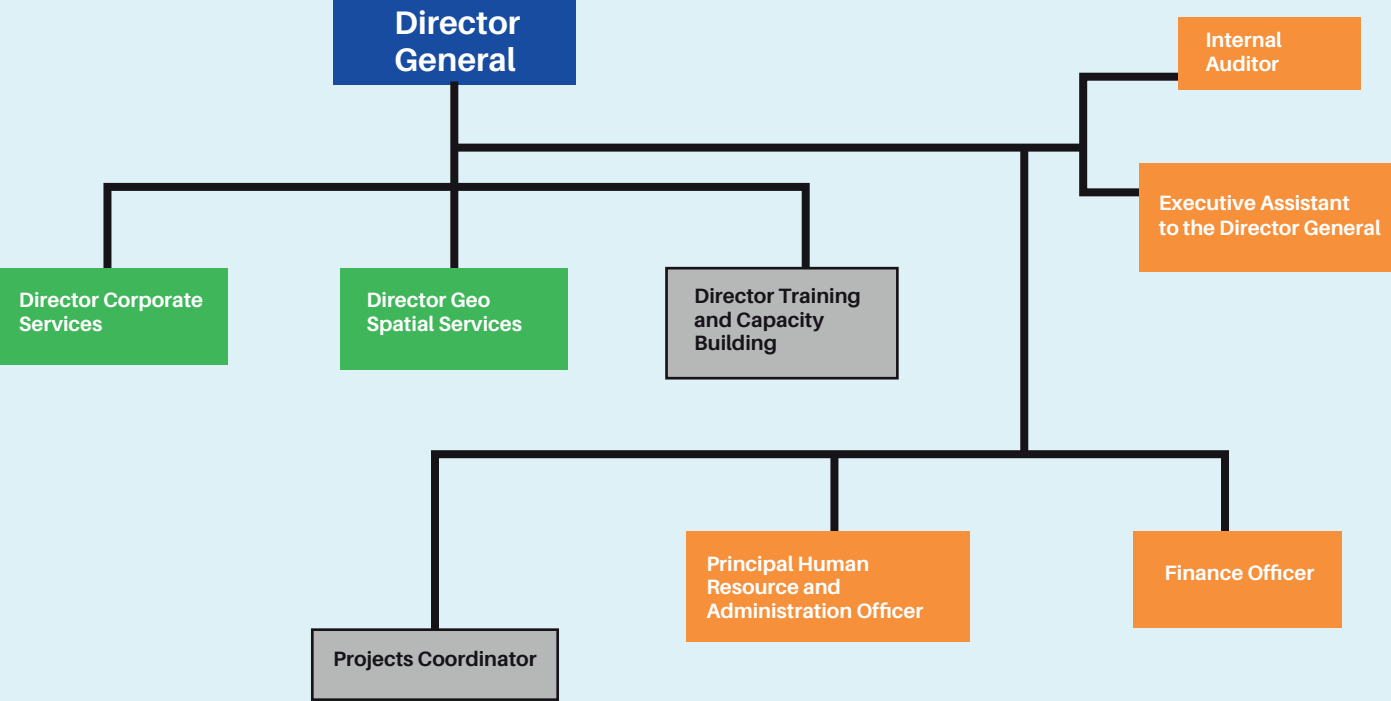


RCMRD 2019 – 2022 STRATEGIC PLAN

The year 2020 marked the second year of the implementation of the 2019-2022 Strategic Plan whose mission is “To Strengthen the member States and our stakeholder’s Capacity through Generation, Application and Dissemination of Geo-information and Allied Technologies for sustainable development.” The Strategic Plan clearly identified measures to implement the Centre’s core functions and objectives. It provides direction and focus to strategically play a central role in the development and use of geo-information for sustainable development and promoting the uplifting of the standards of living of the population in the member States and beyond. The implementation of the Strategic Plan will be rolled-out through Annual Work Plans.

The implementation of the 2020 Annual Work Plan was executed through the Centre’s structure along key strategic objectives in the strategic plan: RCMRD Profile, which enhances the RCMRD profile through member States and stakeholder engagement; Human Capital which aspires to have a competent and motivated workforce); Financial Sustainability which enables the Centre to be a financially sustainable & stable organisation); Infrastructure which ensures the Centre’s infrastructure is adequate and responsive to meet its mandate effectively and efficiently; Products and Services which strengthens the capacity of our member States and other stakeholders in geo-information and allied technologies, undertakes programs that positively impact our member States and other stakeholders; and Knowledge Management which enhances RCMRD’s capability in knowledge management.

RCMRD GOVERNANCE AND MANAGEMENT

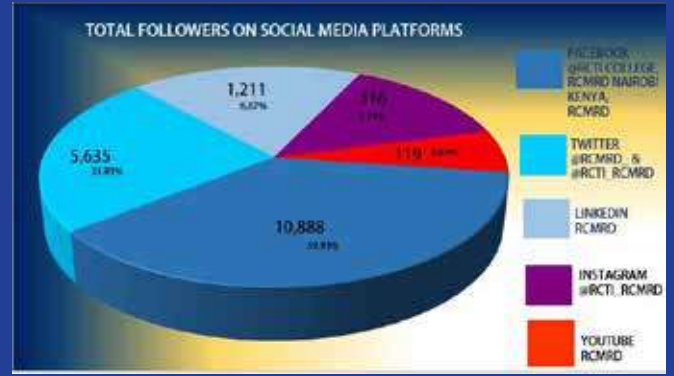


RCMRD'S PERFORMANCE FOR YEAR 2020

RAISING THE RCMRD PROFILE

Communication and Outreach Highlights

The communications team continued to engage in the communications and outreach activities to enhance the visibility of the Centre's work, ensure effective dissemination, and mainstream good communication practices. The team takes the lead in coordinating and spearheading outreach to the stakeholders. Various approaches were used to increase the Centre's visibility: through online outreach and event coverage, social media, audiovisual productions, mainstream media and, production and distribution of branded material and publications. The Centre's website was continually updated to reflect the up-to-date information which informed the stakeholders and member States of the upcoming as well as ongoing activities and events at the Centre: new partnerships and collaborations, upcoming training and conferences, new products and services, tender announcements, career opportunities/vacant positions section and internships.



while video clips are posted on YouTube.

Efforts to ensure that information on the various products and services and regular updates on thematic issues reach the stakeholders, member States, and the public, over 100 articles were created and posted on the Centre's website and the relevant projects' websites. One Newsletter was also published. These articles can be accessed at www.rcmr.org/.

Seven (7) audiovisual productions were produced and posted on the Centre's YouTube channel. These informed the stakeholders of the existing development challenges in the region, the needs identified by the Centre through needs assessments, the people and institutions, the interventions/solutions, the anticipated impact of the solution provided, and a follow-up on the communities and the government entities engaged. A semi-documentary piece was also done and shared with the Governing Council, to showcase the new office complex. To maintain its relationship with the media, the Centre issued six (6) media press releases. These informed media of the Centre's events and projects. The press release explained more about the partnerships and the benefits to be derived from using earth observation in sustainable development. To mark global events relevant to the Centre and its staff, the Centre designed posters, banners, and video clips to join the world in celebrating the events such as world environment day, world clean-up day, and global handwashing day.



In this reporting period, the Centre recorded enhanced social media presence, including Flickr, Facebook, LinkedIn, Twitter, and YouTube. Centre regularly tweets news, publications, and information on events and products and services produced, which have increasingly been picked up and shared by stakeholders. Centre uses Flickr as the main image repository for all major events at the Centre



Stakeholder Engagement

To improve the Center's products and services delivery, the Centre continued to conduct needs assessments in the Member States, to understand the needs of the member States and stakeholders. The Centre, through the office of the Surveyor General in various Member states, continued to conduct needs assessments to guide the development of services, which is in line with the service planning approach used by the Centre in Service development. The benefits of this approach include Co-development, reduced duplication of efforts, and enhanced collaboration. The assessments have been conducted in seven countries since 2016 and enacted in the 2019-2022 strategic plan. The thematic areas of focus include Land Administration and Management, Urban Planning, Weather and Climate, Agriculture and Food security, water and water-related disasters. More plans are in place to finalize the assessments in the member states. The Center is also engaging Digital Earth Africa to co-design and find solutions to various developmental issues within Africa and beyond.



RCMRD Director General Dr. Emmanuel Nkurunziza with (Right) H.E. Dr. Pindi H. Chana - High Commissioner of the United Republic of Tanzania to the Republic of Kenya, who paid a courtesy call to RCMRD to familiarise herself with activities of the Centre

Partnerships and Alliances

#	Partnership and Alliances
1.	Africa Conservation Centre (ACC)
2.	African Development Bank (AFDB)
3.	AfriGEO – <i>AfriGEO Secretariat</i>
4.	Airbus – <i>High resolution data</i>
5.	Alliance for a Green Revolution in Africa (AGRA) – <i>Strengthening Agri-Foods Data Systems to inform Food Security Policies & Trade in Sub-Saharan Africa</i>
6.	AUDA-NEPAD – <i>Development of Land Help Desk In 10 Selected Countries</i>
7.	Digital Earth Africa
8.	ESRI Global – <i>MoU - providing a framework for a cooperative business relationship in regard to geospatial capacity building within RCMRD's member States</i>
9.	European Commission – <i>GMES and Africa</i>
10.	European Union (EU), Joint Research Centre of the European Commission (JRC), and International Union for Conservation of Nature (IUCN) – <i>Regional Biodiversity Knowledge Hub Launched in Eastern and Southern Africa - BIOPAMA programme</i>
11.	Food and Agriculture Organization (FAO) - United Nations – <i>Development of Natural Resource Geoportal and Interactive Maps and Atlases.</i>
12.	Horizon 2020 programme of the European Union – <i>Soils4Africa Project</i>
13.	Integrated Mountain Development (ICIMOD) and Sustainable Echo Engineering Ltd (SEE) – <i>Community Based Flood Early Warning System (CBFEWS) Project in Malawi</i>
14.	Kenyatta University
15.	Land Satellite Remote Sensing Application
16.	Leica Geosystems
17.	Luc Hoffmann Foundation
18.	Ministry of Natural Resources of PR China
19.	United Nations Development Programme (UNDP), National Drought Management Authority (NDMA)– <i>Hazard Risk Mapping and Hazard Atlases Preparation, Flood Risk Assessment and Modelling for Tana and Sabaki Rivers</i>
20.	Olsuswa Energy Limited
21.	Pan Africa Geo-information
22.	United Nations Children's Fund (UNICEF) LTAS
23.	United Nations Development Programme (UNDP) – <i>Community Based Flood Early Warning System (CBFEWS) Project in Malawi</i>
24.	United Nations Environment Program (UNEP) – <i>Sustainable Water and Air Quality Monitoring Systems in Africa</i>
25.	UN-Habitat – <i>Supply of High-Resolution Satellite Images and Creation of GIS Base Map for Moyale Town, Kenya</i>
26.	United States Agency for International Development (USAID) and National Aeronautics and Space Administration (NASA) – <i>SERVIR Eastern and Southern Africa Project</i>
27.	World Agroforestry Centre/Climate Technology Centre and Network (ICRAF/CTCN)
28.	World Bank
29.	World Food Programme (WFP)
30.	Malawi AGCOM – <i>Process Monitoring of Pilot Implementation of The New Land Laws in Malawi</i>



RCMRD signed an MOU with the World Food Programme (WFP)

Integrating Gender into Centre's Activities

Globally, many programs and institutions, under the United Nations SDG-5 on Gender Equality, recognize that gender equality is not only a fundamental human right but a necessary foundation for a peaceful, prosperous and sustainable world. In the past, RCMRD has been actively involved in activities and programs that work towards gender integration. The Centre has made deliberate efforts to ensure the gender component is effectively integrated at the Centre. To solidify these efforts, the Centre, with support from the SERVIR Project, U.S. Agency for International Development (USAID) and National Aeronautics and Space Administration (NASA), started the gender mainstreaming process in all the Centre's activities. Different actions have been ongoing to ensure this policy is active at the Centre; the development of the Centre's Gender Strategy, which is at its initial stages, and the recruitment process of a full-time Gender Expert at the Centre has already begun. Other efforts include hiring a Gender consultant whose main task was to conduct capacity-building activities for staff members, equip staff members on the concepts of gender, gender integration in the different departments, and support the development of the Gender Strategy.

Additional activities that Centre has been involved in to support gender activities include: (i) through AfriGEO, the Centre was primarily tasked with the development of GEO's statement on GEO Equality Diversity and Inclusion (EDI), development of an implementation strategy for EDI and tools for tracking progress, (ii) the Centre has been actively participating in the quarterly virtual meetings on "Women in SERVIR" to discuss how gender is implemented in other regions and also empower women in the SERVIR network and other topics such as nexus of gender inequality, political fragility and climate change, (iii) the Centre made contributions to DE Africa Gender Equality Diversity and Social Inclusion (GEDSI) strategy by participating in several meetings held within the year, with GeoScience Australia and Women in GIS Kenya, (iv) the Centre participated in an IUCN agent Webinar on "Gender and the environment" and GEDSI workshop by Agrilinks that was looking at "Women and Land Governance issues in Agriculture sector", (v) the Centre participated in the Women in Science (WiSci) Girls' STEAM Camps; an elite opportunity for secondary school girls from around the world to dive into STEAM (Science, Technology, Engineering, Arts & Design, Mathematics) subjects alongside their peers and develop their leadership skills in a unique cross-cultural environment, and (vi) the Centre collaborated with University of Huntsville Alabama, Women in GIS Kenya and University of Makerere on a gender proposal (awaiting feedback) made to the Belmont forum on "Women Assessing Transboundary Environmental Responses to Support Sustainable Fisheries in Lake Victoria."

COVID-19 Response

The Centre established a COVID-19 response mechanism by creating a COVID-19 Response Committee (C19RC), whose membership was drawn from various sections at the Center, with a mandate to spearhead coordinated workplace response to the pandemic. The Committee's main task was to strategize and advise Management on preparedness and response to the pandemic by providing guidelines on how staff would operate. To reduce congestion and infection risk, the C19RC recommended guidelines for teleworking, where the staff members working from home would ensure the FY2020 targets were achieved, and where needed, implement a shift system for those who had to be physically present at the office.



MILESTONES UNDER HUMAN CAPITAL DEVELOPMENT

The Centre managed to enhance institutional capacity and competence in this reporting period. A review of the Organization Structure was undertaken, which involved: determining the effectiveness of the current structure, updating job descriptions, creating new sections and positions, reviewing job titles, outsourcing options, and overall organizational development and improvement. The review results were presented to the Governing Council (GC) for approval. The GC approved the implementation of the findings. Further, the Centre managed to fill in some vacant positions in the different departments and sections. COVID-19 posed some challenges that resulted in rescheduling of some recruitment processes of the remaining vacant positions. In addition, the Centre continued implementing the Performance Management System for staff, to ensure that the institution maintained an efficient and motivated staff.

The Centre promotes staff capacity building by providing a conducive environment that allows staff members to access resources and experiences that enhance and build their relevant skills, experiences, and knowledge. Such usually results in improved staff performance. This process also guarantees the production of quality products and services for stakeholders. Despite the COVID-19 restrictions, the staff members managed to undertake online courses in various professional development courses, and others continued with their academic training programs. The professional development courses that staff members trained on include: the GMES Project Land Productivity training (11 staff trained), the Wind Erosion Modelling training (nine staff trained), the Wetlands Vulnerability Analysis training (ten staff trained), and the Socio-economic training (nine staff trained), GIS Training (one staff trained), the AGRA Project training (four staff trained). The Academic programs included: one staff member is pursuing a Ph.D. program in Environmental Studies at the University Boulder (USA), four staff members continued with their Master's program in the various Universities, one staff member continued their studies on Certified Procurement, and Supply Professional of Kenya program and other staff member continued with self-sponsored training programs.



The Centre reviewed the staff medical insurance policy to include and improve the following covers: improve the last expense cover and maternity cover, and addition of the COVID-19 Cover in the 2021 medical insurance policy cover. Additionally, the Cover enhanced some of the previous general benefits. The Centre successfully reviewed the management of the Staff Provident Scheme and agreed to have the Funds managed by an insurance company as a third party in compliance with audit requirements.



CENTRE'S FINANCIAL MANAGEMENT, APPROACH AND SUSTAINABILITY

Investment

The Finance Section continued to take advantage of the favorable interest rates in the market and continued investing the surplus cash in secure fixed deposits. The newly constructed RCMRD Complex will provide alternative investment options through lease of office space and conferencing facilities. The freed-up space in the old buildings will be used as a Training Centre and facilitate in generation of more income. The implementation of the first phase of the RCMRD master plan started in August 2018 with the construction of the RCMRD Office Complex, and has been completed and is currently being used as office space. A new masterplan to develop hostels and administration block was prepared and approved by the Governing Council. The intention is to improve the students' accommodation and raise additional funds for the institution through the hostels. The core mandate of the institution is capacity building in the geoinformation related sciences and the expansion of infrastructure in the Capacity Development Department will go a long way into ensuring that RCMRD is sustainable in the future. Despite the challenges experienced in the year, RCMRD was able to control its recurrent expenditure and maintain the work force thus the wage bill during the year. As such a significant profit as well as cash flows were reported in the year.

Procedures and Documentation

For stronger financial and accounting controls and in line with ISO requirements, the Finance Section has reviewed the finance rules and regulations. This will improve the overall controls in the Centre and ensure consistency by avoiding conflicts in the system and operations. In a bid to improve the procurement process, the Finance Section through the Internal Tender Committee of the Centre evaluated the prequalified suppliers of the period 2019-2020 financial years in order to establish a long-term relationship thus improving efficiency. Further, the procurement procedures were revised and improved so as to ensure that products, services and works supplied to the Centre fully conformed to the requirements and that a mutually beneficial customer-supplier relation existed.

Asset Management

The Finance Section continuously maintained the assets of the Centre in a fixed asset register. The Centre acquired new assets for the new building and the Finance Division tagged and updated them in the fixed assets register. Fully depreciated and obsolete assets were sold. The fixed assets register was updated with information collected during the asset's verification exercise.

Court Case for Former Employees

On 21st February 2020, the employment and labor relations court at Nairobi made a judgement on the court case by the former employees that the Claimants were all paid their full terminal benefits with the exception of interest on provident fund. The pending payments were done by close of year.

Issuance of Invoices and Statements to the member States

The Finance Section ensured timely issuance of invoices and statements to the member States. These were issued every quarter. This was a means of reminding the member States of the need to honor their membership contributions in order to enable the Centre offer services to them and run its daily operations.

External Audit of the Financial Statements

The Finance Section has provided to the external Auditors all the records, information and explanations necessary in the preparation and auditing of the Financial Statements for the year ended 31st December 2019. The external Auditor confirmed that the financial statements gave a true and fair view of the financial position of the Centre as at 31st December 2019. The external Auditor gave an unqualified opinion. The recommendations given by the external auditor after the audit of the Financial Statements for the year ended 31st December 2019 were fully implemented.

INFRASTRUCTURE DEVELOPMENT

To ensure the Centre's infrastructure is adequate and responsive to meet its mandate effectively, the new RCMRD complex construction was completed together with a water borehole, perimeter wall and a modern security gate. Other attendant infrastructure includes a well paved access road lined with solar powered lighting; increased car parking space, extension of the perimeter wall both at entrance and back, powerhouse with transformer and standby generator to support both current and future developments, solar power generation, huge water storage facilities (underground and overhead). In addition, modern interior design and procurement of full furnishing was completed. The Centre's ICT infrastructure was improved by upgrading the internet service from a bandwidth of 30 to 70MBPs, installation of a high-capacity Server, CCTV network for video surveillance, internet protocol (IP) Phones and video conferencing equipment. An online e-learning platform was developed to support professional, RCTI and customized project training. Further, 190 Meters Baseline for calibration and servicing of survey equipment was installed in the new RCMRD Complex.

THE NEW RCMRD COMPLEX

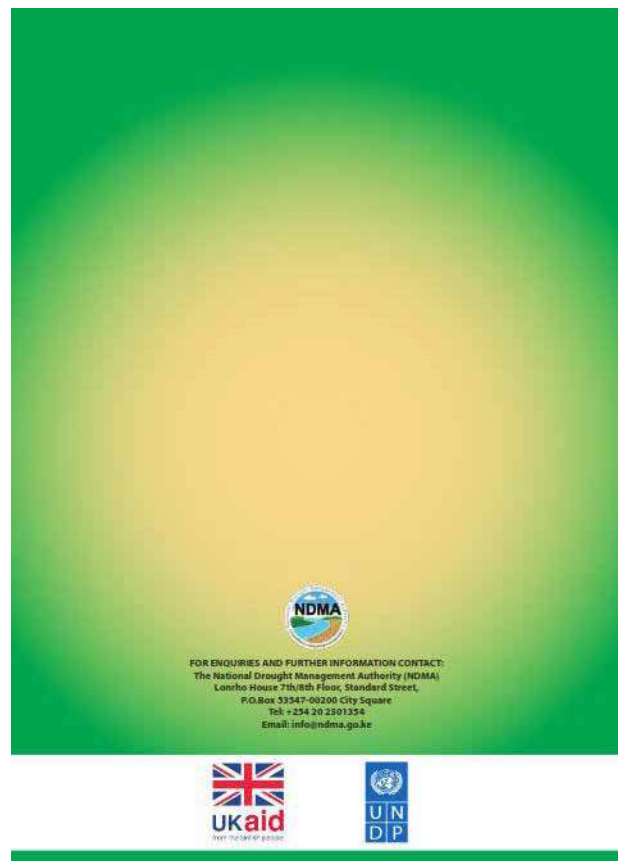
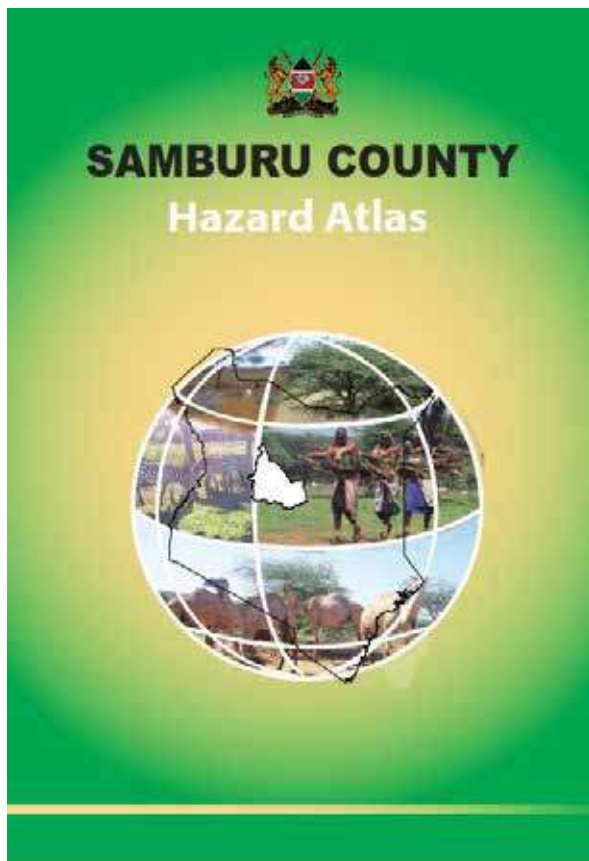


PROVISION OF PRODUCT AND SERVICES TO MEMBER STATES

Hazard Risk Mapping and Hazard Atlases Preparation

The Hazard Atlases mapping project was implemented in Kenya for Samburu and Isiolo counties as agreed with the client, the National Drought Management Authority (NDMA), and the United Nations Development Programme (UNDP). The project covered all the hazards occurring in the counties, specifically drought, floods, land/environmental degradation, diseases (human, livestock, crop), human resources-based conflicts, human and wildlife conflicts, and many others. The background information of the dataset of each map included: baseline physical and socio-economic features such as roads, rivers, towns, and administrative boundaries. The geoprocessing of the data was done to analyze access to the basic services such as clean water, schools, health facilities, main roads, veterinary services, and others. The Hazard Atlases have detailed findings and presentations on the vulnerability of each county which includes: exposure, sensitivity, and adaptive capacity. The main beneficiaries of the project are end users/local communities, the government, NGOs, academia, and research institutes. Due to the high demand by users, there was a request to reprint Turkana, Tana River, Baringo, Garissa, Kilifi, and Kwale atlases. The six atlases were reprinted, incorporated a few changes, and submitted to NDMA and UNDP.

As part of the capacity-building plan, more than 110 county officers were trained on the application of geoinformation technology for hazard risk mapping. The training mainly focused on hazard hotspots identification, hazard maps updating, and developing database and mitigation practices. Further, a project proposal was developed for the county of Wajir with support from WFP and Elgeyo Marakwet, and West Pokot with support from NDMA/UNDP. Currently, the Centre is developing the additional Hazard Atlases. All the soft copies and relevant data of the Hazard Atlases can be accessed through the Centre's geoportal.



Flood Risk Assessment and Modelling for Tana and Sabaki Rivers

The project on Flood Risk Assessment was conducted for the Tana and Sabaki Rivers in Kenya in collaboration with the UNDP and NDMA Kenya. The project covered areas along the two rivers in Garissa, Tana River and Kilifi counties, Kenya. The objective was to assess the flood risks impact and developing hydrological model for the flood zones of the two rivers. For that purpose, all the socio-economic infrastructures exposed to the risk such croplands, pastoral areas, settlements, roads, schools, forest, health services, veterinary services and others were identified and extracted from high-resolution satellite images and mapped accordingly. In addition, buffer areas within 10Km left and right of the rivers were considered as potentially exposed to flood risks. Different types of data processing analysis and modelling took place using geoinformation techniques and hydrological tools. The model developed was found to be practically applicable to predict the flood risk for the future. The output of the study is presented in such a way that the local community, planners, decision makers and researchers to use in national as well as local level. The final reports and other deliverables were submitted to the client.

Feasibility on Remote Sensing and Photogrammetry Capacity Development in Botswana

The project on the 'Feasibility Analysis of the Remote Sensing and Photogrammetry Capacity Development' was done for Botswana Surveying and Mapping Directorate. The objective of the project was to assess the capacity, opportunities of establishing the Remote Sensing and Photogrammetry Unit within the Directorate. The ongoing activities of the organization and 14 other organizations in the country were assessed. The potential benefits of the establishment of the unit were presented based on the needs assessments from the stakeholders of geoinformation in the country. The final report with findings and recommendations was submitted to the Directorate.

GMES and Africa Project

The GMES and Africa project, funded by the European Commission to support Land and Water Sectors using Earth Observation Systems is being implemented at the Centre. The project started implementation in 2017 and is estimated to finalize its activities in 2021. As a Regional Implementation Centre (RIC), the Centre implements three service areas in the IGAD and IOC regions, they include: (i) Land Degradation Monitoring and Assessment; (ii) Wetlands Monitoring and Assessment and (iii) Open Geographical Regional Reference Vector Database for water and Agro-ecological zonings. So far, the Centre through the GMES project has managed to develop information products (Land degradation maps and water -Agro-ecological Zones database) on the services mentioned above. Support in development of dissemination platform (geoportal and website) has been accomplished. The activities that were implemented in this reporting period are:

a. Data Collection in Three Service Areas

Ground truthing and related geoinformation data collection was conducted in project implementation countries and hotspots: Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, South Sudan, Sudan and Uganda.

b. Involvement of Private Sector for the Development of Tools and Training

One of the objectives of GMES and Africa Projects is facilitating and working with the African private sectors dealing with the use and application of EOs, data and infrastructure. For that purpose, the AUC has allocated 20% of the budget on this objective. To implement this activity, TORs and implementation guidelines were developed in a way that all the private sectors could benefit. Four private sector involvement areas were identified: (i) Wetlands Vulnerability Analysis, (ii) Land Productivity Analysis, (iii) Wind erosion modelling, and iv) Socio-economic Valuation of Land Degradation and Wetlands. According to the African Union Commission GMES and Africa Project and RCMRD procedures, four consulting firms were awarded: (a) ESIPPS from Uganda on Wetlands Vulnerability Analysis, (b) GEO MIK from Uganda on Land Productivity Analysis,

(c) Locate IT from Kenya on Wind Erosion Modelling, and (d) GRI from Kenya on Socio-economic Valuation of Land Degradation and Wetlands. Each of the four awarded firms developed a tool that can be used to process the data in a way that all the relevant stakeholders can benefit from. The tools developed are using open-source software like QGIS and compatible with the ESRI products.

c. Trainings and Workshops

An online training was conducted from August 3 - 28, 2020 using the RCMRD e-learning platform, more than 80 professionals from member States participated in the training. All the training materials are availed in the RCMRD GMES and Africa geoportal, any interested stakeholder can make use of them. A Stakeholders Products Dissemination Workshop was held from September 14 - 17, 2020, 80 decision-makers from the project implementation countries, participated.

d. Installation of E-Station

Sites for the installation of E-Stations were identified in both the RCMRD and Rwanda Water Resources Board and communication is going on. Installation of the equipment will be implemented by the AUC and EU technical Team.



Development of Land Help Desk In 10 Selected Countries

The project is implemented under AUDA-NEPAD (The New Partnership for Africa's Development) Land Governance Programme whose aim is to assist the member States to build/strengthen existing capacities in designing and mainstreaming Land Governance into their country strategic and/or development plans. In order to improve the data's quality and policy relevance, AUDA-NEPAD worked with the Centre and the Centre de Suivi Ecologique (CSE) to carry out an assessment of existing administrative data in ten countries. Five of the countries (Anglophone) were covered by RCMRD: Uganda, Ethiopia, Ghana, Botswana and Namibia. The other five countries (Francophone) were covered by CSE: Mali, Benin, Burkina Faso, Madagascar and Cameroon. In addition to conducting the country assessments, AUDA-NEPAD and RCMRD supported the establishment of country help desks within relevant Ministries to: (i) Help better organize land data to enhance their usefulness for land agencies operations, internal monitoring and data management by the Ministry of Lands; (ii) Identify ways for using geospatial data and appropriate information technologies to effectively support policies on land governance, functioning of land markets, and public revenue collection, (iii) Identify ways to improve the quality of existing and new data as well as ensuring that data confidentiality is not being breached and, (iv) Use administrative data on land to provide input into policy priority setting and design and continued monitoring of specific land-related interventions in collaboration with other agencies, and (v) Routinely produce aggregated reports for use by academic community and universities. It is envisioned that the help desk will be used as a platform by the participating countries to integrate land data into different types of sectoral strategies and plans. Some of the data that will be made available to the help desk were identified during the country visits. The three broad categories of data that will be availed into the help desk are Social Economic Data, Spatial Data and Administrative Data. The help desk has been designed to support two different types of datasets i.e., the spatial (geospatial) and non-spatial data. The project started on July 2019 and it was expected to end on 19th March 2021.

Sustainable Water and Air Quality Monitoring Systems in Africa - Nairobi Pilot Project

The United Nations Environment Program (UNEP) entered into an agreement with the Centre to implement the Sustainable Water and Air Quality Monitoring Systems in Africa project. This pilot project aims at monitoring both air and water quality environment within the Nairobi Metropolitan Region. UNEP is catalyzing this opportunity through this project to assess Nairobi Metropolitan Region water and air management mechanisms, which should include regular assessments and monitoring activities which are meant to provide up-to-date and scientifically credible data for decision making during management. The project seeks to dive deeper into Sustainable Development Goals, especially SDG 11.6.2; on Air Quality in the cities and SDG 6 on Water and Sanitation. The project area covers the entire Nairobi Metropolitan region. The project aimed to: Prepare a GIS mapping of the ambient air of Nairobi Metropolitan environment, and Prepare a GIS mapping of the Nairobi River Catchment - ambient water environment including settlement areas, infrastructure and identification of pollution hotspots. The project duration was six months and was completed in December 2020.

Supply of High-Resolution Satellite Images and Creation of GIS Base Map for Moyale Town, Kenya

Urban Planning and Design Branch Laboratory (UPD Lab) of UN-habitat Lab in cooperation with Marsabit County initiated steps towards achieving an Integrated Strategic Urban Development Plan (ISUD) for the town of Moyale, at the Northern border of Kenya and Ethiopia. The UN-Habitat contracted the Centre to provide technical expertise required to actualize the ISUD through provision & processing of high-resolution satellite images and vector data extraction for the town. The objective of the supply of the high-resolution images and vector data extraction was to support the planning process by providing a GIS digital base map for Moyale town. The major output of the project was a digital GIS Base Map for 64km² in Moyale Town capturing all the necessary information required in generating a plan. All the products were handed over to the client.



A stakeholder viewing a high-resolution satellite wall poster at the Centre

Malawi AGCOM - Process Monitoring of Pilot Implementation of The New Land Laws in Malawi

The Centre is part of the implementing team working on this project. The Centre was awarded the contract and undertook the project inception in October 2019. The Malawi Government is implementing Agricultural Commercialization Project (AGCOM) with support from The World Bank. This project is being implemented by the Ministry of Agriculture, Irrigation and Water Development in collaboration with the Ministry of Lands Housing and Urban Development. To achieve the goal of AGCOM, the Ministry of Lands Housing and Urban Development (MoLHUD) is undertaking pilot implementation of key land-related laws including; The Land Act (2016), The Physical Planning Act (2016), The Land Survey Act (2016), etc. Before the roll out of the program in the entire country, there is need to generate evidence-based data to guide the process. It is in this context that the Centre was contracted as an external reviewer to monitor the processes and ascertain the fidelity of execution of the provisions of the relevant laws. The piloting of the laws is being undertaken in six pilot districts - Karonga, Rumphi, Nkhosachota, Mchinji, Chikwawa and Nsanje before national roll out. The main objective of the project is to monitor the processes related to the implementation of key land-related laws in the pilot districts.

Soils4Africa Project

The Centre was contracted to implement the Soils4Africa project, funded by the Horizon 2020 programme of the European Union. Soils4Africa will put in place by 2024, an Open-data Soil Information System (SIS). The SIS will facilitate farmers, agri-businesses, scientists, and policy-makers in their efforts towards sustainable intensification of agriculture and boosting food security; by improving the quality and availability of African soil data. The Centre's key role in the project was development of user requirements for the SIS (Work package 3); technical design of the SIS; building the SIS; demonstration of soil information products based on SIS use cases; capacity building of the SIS hosting institute (Work package 6). The Centre being a spatial data hub is still supporting input data acquisition for continental mapping of agriculture land.

Natural Resources Geoportals Project - FAO

The Food and Agriculture Organization (FAO) of the United Nations entered into an agreement with the Centre on December 2019 through a Letter of Agreement (LoA) to support in the Development of Natural Resource Geoportals and Interactive Maps and Atlases. The Natural Resources Atlas was generated courtesy of collaboration of various stakeholders. The stakeholders included: National Land Commission, Kenya Forest Service, Kenya Wildlife Service, National Environment Management Authority of Kenya, Kenya Marine and Fisheries Research Institute, National Museums of Kenya, Kenya Agricultural & Livestock Research Organization, State Department for Fisheries Aquaculture and the Blue Economy, Water Resources Authority among others. The stakeholders came together to develop the Natural Resource Atlas to assess the country's natural capital with a view to providing a visually-orienting information hub regarding the country's natural resources. The map development process used available geo-spatial data from mentioned institutions and were used together with ancillary information geared towards use in policy and decision-making. The project's four outputs are: (i) A functional geoportals of Natural Resources Inventory developed, (ii) A multi-stakeholder engagement framework on Natural Resource Inventory Atlas developed, (iii) Capacity of government officers on geo-data analysis and geo-visualization strengthened, and (iv) A Resource Atlas and cartographic maps. Activities which have been accomplished include: Project Inception Meeting, Stakeholders Workshop, Conversion and Cleaning of Data, Data Processing and Analysis, Cartographic Map Updating, Design and Generation, Design and Development of Enterprise Geodatabase, Development of Geoportals.



A screen shot of the RCMRD Geoportals

<http://geoportals.rcmr.org/>

Lorem ipsum

The Regional Food Balance Sheet Initiative with AGRA

The Centre partnered with Alliance for Green Revolution in Africa (AGRA) in a new initiative to create digital Regional Food Balance Sheets. The project titled, "Strengthening Agri-Foods Data Systems to inform Food Security Policies & Trade in Sub-Saharan Africa", aims to contribute to the enhancement of regional food security and sustainable agriculture transformation. The project whose implementation is underway, is being undertaken in two phases, with the Centre playing a key role in improving crop production data by incorporating satellite data and geo-spatial technologies and systems, undertaking ground truthing of digital food crop forecasting data and calibration of commodity balance sheets. The partnership also aims to strengthening the capacity of the Centre to offer services in digital crop forecasting as well as the capacity of Ministries of Agriculture on application and use of the remote sensing techniques in food crop forecasting and reporting and dissemination of production forecasts reports and other market information to governments, private sector, relief agencies, and other stakeholders for decision making.

ESRI-RCMRD MoU

Esri and RCMRD signed an MoU with the purpose of providing a framework for a cooperative business relationship in regard to geospatial capacity building within RCMRD's member States. Discussions on the activities are ongoing.

GeoHUB Africa

The Centre introduced a new component; the GeoHub Africa whose aim is to offer an opportunity for innovative activities to spur new development/improve the existing ones to fit a wider market spectrum. GeoHub Africa acts as an incubator for innovative ideas, business idea start-up, application development, and research. Currently, the initiative is developing a Geospatial artificial intelligence course prototype, to be tried internally.

RCMRD Integrated Project Management System

RCMRD Integrated Projects Management System was developed to assist in managing projects and also act as a digital repository of the projects' related documents. The system will enable the Centre to keep track of proposals developed by various sections, the entities engaged in those proposals, the outcomes, and subsequent implementation details. The database will be a key resource for institutional reference, as far as the coordination and submission of funding proposals are concerned.

SERVIR Eastern & Southern Africa Project

The Centre entered its third phase in the implementation of the SERVIR Eastern and Southern Africa project, a joint initiative of the U.S. Agency for International Development (USAID) and National Aeronautics and Space Administration (NASA). The project's goal is to increase the ability of African institutions to apply geospatial technologies to improve the resilience of the region to the impacts of climate change and ensure land use management reduces greenhouse gas emissions. The Centre through the project continued to implement activities in the member States and more specifically in Ethiopia, Kenya, Malawi, Rwanda, Tanzania, Uganda and Zambia. The project implements activities under four main service areas, as well as cross-cutting activities that support the service areas activities and the Centre in general. The following services were implemented under the four main service areas: 1. Agriculture and Food Security Service Area implemented the: (i) Regional Cropland Assessment and Monitoring, (ii) Rangeland Assessment and Monitoring, and (iii) Frost Monitoring and Forecasting services. 2. Land Use Land Cover Change (LULC) and Ecosystems Service Area implemented the: (i) LULC Mapping and (ii) the Mapping and Modelling of Invasive Plant Species services. 3. Water Resources and Hydro- Climatic Disasters Service Area implemented the (i) Regional Streamflow Monitoring and Forecasting and (ii) Satellite-based Water Quality Monitoring (platform development is on-going) services. 4. Weather and Climate Service Area continued work on the Climate Change Vulnerability, Impacts and Assessments Service, where two activities were undertaken.

Sampling Frames for The Kenya Crop Insurance program

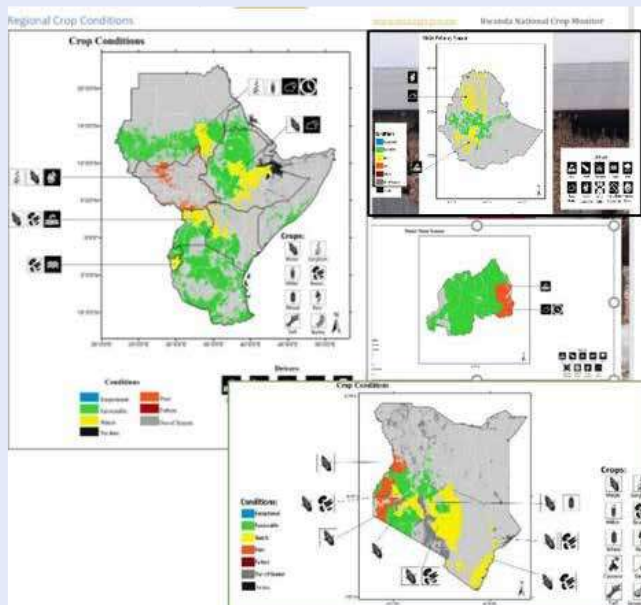
The project supported the Ministry of Agriculture in Kenya through provision of imagery and sampling frames for the Kenya Crop Insurance program. Through this support, the ministry and the Government of Kenya at large was able to reduce sampling costs by over 70%.

Emergency Food Security Response Team on COVID-19 and Desert Locust in Kenya

The Centre through SERVIR project worked with the Emergency Food Security Response Team on COVID-19 and Desert Locust in Kenya, to develop a food security report detailing the 2019 yield estimates and 2020 long rains forecast using Regional Hydrologic Extremes Assessment System (RHEAS) and production maps.

Regional and National Crop Monitoring

The Centre through SERVIR continued to support implementation of the IGAD region crop monitor and participated in the Greater Horn of Africa Climate Outlook Forum (GHACOF) meeting held in February 2020, where they provided input in the Climate and Agriculture technical sessions. Continued support has also been provided to the Ministry of Agriculture in Kenya and Rwanda in developing their respective national crop monitors.



Regional and national Crop Monitors

Climate Data Access and Use

The Centre continued to develop and improve climate data access through the Early Warning Explorer (data.rcmrd.org/ewx-viewer) to support services that depend on weather and climate data across its member States. This web service currently contains satellite-based climate datasets that are unbiased using ground weather/climate observations. The Centre continued its support to the Ministry of Water and Basin Water Boards (Wami Ruvu and Rufiji) in Tanzania by building capacity on climate data quality

Control (QC) through QC assessments using recommended practices from the World Meteorology Organization (WMO), and using GeoCLIM, an open-source geospatial climate data analysis tool to blend gridded data (in this case CHIRPS rainfall) with data from hydrometeorological and rainfall stations installed by the two basins. In a prior activity in the two basins, the Centre supported a climate vulnerability mapping activity through the USAID Water Resources Integration Development Initiative (WARIDI) project. A participatory process with local governments and communities managed to develop and implement village land use plans (VLUPs) and record 1,961 Certificates of Customary Rights of Occupancy (CCROs). In other locations, the vulnerability maps were used as one of several criteria for selecting the locations for 50 water projects which will supply clean water to 520,000 people. Communities surrounding the water supply projects were trained on water-efficient agriculture techniques and water conservation, particularly in dryer areas. Additionally, WARIDI worked with local technical assistance entities to train farmers on Climate Smart Agriculture (CSA) approaches such as crop diversification, agroforestry, to improve soil organic matter, and to use small-scale intensified agriculture practices which improve water use efficiency.

In addition, the Centre worked with a NASA funded Applied Science Team from the University of Colorado, Boulder to conduct a rainfall validation analysis by comparing Trans-African Hydro-Meteorological Observatory (TAHMO) station rainfall data with CHIRPS gridded dataset at daily, pentadal (5-day), monthly and seasonal time scales in Kenya, Rwanda and Ethiopia. Validation process between CHIRPS, TAHMO and three other satellite rainfall products is currently ongoing. The objective of this assessment is to integrate TAHMO rainfall with CHIRPS gridded estimates and use the improved product to develop a groundwater demand model that also uses other environmental variables that affect groundwater use. The project is using sensor-based groundwater use data installed across Ethiopia and Kenya.

In Zambia, the Centre is supporting Zambia's Ministry of Health (MOH) National Malaria Centre and partners in Zambia by undertaking climate data analysis for three districts in three provinces in Zambia as a contribution to USAID supported President's Malaria Initiative. The climate analysis involved a rainfall and temperature time series analysis in Zambia's intervention provinces of Eastern, Luapula and North-western to assist in control and elimination of Malaria. The climate analysis information is useful to the Ministry of Health and the President's Malaria Initiative in unpacking the correlation between the increased malaria cases and rainfall in a setting of inadequate vector control intervention coverages.



a screenshot of the EWX Visualization Tool. data.rcmrd.org/ewx-viewer

GIS Portal for Supporting Conservation in Kenya's Conservancies

The Centre through the SERVIR project, and in collaboration with Kenya Wildlife Conservancies Association (KWCA) developed a geoportal for hosting conservation data to support archiving, querying, analyzing and interpreting GIS conservation-based data for improved communication and management of the conservancies

State of The Art Flood Monitoring and Forecasting in The East Africa

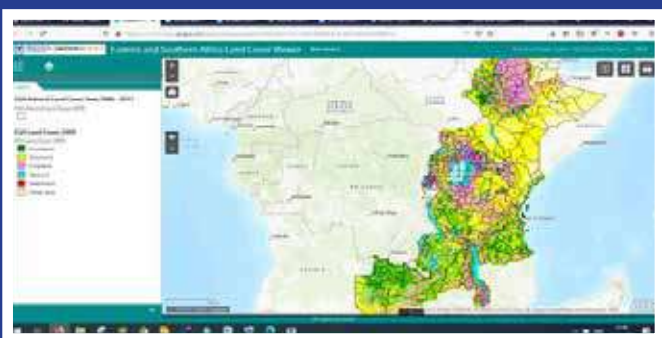
In collaboration with the University of Oklahoma (USA), the Centre worked with regional partners on the development and piloting the use of Ensemble Framework for Flash Flood Forecasting (EF5) model for flood monitoring and forecasting in the East Africa region. The EF5 modelling framework allows the users to monitor and forecast hydrological phenomena such as floods and droughts for early warning and preparedness for emergency response.

Flood Risk Assessment and Modelling

Flood Risk Assessment of Tana River and River Sabaki project that covered areas along the rivers in Garissa, Tana River and Kilifi counties in Kenya was completed. The objective was to assess the flood risks impact and develop a hydrological model. For that purpose, all the socio-economic infrastructures exposed to the risk such as croplands, pastoral areas, settlements, roads, schools, forest, health services, veterinary services and others were identified and mapped. The output of the study will be presented to the local communities, policy decision makers and researchers.



Demonstration to USAID about the Application of products and services



A screen shot of the ArcGIS Web Service Visualization Tool
<https://rcmrd.maps.arcgis.com/apps/webappviewer/index.html?id=c954194840d74c48a760485fe00fb1e>

Enabling Annual Land Cover Change Monitoring in the Eastern and Southern Africa Region

The Centre through SERVIR project worked with the NASA AST team led by Sean Healey from the US Forest Service to conduct a series of dissemination workshops in FY2020 to create awareness and collect user feedback on the outputs. The project had three sets of outputs: reference data collection to inform statistical estimation of changes taking place, annual land cover maps between 2000 and 2017 to facilitate visualization of the change occurrence and, a visualization tool to increase and enable access to the data. In this reporting period, the team focused on utilizing the feedback received from all the project countries to improve the map data, development of a visualization platform and in increasing awareness. The data developed during this fiscal year can be accessed through the ArcGIS Web Service and the Early Warning Explorer

The methodology used time series data for reference data collection and also in the mapping process. The Google Earth Engine was used for analysis and relied on Continuous Change Detection and Classification (CCDC) algorithm to detect the change occurrence. This particular algorithm and time series data was very useful in getting rid of recording phenological change as a change process. The CCDC data, though also an output of this project has not been publicly released yet. Google is planning to make a global release for the same and the PI in Google was part of the Hub team. The CCDC change is done at pixel level.

SERVIR E&SA is also participating in consultations to streamline a LULC strategy which covers delivery and impact beyond data development by ensuring that SERVIR hubs' outputs in this thematic area inform impact, use and policy decisions. Different pathways have been proposed for this strategy which include: Measurement Reporting Verification (MRV), Natural Capital Accounting (NCA), support to other services, land use planning, ecosystem monitoring and reporting etc. For NCA, the SCO is looking into partnering with Conservation International (CI) to ensure that the SERVIR hubs gain the necessary capacity to address this particular impact pathway. Initial consultation meetings have been held and the plan is to have more consultations with CI in FY2021.

The Centre together with other partners around the globe have been engaged in supporting review of Measurement, Reporting and Verification (MRV) tools through support from Global Forest Observations Initiative (GFOI), World Bank, consultants and the SERVIR Science Coordination office (SCO). The consultancy involves collation of existing tools that support processing chain of MRV and out of this develop comprehensive tools for MRV report. The tools are split into 3 modules. Part one dealing with creation of image mosaics from multiple sensors, using different open-source tools (QGIS, GEE) to collect training data and lastly land use classification. Part 2 modules focus on change detection using different tools (CCDC, Land Trends and CODED). The last part (Part 3) focused on developing tools for sampling, sampling design, response design and statistical estimation. This process started in 2020 and all tools developed shall be availed for public access.

Further, the World Bank and the RCMRD hosted a webinar in December 2020 on new satellite-based tools and approaches in monitoring of dry forests. The webinar focused on introducing the new and innovative tools developed by the Satellite Monitoring for Forest Management (SMFM) project. The webinar consisted of two sessions: (i) a general introduction to using satellite data in forest monitoring and (ii) a “deep dive” to the tools developed during the project. It was further an opportunity for RCMRD to showcase all the tools and services that it had developed in support of MRV.

The RCMRD further supported other activities related to the service area that included: Review of the SilvaCarbon 'Sampling based Estimation of Area and Map Accuracy' training module that is being done in collaboration with USAID and Boston University through SilvaCarbon. The material for this training resource was published in the US Department of Interior Learning system and can be accessed from: <https://edoiu.doi.gov/course/view.php?id=82>. As part of the Kenya REDD Technical Advisory Group (TAG) team, the Hub reviewed the consultancy report for Kirisia Forest that was being supported by UN FAO to ensure that the baselines developed were using acceptable MRV methods. Supported the Digital Earth Africa (DEA) program to develop validation data using Collect Earth online that would be used to improve the Water Observations from Space (WOfS) product.

SAR SilvaCarbon Trainings

A meeting with the SilvaCarbon Regional Program Manager for Africa (based in Nairobi), was held on how to better collaborate with RCMRD. A presentation was done on what the Centre has done on land cover mapping including support provided through Collect Earth to the Forest Resource Assessment of 2010 and some of the training conducted through Time Sync, a reference data collection tool very similar to Collect Earth. The Centre also started a part-series of SAR training that addresses various challenges. The first two parts focus on the basics and fundamentals of SAR, using oil spill detection as an example, and was conducted in September 2020. Parts three-six will focus on flood mapping, deforestation and degradation mapping, biomass estimation, and urban mapping.

The Centre's Engineering Workshop

The Centre's Engineering workshop whose, main activities involve maintenance, calibration, and repair of surveying instruments continued to offer its services to the member States. The calibration plan for the year 2020 targeted servicing instruments in eight member states: Botswana, Eswatini, Ethiopia, Lesotho, Mauritius, Tanzania, Uganda, and Zimbabwe but, due to the challenges posed by the COVID-19 pandemic, the Centre managed to service 20 instruments in Zimbabwe. Also, the Centre serviced approximately 140 surveying instruments from private practitioners in Kenya.

Community Based Flood Early Warning System (CBFEWS) Project in Malawi - UNDP

The Centre is the lead consultant in the implementation of the Community Based Flood Early Warning System (CBFEWS) project in Malawi, working together with ICIMOD and Sustainable Eco-Engineering (SEE). The project was awarded after a response on the proposal under Green Climate Fund (GCF) through United Nations Development Programme (UNDP) as the accredited institution. The project is being executed in collaboration with the Department of Disaster Management Authority (DoDMA), Department of Water Resources (DWR) and Department of Climate Change and Meteorological Services (DCCMS). The project targets eight districts earmarked as the flood prone districts which include Karonga, Dedza, Rumphi, Nkhata Bay, Nkhokota, Salima, Zomba and Phalombe. The CBFEWS components include, telemetric water level measuring devices installed upstream of a flood prone river, a data upload unit installed within 3 kilometers of the and an alarm in the flood impacted regions downstream. To ensure sustainability of the project, the project is being implemented in collaboration with the local institutions, local government agencies, and community participation. The implementation phase 1 (Inception) and Phase-2 (Scoping and Design) have been completed. Ultimately, the communities living in the flood prone downstream areas will receive early warning via SMS and Siren alarm with sufficient lead time for response whenever flood water reached critical level at the upstream water level sensor location.



Engineering section staff that conducts repair, maintenance and calibration of survey instruments

The AfriGEO Secretariat at RCMRD

The AfriGEO is an initiative of the African community in GEO aimed at providing a coordination framework and platform for Africa's participation in GEO. In addition, it is a: (i) Pan African initiative to raise awareness and develop capacity on EO for governments, research organizations and the commercial sector; (ii) Framework for strengthening partnerships and collaborations within Africa; (iii) Gateway into Africa for international partners; and (iv) Support mechanism for the implementation of GEO objectives and programmes in Africa. The AfriGEO Secretariat, through a resolution of the 2018 Steering Committee meeting held in Gabon, was moved to the Regional Centre for mapping of Resources for Development (RCMRD) based in Nairobi, Kenya from Geneva where it had been hosted since its inception. Further details on the AfriGEO objectives and action areas guiding the collaboration with RCMRD are available at <https://www.earthobservations.org/afrigeo.php>.

a. New Memberships - Rwanda and Namibia joined the AfriGEO as new member countries, bringing the membership of the African countries to 30, with a current Global Membership of 111 countries.

c. Hackathon- Desert Locust - The goal of the Kampala INSPIRE Hackathon 2020 was to build and strengthen relationships between several EU projects and African communities that started in 2019 with the Nairobi INSPIRE hackathon. RCMRD/AfriGEO was engaged as a co-organizer with Lilian Ndungu as the contact person and mentor for the Desert Locust challenge as well as contributing to the Smart Afrihub and EO4Agri challenge. This also resulted in the RCMRD Geoportal and open data portals being added in the Smart Afrihub. See links: <https://www.smartafrihub.com/rcmr-geoportal-and-open-data-portal> ,and <https://www.plan4all.eu/2020/03/rcmr-as-a-co-organizer-of-kampala-inspire-hackathon/>

b. GEO Land Degradation Neutrality- The AfriGEO Secretariat participated in two virtual meetings held on March 24 and April 1, 2021 following cancellation of the physical meeting that was supposed to be held in Bonn from March 23-25, 2020. The purpose of the workshop was to develop minimum data quality standards for the underlying data, methodology/algorithms, data products and tools used for calculating SDG indicator 15.3.1 (proportion of land that is degraded over total land area) and estimating changes in its sub-indicators (land cover, land productivity and carbon stocks). The objective was to ensure consistency, coherence and comparability of datasets supplied by various data providers. The two meetings also discussed the findings from an electronic survey circulated in February to gather opinions on what data standards should be applied to the monitoring of SDG 15.3.1 sub-indicators for national reporting as well as for land use planning and decision-making processes. For AfriGEO this means harmonization of methods and data being used to conduct land degradation studies across the continent. The process also provides an opportunity for regional representation and contribution to the standards being developed.

African countries GEO memberships is summarized in the Table below.

1. Algeria	2. Guinea	3. Rwanda
4. Burkina Faso	5. Guinea-Bissau	6. Senegal
7. Cameroon	8. Kenya	9. Republic of Seychelles
10. Central African Republic	11. Madagascar	12. Sierra Leone
13. Republic of the Congo	14. Mali	15. Somalia
16. Cote d'Ivoire	17. Mauritius	18. South Africa
19. Egypt	20. Morocco	21. Sudan
22. Ethiopia	23. Namibia	24. Tunisia
25. Gabon	26. Niger	27. Uganda
28. Ghana	29. Nigeria	30. Zimbabwe

d. Working Group Engagements - A series of concurrent working group (WG) workshops were held in Pretoria from February 18 to 21, 2020. The Secretariat's role after these WG deliberations will be to work through the WGs Co-chairs to ensure a clear implementation plan for the actions established and support them through this process as they continue engaging with the AfriGEO community. The outcomes of the working groups involved are highlighted below.

e. Data and Infrastructure Working Group - This is a working group that looks at the EO infrastructure systems on the continent and identifies the infrastructure gaps, barriers and how to address them. The WG also proposes areas for collaboration whether in sharing data or capacity building.

f. Land Cover and Land Degradation Neutrality - This WG is focused on addressing issues and barriers around land cover and land degradation neutrality. It looks at existing tools, data and the comprehensiveness of those in addressing the existing gaps in data analytics, capacity building and data quality standards and looks for opportunities to address these needs either through funding opportunities or collaborative research.

g. Statistics -The linkage of statistics organizations to Earth observation data is not one that can be ignored, however, more often than not they are forgotten in EO conversations. It is in this regard that this working group was developed and brought together to understand their needs and see how they can be enticed to use more EO data in gap filling.

h. AfriGEO COVID-19 - The AfriGEO COVID-19 WG is an ad hoc group formed in April 2020 to support regional needs of countries in using Earth observation data and information in responding to COVID-19. The WG holds bi-weekly meetings. The main objective of this WG is to set up an environment for countries to share learning lessons and enhance use of Earth observation in addressing COVID-19 related challenges and also in its utility for recovery and response. The WG was also able to hold a virtual webinar in August 2020, drawing in a bigger audience.

Some of the resources shared through the WG include:

- 1) Africa Geoportal: <https://www.africageoportal.com/pages/covid-19-response>
- 2) Digital Globe open data for disaster response (30cm) for cities globally: <http://www.digitalglobe.com/ecosystem/open-data>; https://blog.maxar.com/open-data-program/2020/open-data-response-to-the-covid-19-pandemic?utm_source=twitter&utm_medium=organic
- 3) GEOSS: <https://www.geoportal.org/?fdataSource=dab>
- 4) European Commission; GHS-BUILT, GHS POP, Landsat based: <https://ghsl.jrc.ec.europa.eu/download.php?ds=pop>
- 5) Facebook Connectivity Lab and Center for International Earth Science Information Network - CIESIN - Columbia University. 2016. High Resolution Settlement Layer (HRSL). Source imagery for HRSL © 2016: <http://explore.digitalglobe.com/Basemap-Vivid.html>; <https://www.ciesin.columbia.edu/data/hrsl/#data>
- 6) African Union Support for COVID 19: <https://africacdc.org/covid-19/>

Support to GEO Secretariat and Regional Coordination

The Centre supported engagements with the Working Group on Disasters Risk Reduction that is led by James Norris at the GEO Secretariat, co-developed success stories and contributed to GEO publication on Earth Observation for Sustainable Development. The Centre also offered recommendations for the African Cities Network.

Further, the Centre has contributed to coordination of activities for various regional stakeholders, among them SEACRIFOG; AfrREN; GeoGLOWS; Kenya Space Agency, and the Secretariat meetings involving SANSA, the AfriGEO Symposium, the GEO Week, and a Virtual meeting held in March 2020. Other engagements include the collaboration with the CEOS Working Group on disasters to support some of the regional flood mapping efforts engagements with GEOGLOWS on avenues for collaboration on their flood forecasting tool, new memberships follow ups for Chad, Liberia, Botswana and Namibia, coordination with the GEO Secretariat which included linkages of GEO initiatives in Africa, the GEO Virtual Symposium 2020 in June 2020, the GEO Mid Term Evaluation, the GEO Award nominations reviews, the Africa CONNECT 3 engagements and organization of GEO Plenary 2021 and the AfriGEO Symposium 2021.

CEOS Capacity Building Workshop

On 11th March, 2020 Dan Matsapola, from SANSA presented on AfriGEO capacity building activities and linkages with other regional GEOs at the CEOS Working Group on Capacity Building and Development held in California, USA.

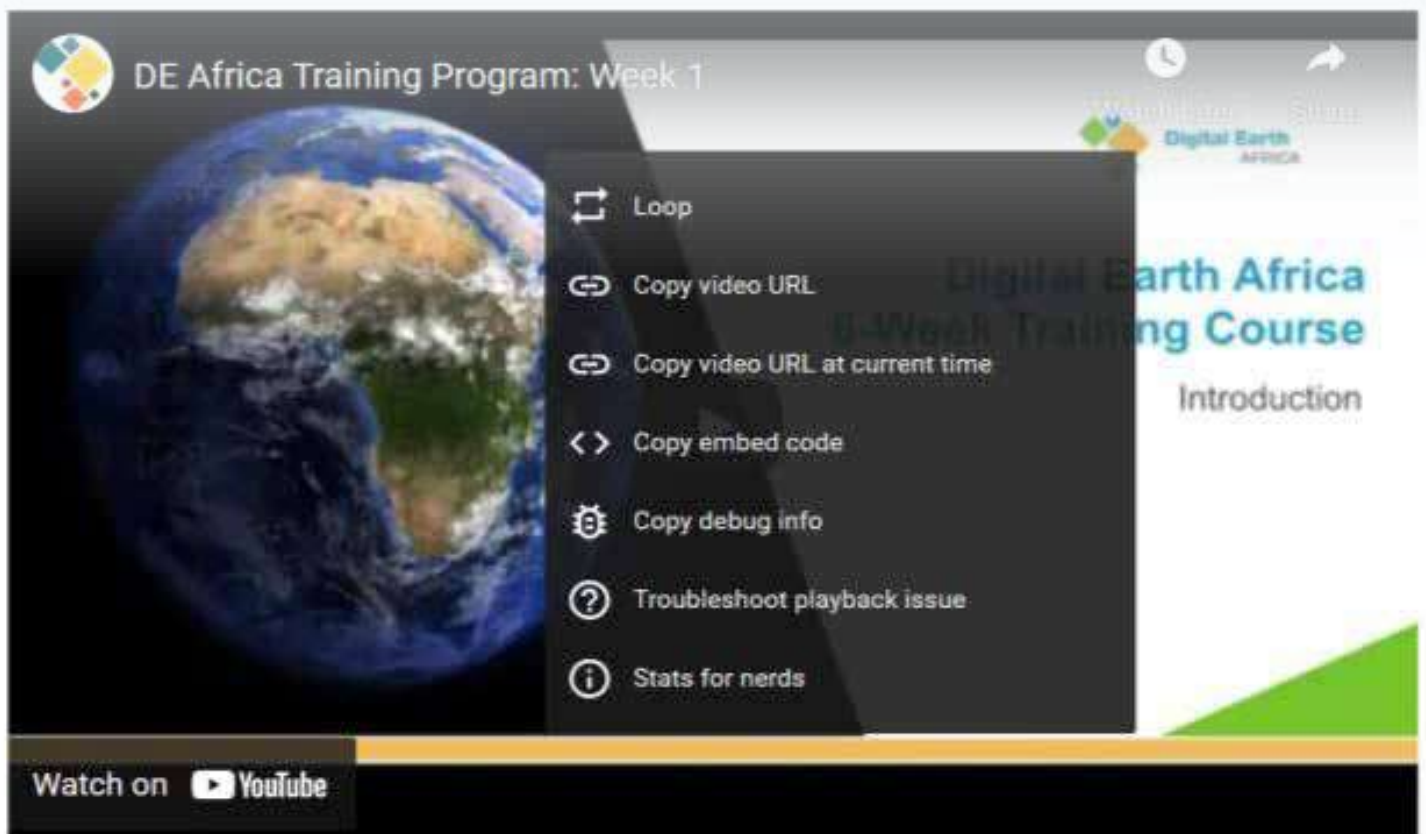
Digital Earth Africa

The Centre is at an advanced stage of developing a partnership agreement with the Digital Earth Africa (DEA). The DE Africa provides a routine, reliable and operational service, using Earth observations (EO) to deliver decision ready products enabling policy makers, scientists, the private sector and civil society to address social, environmental and economic changes on the continent and develop an ecosystem for innovation across sectors. The Water Observation from Space (WofS) is the first continental product for Africa, a beta version has already been deployed online and can be accessed by end users for quality analysis and validation (<https://www.digitalearthafrica.org/platform>). The WofS data product is already being used by Tanzania to inform water management decisions. A Continental crop mask will be the second product and validation plans are underway. A six-week Training of Trainers is currently ongoing, and the participants will in turn be used to train the RCMRD member States. Currently RCMRD sits in an 18-member Technical Advisory Committee for the DEA. The Centre has been working with DE Africa to develop [the Gender Equality and Social Inclusion \(GESI\)](#) and [Capacity building](#) strategies that have now been made public.

g/en/latest/

To get started, watch the short introductory video below. Then click **Session 1: Introduction** to begin. Other sessions will be added as the course progresses.

Should you require help, see the [Frequently asked questions](#) and [Contact us](#) pages.



SPEARHEADING KNOWLEDGE MANAGEMENT

Regional Biodiversity Knowledge Hub Launched in Eastern and Southern Africa

RCMRD, the International Union for Conservation of Nature (IUCN), and Joint Research Centre of the European Commission (JRC) are jointly implementing the Biodiversity and Protected Areas Management Programme (BIOPAMA), whose aim is to assist the African, Caribbean and Pacific (ACP) countries in developing a framework for improving technical and institutional approaches to conserve biodiversity, in protected and conserved areas, through regional cooperation and capacity building activities. RCMRD's main role is to develop and host the Regional Resource Hub (RRH) for Eastern and Southern Africa as well as the Regional Reference Information System (RRIS). RCMRD, IUCN, and JRC officially launched the Regional Resource Hub as one of its flagship knowledge products, the most comprehensive analysis on the state of protected areas in Eastern and Southern Africa. The launch took place on November 24, 2020 in the presence of Heads of Protected Area agencies, ministries responsible for protected areas and wildlife, high-level technical institutions, Regional Economic Communities and BIOPAMA donors and partners. The Regional Resource Hub is a knowledge hub that compiles and analyses relevant data and provides information to support field interventions and policy dialogues, for fair and effective management and governance of protected and conserved areas in Eastern and Southern Africa.

The Regional Resource Hub acts as one of the regional observatories implemented by BIOPAMA Programme, and is hosted by the RCMRD in Eastern and Southern Africa. The Hub includes an information system, co-developed with the Joint Research Centre (JRC) of the European Commission, which helps decision makers to track progress on conservation targets, and to manage and assess the protected and conserved areas in the region. Other similar hubs have been established with BIOPAMA's support in Western and Central Africa, the Caribbean and the Pacific.



"Effective conservation, management and governance of protected and conserved areas in Eastern and Southern Africa is crucial to our long-term economic growth and development. The establishment of this Regional Resource Hub is a great milestone as it will facilitate the provision of relevant information and data to support policies and effective decision-making on protected and conserved areas which are our invaluable natural heritage"

Luther Bois Anukur,
Regional Director, IUCN Eastern and Southern Africa Regional Office.

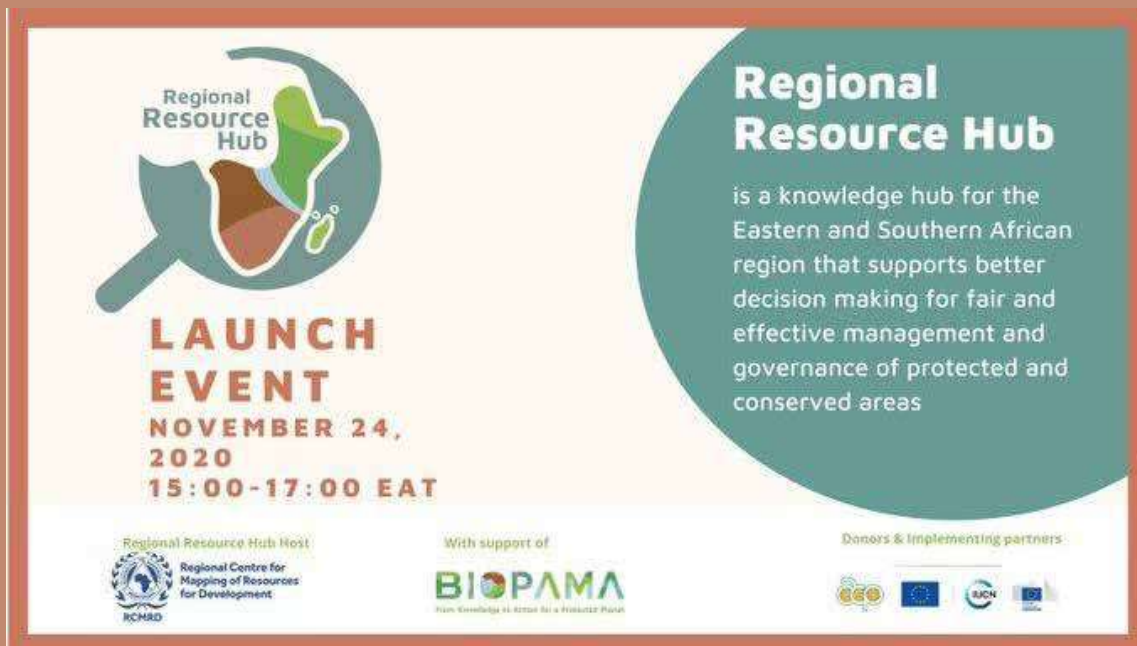
"RCMRD is confident that the data and information availed in the Regional Resource Hub will make a way in delivering useful information to make informed decisions, as the various stakeholders in conservation address the challenges that threaten our biodiversity"

Dr. Emmanuel Nkurunziza,
Director General, RCMRD.



The knowledge generated by the Regional Resource Hub aims to support national governments, regional organizations, NGOs, communities and other organizations, in achieving their biodiversity conservation objectives and to report their progress on multilateral environmental agreements, such as the Convention on Biological Diversity, more accurately.

The “State of Protected and Conserved Areas in Eastern and Southern Africa” report is a flagship knowledge product of the Regional Resource Hub. Launched on the same occasion, this report makes a significant contribution to assessing the current status of the protected and conserved areas in Eastern and Southern Africa and understanding their relevance to the societal needs. “This report demonstrates how systems of protected and conserved areas are an essential conservation strategy for the region, without which the loss of biodiversity would have been much more significant. It also highlights the many gaps in understanding and implementation, and shows us just how challenging it is to achieve effective outcomes for nature conservation”, said Trevor Sandwith, Director, IUCN Global Protected and Conserved Areas Programme (esahub.rcmrd.org).



Publications

- <https://doi.org/10.3390/su12104102>: Mapping Climate Vulnerability of River Basin Communities in Tanzania to inform Resilience Interventions
- <https://doi.org/10.3389/fenvs.2020.00069> Modelling Invasive Plant Species in Kenya’s Northern Rangelands
- <https://doi.org/10.3390/rs12183031> Assessment of a Spatially and Temporally Consistent MODIS Derived NDVI Product for Application in Index-Based Drought Insurance
- <https://www.mdpi.com/2072-4292/12/17/2829> Quantifying Land Use Land Cover Changes in the Lake Victoria Basin Using Satellite Remote Sensing: The Trends and Drivers between 1985 and 2014
- <https://www.sajg.org.za/index.php/sajg/article/view/734> Object-based land use/land cover change detection of a coastal city using Multi-Source Imagery: a case study of Lagos, Nigeria
- <http://www.sajg.org.za/index.php/sajg/article/view/736> Towards achieving Sustainability: Urban Growth analysis and prediction of a coastal city

Article

Mapping Climate Vulnerability of River Basin Communities in Tanzania to Inform Resilience Interventions

Denis Macharia ^{1,†}, Ernes Kaijage ², Leif Kindberg ^{2,3}, Grace Koch ^{1,4}, Lilian Ntunga ^{1,5}, Anastasia Wahome ^{1,6} and Robinson Mugo ^{1,6}

¹ Regional Centre for Mapping of Resources for Development, Nairobi 00101, Kenya; gkoch@rcmrdd.org (G.K.); lkindberg@rcmrdd.org (L.K.); waahome@rcmrdd.org (A.W.); rmgog@rcmrdd.org (R.M.)

² USAID Tanzania Water Resources Integration Development Initiative, Morogoro 766, Tanzania; kaijage@gmail.com (E.K.); leif.kindberg@usaid.gov (L.K.)

³ Correspondence: dmacharia@rcmrdd.org or dmacharia@gmail.com

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Abstract: Increasing climate variability and change coupled with steady population growth is threatening water resources and livelihoods of communities living in the Wami-Ruvu and Rufiji basins in Tanzania. These basins are host to three large urban centres, namely Dar es Salaam, Dodoma and Morogoro, with a combined total of more than 7 million people. Increased demand for ecosystem services from the available surface water resources and a decreasing supply of clean and safe water are exacerbating the vulnerability of communities in these basins. Several studies have analyzed climate projects in the two basins but little attention has been paid to identify locations that have vulnerable communities in a spatially-explicit form. To address this gap, we worked with stakeholders from national and local government agencies, basin water boards and the Water Resources Integration Development Initiative (WARIDI) project funded by USAID to map the vulnerability of communities to climate variability and change in the two basins. A generalized methodology for mapping social vulnerability to climate change was used to integrate biophysical and socioeconomic indicators of exposure, sensitivity and adaptive capacity and produced climate vulnerability index maps. Our analysis identified vulnerability “hotspots” where communities are at a greater risk from climate stresses. The results from this study were used to identify priority sites and adaptation measures for the implementation of resilience building interventions and to train local government agencies and communities on climate change adaptation measures in the two basins.

Keywords: climate change; climate variability; climate stresses; water resources; communities; vulnerability; hotspots; adaptation; resilience; GIS



“The results were also used by WARIDI in the selection of three vulnerable villages: Msufini in Mvomero district, Nguyami in Gairo district and Magana in Kilolo district (Figure 9). These three districts experience droughts and scored relatively high in mean daytime temperature.”

**Denis Macharia,
Weather & Climate Lead**



RCMRD Library

The Regional Centre for Mapping of Resources for Development Library was established in the year 1978. The scope of the Library with both print and non-print materials is 70% geo-information. This includes information materials in remote sensing, geographic information systems (GIS), photogrammetry, land survey, global positioning system (GPS), environment, natural resources management, leadership, management among others. The Library offers lending, reference, referral, selective dissemination of information services among others. In 2005, the Library, which was operating manually, was automated using an integrated library management system (Librarysoft). Since then, a database was established and is continually being updated to reflect both the information materials and users. The Library and its database are a repository for the content and forms part of knowledge management at the Centre.

The RCMRD Library is not only a repository for hard and soft copy information materials but also a home for all Centre staff, students and researchers seeking for specific information in geo-information and other disciplines of knowledge. The Library provides a conducive environment in study, teaching of the various Diploma, Certificate and other short-term courses offered by the Regional Centre Training Institute (RCTI).

ISO 9001:2015 QMS

The ISO 9001:2015 Quality Management System (QMS) was introduced at the Centre in the year 2010 to serve both as a ‘Quality strategy’ and ‘Quality as a strategy’. ‘Quality strategy’ in the sense that, a set of procedures, guidelines and policies would be set across the organization to guide the Centre in offering products and services that meet customer needs and expectations. ‘Quality as a strategy’ since RCMRD would take advantage of ‘quality’ in its products and services as a marketing strategy. RCMRD embarked on QMS documentation and implementation trainings from the same year 2010 and followed all steps guided by the certification body, then by Société Générale de Surveillance (SGS). In July 2014, RCMRD was certified for ISO 9001:2008 QMS, which has since been revised to ISO 9001: 2015 QMS. Re-certification of the new version was done in May 2018 by the Kenya Bureau of Standards (KEBS) and is up to date. The Centre has since been continually improving on its products to ensure they not only meet customer needs, but also world standards.

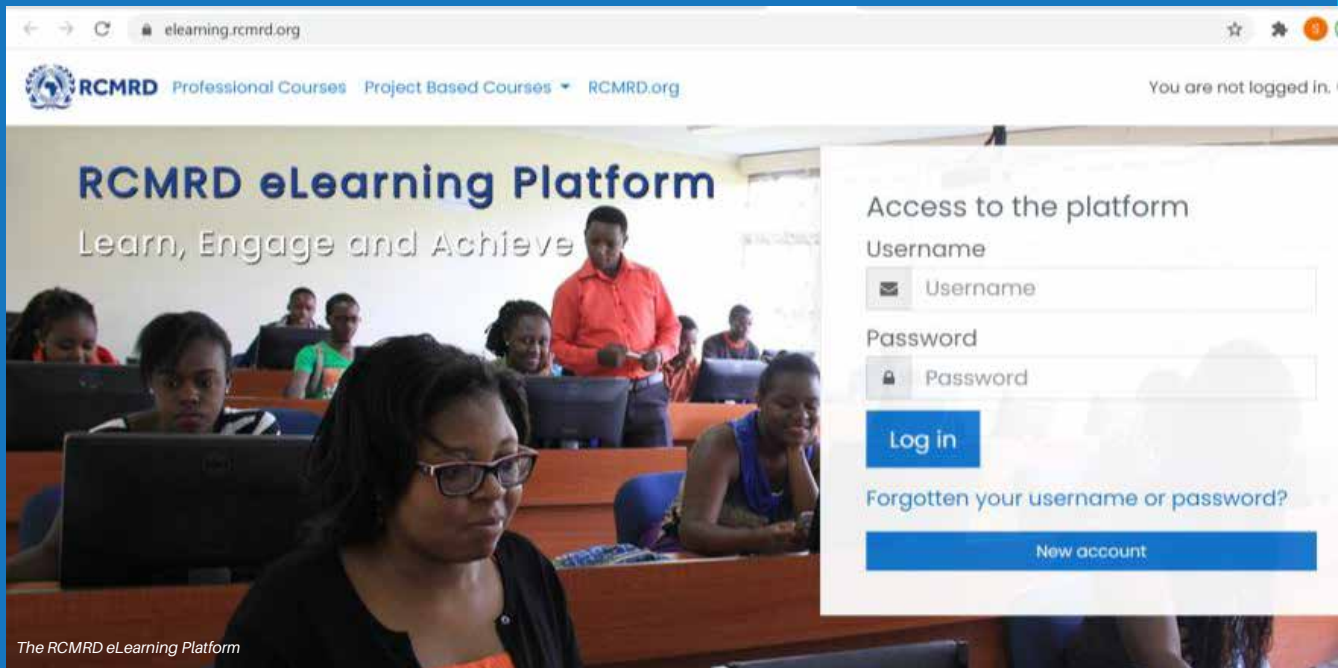


Centre's Principal QMA Officer during an internal training on QMS Documentation and Implementation

Regional Centre Training Institute (RCTI)

The Centre through its training section, the Regional Centre Training Institute (RCTI) has continuously provided geo-information training by disseminating geo-spatial academic programs. The institute has technical Diploma and Certificate programs enhanced through Technical and Vocational Education and Training (TVET) in Land Surveying, Photogrammetry and Remote Sensing, Cartography and GIS, and Information Technology. In the year 2020, there was a growth in enrollment to these technical courses with the numbers growing from 554 in 2019 to 624 (about 12% growth). In order to fill the technical skills needed in member States, the Centre through RCTI offers short courses which are tailor made to end users. These courses are Introduction to Geographic Information System (GIS), CAD Drawings (AutoCAD Civil 3D), UAV Drone Technology, Crime Mapping, Python Programming, among others.





The RCMRD eLearning Platform



A sample flyer used to publicize the online courses offered at the Centre

During the year, the institution started to offer some courses via an eLearning platform so as to reach a wider audience. These include Fundamentals of GIS, AutoCAD, Global Navigation Satellite System (GNSS), Cyber Security, Python Programming, Graphic Design, Digital Marketing, Excel in Business, and International Computer Driving License (ICDL). From these courses, six introductory online videos were produced and 85 students were trained throughout the year.

As a premier of excellence in the provision of geo-information and allied technologies, the institute through the students and staff joined the global movement of GIS Day initiated by Esri, an international supplier of geographic information system software, web GIS and geodatabase management applications. The institute hosted the event virtually and brought together over 200 GIS Software users with an aim of inspiring members of the community to learn and use GIS technology. The event gave a platform to the students to make presentations on the various applications of GIS in their projects. As a way of building capacity among its staff, the RCTI trained three members of staff on Career Guidance. The workshop focused at instilling knowledge to the staff on how to guide the students on career choices, informing the management on changes in the job market and liaising with the market to offer jobs and internship opportunities to the students.

Spatial Data Supply

The Centre’s Data office carries out data acquisition and processing, archiving and cataloguing, dissemination marketing and capacity building. The office disseminated over 3000 open-source data such as MODIS, Landsat, Sentinel and LASAC to the various diverse users which included, member States, government ministries and parastatals, universities, research organizations, internal projects among others. The Centre is also an accredited partner with various global data organizations such as DigitalGlobe (now Maxar) and Airbus who provide high resolution data from sub meter to 30-centimeter resolution. The Centre through this partnership is a reseller of the high-resolution datasets to all the member States at very subsidized rates.

The Centre through the data office also carried out capacity building activities to the member States, on Open-Source Tools, Data and Applications for National Development, in Kampala, Uganda in March 2020. Participants were from the East African region (Sudan, South Sudan, Ethiopia, Uganda, Burundi and Kenya). Due to COVID-19 restrictions the training for the Southern Africa countries was conducted online in September 2020 and had participants from South Africa, Lesotho, Malawi, Namibia and Zimbabwe. From the series of trainings conducted, the Centre was able to gather feedback and now understands the diverse needs of the countries in the member States in terms of data and or services and essentially how the Centre can serve the member States better.

OPEN SOURCE TOOLS, DATA AND APPLICATIONS
Online Course

RCMRD
 About RCMRD
 RCMRD is an intergovernmental organization established in 1975 under the auspices of the United Nations, Economic Commission for Africa (ECA) and the African Union (AU). It serves as a knowledge, data, and services African continent and currently has 20 remaining members. It promotes and facilitates cooperation in land and land related disciplines among member States through technology in her member States. For info, please visit www.rcmrdr.org

Course Objectives
 The training will enable participants with the opportunity to develop critical skills required for remote data processing to address thematic challenges or any particular challenge of interest

Cost: USD 300 Per Person

[Click here to apply](#)

Course Dates: 2nd to 10th Oct 2020
Course Fee: USD 300
Phone: 022796111 / 022991996
Email: rcmrdr@rcmrdr.org

MEMBER STATES:
 Botswana, Central African Republic, Congo, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Niger, Rwanda, South Africa, South Sudan, Sudan, Tanzania, Zambia, Zimbabwe, Uganda, Zambia & Zimbabwe

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 P.O. Box 83, Kampala, Uganda. Telephone: +254 732 961111 / 991996
 Website: www.rcmrdr.org Email: rcmrdr@rcmrdr.org

USGS
 science for a changing world

A flyer of the member States Trainings being offered at RCMRD

SNAPSHOT OF THE 2021 RCMRD WORK PROGRAMME

The Centre's 2021 work program activities will mark the entry of the second half of the RCMRD 2019-2021 Strategic Plan and will draw insights from the preceding two years of implementation as well as the results of the mid-term review of the strategic plan. The Centre's overall priorities will be guided by the key strategic objectives: Enhance Centre's profile through member States and stakeholder's engagement, Have a competent and motivated workforce, Be a financially sustainable & stable organization, Ensure Centre's Infrastructure is adequate and responsive to meet its mandate, Strengthen the Capacity of our members and other stakeholders in geoinformation and allied technologies, Undertake Programs that positively impact our member States and other stakeholders, Enhance members State and stakeholders' capability on Geo-Information and Allied Technologies through advisory services and applied research to develop products and innovations and enhance Centre's Capability on knowledge management effectively.

Even as the Centre proceeds to a new work program year, we are cognizant of the fact that the current pandemic; COVID 19 has and is still affecting the global community in the workplaces, and it is for this reason that the Centre has placed strategic and innovative approaches/measures, some adopted from the lessons learned in the year 2020 and from rich feedback and experiences received from engaging with partners and the Member States, to ensure that all the 2021 planned activities under the various departments, programs, and projects, member States needs will be excellently executed.

FURTHER READING

Please visit www.rcmrd.org/ for more articles, audio visual productions and social media posts on the activities undertaken in FY 2020.



PICTORIAL



The RCTI Master Plan



KISE Road, Nairobi Kenya
P.O Box 632-00618 Ruaraka, Kenya
Office Tel: +254 202 680 722/268 0748
Fax: +254 202 680 747
Office Cell: +254 723 786 161/+254 735 981 098
Email: rcmrd@rcmrd.org



Botswana



Burundi



Comoros



Ethiopia



Eswatini



Kenya



Lesotho



Malawi



Mauritius



Zambia



Namibia



Rwanda



Seychelles



Somalia



South Africa



South Sudan



Sudan



Tanzania



Uganda



Zimbabwe