QUARTERLY NEWSLETTER
VOL. 015

EDITOR: Joselyne Barakagwira & Adrienne Chitayat

THE CENTER OF EXCELLENCE IN BIODIVERSITY AND NATURAL RESOURCE MANAGEMENT (COEB), UNIVERSITY OF RWANDA

Welcome to the Center newsletter, where you will read about the activities we have been involved in recently, including research projects, research trainings, and seminars. The big news is that we were approved as a Category 2 Center under the auspices of UNESCO at the November 2021 UNESCO General Conference. We are in the process of laying the foundation to launch the CoEB as a Category 2 Center, working closely with University of Rwanda leadership, the Ministry of Education, and the Ministry of Environment, and we are excited to step into a new phase for the CoEB. We hope you will join us in meeting our objectives. This is also a big year for me personally as I fulfill my term as President of the Association for Tropical Biology and Conservation (ATBC). This international scientific and professional society was founded in 1963, with the mission to promote research, education, and communication about the world's tropical ecosystems. There are over 900 members from 67 countries, practitioners engaged in science, conservation, development, and environmental policy. ATBC holds annual meetings, publishes the scientific journal *Biotropica*, and is engaged in conservation and capacity building activities worldwide. I hope to encourage you to get involved in this great organization in the coming months. Thank you, Beth *Kaplin*, Director of CoEB

IN THIS ISSUE

Photo: Training youth on biodiversity specimen collection and handling

RESEARCH & MONITORING

6
International collaborations

16
Reports and publications produced

3
New grants awarded

8
Active projects

Waterbird Counts in Rwanda

Photo: Pink-backed Pelican by Claudien Nsabagasai

Globally, waterbirds are known to be good indicators of wetland ecosystem health. However, they face a variety of threats (e.g., habitat destruction, pollution) causing species declines and extinctions. Waterfowl and their wetland habitats are threatened by climate change and human activities that include unsustainable agriculture, overexploitation of aquatic resources, and pollution. Through funding from the African Bird Club (ABC), Rubicon, and Natagora two waterbirds censuses were conducted in Rwanda in June 2021 and February 2022.

The Rwanda Waterbird Counts is a 'citizen science' initiative where volunteers collect information about water bird species and abundance in important wetlands in the country. The counting activity

nvolved graduate students from University of Rwanda and volunteers/citizens with an interest in waterbird and wetlands conservation. This initiative was developed through a partnership between the Center of Excellence in Biodiversity and Natural Resource Management (CoEB) at University of Rwanda and Birding Education Tours (BET) Rwanda. These waterbird counts are part of the worldwide International Waterbird Census coordinated by Wetlands International. The collected data are published on an open website, as well as the Rwanda Biodiversity Information System (RBIS). The accessibility of the data allows scientists and policy makers from all over the world to monitor the vulnerability of lakes and wetlands within the country and make informed decisions about how to manage them in a sustainable way. Claudien Nsabagasani, from Birding Educational Tours Rwanda, is the country coordinator for Waterbird Counts in Rwanda. The Waterbird Count partnership includes Rwanda Environment Management Authority, Akagera Management Company, and Albertine Rift Conservation Society, as well as several other NGOs.

Photo: Gray- Crowned Crane by Dembo Jatta(left)and Waterbird counters during the field data collection (right).

Counting surveys aim to assess waterbird populations in Rwanda. A previous count was conducted in 2016, but due to the current threats, there is a need to up and expand available information about waterbird population trends within different wetland ecosystems in Rwanda. This information can serve as an early warning system for the detection of environmental change, which is especially for important for valuable freshwater ecosystems.

Waterbird counts were carried out in nine selected sites: Lake Ihema and Lake Mugesera in Eastern Rwanda, twin lakes Ruhondo and Burera and Rugezi wetland (a Ramsar site) in Northern Rwanda, and four urban wetlands in Kigali City including Umusambi Village, Gikondo wetland, Gatsata wetland and Nyandungu wetland (currently known as Nyandungu Urban Eco-tourism ParkThe counts conducted in 2021and 2022 were led by the CoEB and BET, with collaboration from Akagera Management Company, Nature Rwanda, Albertine Rift Conservation Society (ARCOS Network), Rwanda Wildlife Conservation Association (RWCA), International Union for Conservation of Nature (IUCN) and staff of BirdLife International). We thank the Direction of Rwanda Environmental Management Authority for the support and recommendation to run the counting in all selected sites.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

In the first count completed in June 2021, 48 waterbird species were recorded, of which 14 species are migratory. In the second count completed in February 2022, 57 waterbird species were identified. According to the IUCN Red List, the species recorded included 46 waterbird species of least concern, one near threatened (*Papyrus Gonolek*), and one endangered species (Gray-crowned Crane). The African Darter (*Anhinga rufa*) and the Great Cormorant (*Phalacrocorax carbo*) were the most common species recorded at lake Ihema in Akagera National Park with 345 and 271 individuals respectively. Lake Ihema covered more than half of all species recorded in all sites sampled during the count in 2022. Human activities that included habitat degradation (agriculture, grass cutting, infrastructures), noise pollution, and the overexploitation of resources are likely to be driving threats in the surveyed areas.

Prof. Beth Kaplin, the Director of CoEB, commented "We completed two counts so far in partnership with multiple institutions and individuals who volunteered their time for this work, and the aim is to make this an annual event so we can monitor wetland ecosystems and the avian biodiversity in these systems". In all, the collaboration of state, private, and local community governance of wetlands and protected areas is paramount for effective monitoring of conservation and ecosystem services.

Photo: Spur- Winged Goose, picture taken by Dembo Jatta (left)and Hamerkop, picture taken by Will Wilson (right).

Adaptive Planning Process (APP) Workshop and APP training in water resource management

CoEB is running a project entitled: "Unlocking Resilient Benefits from African Water Resources" founded by the African Research Universities Alliance Water Centre of Excellence (ARUA-Water CoE). This is a collaborative project between the CoEB based in the University of Rwanda, College of Science and Technology (UR-CST), and the ARUA-Water CoE based at Rhodes University, South Africa. For the implementation of one of the objectives of the project, the CoEB hosted a three-day (7-9 February 2022) Adaptive Planning Process (APP) Workshop with professionals working in Water Resource Management and a training with CoEB staff (office staff, research Fellow, and Associates) at the University of Rwanda, Huye campus.

Photo: Dr. Venuste Nsengimana, the PI for the ARUA project introducing the APP training workshop with CoEB staff (left). The Resident Principal of UR-Huye campus, giving opening remarks to workshop participants (right).

Day one of the training was opened by Prof Beth A. Kaplin. The training was facilitated by Dr Venuste Nsengimana, the Deputy Director of the CoEB and the PI of the project and assisted by Alphonse Nzarora (PhD student) and Venant Nzibaza (Research Assistant), as well as Dr Libala Notiswa and Dr Mathew Waiver from Rhodes University in South Africa. During this event, CoEB staff were trained in how to run an APP workshop where they learned how to identify issues stressing water catchments, and how to find solutions together as a team. They were introduced to information on how to formulate a shared vision, set the values, and contextual understanding of the catchment where the problem exists, keeping in mind the social, technical, economic, environmental/ecological, and political (STEEP) points of view. Additionally, they were trained on how to develop a hierarchy of set objectives.

Day one and two gathered together stakeholders in water resource management. The workshop was opened by the Principal of College of Arts and Social Sciences at the University of Rwanda, who is also the resident principal for the University of Rwanda, Huye campus and was facilitated by Dr. Venuste Nsengimana.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

During this training, the Nyabarongo and Akagera rivers were identified as water bodies that are stressed by different human activities, mainly agriculture. Using these rivers as examples, stakeholders followed the steps of the APP to (1) identify current stresses on these rivers, (2) formulate a shared vision, (3) state and set the values that will guide them to achieve their common vision, (4) develop a shared contextual understanding of the catchment, focusing on STEEP issues, (5) and formulate a hierarchy of objectives to reach their vision. Furthermore, they protoxidized the objectives and shared tasks that everyone will do to achieve stated objectives.

Stakeholders also discussed how to engage communities in the implementation process of the project. They specifically answered the following questions: (1) why is community knowledge important in water resource management? (2) what components of the hierarchy of objectives are critical for local community involvement? (3) how can local communities benefit from participating in this process?

These questions were answered in groups and feedback indicated that local communities should be included in the project from the early stages as they the ones living in the area, and hence affected by the status of the environment where they live. Additionally, as they have specific knowledge of the area they can inspire and guide the implementation of the project. Besides ecological benefits, local people may also benefit from jobs that generate income for them and the social self-esteem.

Photo: Alphonse Nzarora presenting his workshop group assignment (left) and participants during an ice breaker activity (right).

Rwanda Biodiversity Information System for sustainable development and climate change adaptation in Rwanda

The Rwanda Biodiversity information system (RBIS), an open Web-based Portal was established to mobilize biodiversity occurrence records to contribute to and assist policy development as well as the Decision making for the conservation and management of Rwandan ecological systems.

Currently, 112,000 biodiversity occurrence records have been mobilized, which includes data on fish, macroinvertebrates, amphibians, adult odonates, plants and birds. Additionally, the team is continuing to mobilize data sets, and cleaning and standardizing specific data on orchids, mammals, butterflies, ants, and reptiles in Rwanda which will either be added to corresponding modules or used to create new ones.

For the first time, the RBIS data were cited in the **Status of Environmental Outlook** report produced by the Rwanda Environment Management Authority. The Team continues to collaborate with stakeholders especially key data holders to bring all on board to share their data and use it for data products.

To address some of the stakeholder recommendations about data sharing, a user-friendly mobile application is being developed to assist the provision of data being collected by citizens. This is being developed by a team of University of Rwanda IT students as an internship project.

The RBIS team will also incorporate meteorological data and water quality data to the system, as well as data related to biodiversity identification such as animal calls, starting with bird sounds as this is being initiated by the Planet Birdsong Foundation, a small UK NGO aimed at generating Rwandan-led citizen science and academic bioacoustics to collect examples of bird songs and calls for the entire Rwanda Bird List in a form that is accessible to all. We will then continue this initiative into other taxa such as amphibians and mammals (e.g., bats).

For the project sustainability, the RBIS works hard to train young people and develop a community of practice to assist in the management of biodiversity data. The RBIS team thanks everyone involved in the development of the system through data sharing and continues to request data holders to share their data to be put in use.

Photo: University of Rwanda student interns involved in various activities including sampling wildlife species and lab treatment of samples.

What did Geospatial Analytics Training Course bring to the young researchers?

The 4-day Geospatial Analytics Training Course was held with funding from the Cleveland Metro Parks Zoo and technical support from experts from the University of Würzburg, GIS and Geodata4Africa, in a collaboration between the CoEB, and The Dian Fossey Gorilla Fund International (DFGI). The Training Course took place at the new DFGI - Ellen DeGeneres Campus in Kinigi, Musanze District, from the 15-18 March 2022.

The course was designed to ensure continuity of capacity building in geospatial analytics among African professionals by integrating a training for future trainers and creating a platform for a 'community of practice' in geospatial analytics. The course targeted practitioners in conservation-related fields with basic knowledge in geospatial analysis who already use or aim to integrate geospatial analytics into their work as well as current and future trainers in geospatial analytics.

In total 24 participants including four trainers attended the course. Only five participants among the attendees were female which marks a clear gap for women to engage in GIS careers.

Participants learnt the full process of designing and implementing satellite-based monitoring approaches in the context of global change like field work and data sharing. The course included one day of field excursion in the Volcanoes National Park to practice geospatial data collection with dedicated devices and the import of field data of various formats into GIS software for data analysis and creating maps.

Attendees were given knowledge about satellite missions and sensor types, data gateways, introduction into GIS software, Vector analysis, Raster analysis, EO project design, e.g., design your own field campaign, data integration and pre-processing and Analysis of field work and intersection with environmental remote sensing data.

Olive Umutesi, a Master student at University of Lay Adventists of Kigali (UNILAK) in Environmental Science and Development studies, option Environmental Economics and Natural Resource Management, said that she got so much knowledge from the training and is now able to use QGIS Software. "From the training, I got much knowledge about QGIS Software, how to use preprocessing, how I can get data from google if I want to use them in QGIS, I know well difference between Raster and vector and where we use it. I also learned how image from remote sensing can be analyzed and interpreted" Olive Umutesi said.

Obed Bimenyimana is a CoEB research fellow. He works with Rwanda Biodiversity Information System (RBIS). He shared with us the experiences he profited from in the training too. "Geospatial analytics training was fruitful through the concepts we learned during the training especially for GIS user in their daily life for example we learned the Image classification, satellite mission sensors types and data integration and pre-processing" Obed Bimenyimana said.

Photo: Geospatial Analytics Training Course participants and trainers.

Participants' recommendation is that these training need to happen several times for building capacity development for young generation. They keep insisting that the training was interesting and informative but that the time for practice was too short.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

EDUCATION &AWARENESS RAISING

7	6	13	22	5	3
Graduate students supported	Trainings conducted	Seminars hosted	Academic interns	Professional interns	Community Outreach activities

CoEB Seminar Series highlights

Continuing to engage students, researchers, and professionals from around the world, the CoEB seminar series hosted a diversity of topics from January – March this year. 12 seminars were provided in these three months with 20-50 people attending each time. CoEB seminar presenters included Prof. Beth Kaplin who presented on "Making it through 2021 for biodiversity, climate adaptation and natural resource management at the Center of Excellence in Biodiversity and Natural Resource Management"; Yves Rugira , Radio Presenter at Radio Salus, who presented on "How is the Media reporting on biodiversity conservation?"; Johan Uddling, University of Gothenburg/Sweden, who presented on the "Challenges and opportunities for native tree species use in agroforestry and forestry in Rwanda"; and Dr. Venuste Nsengimana who presented on "Diversity and abundance of soil-litter arthropods and their relationships with soil physicochemical properties under different land uses in Rwanda".

Other seminars were provided by Jean Damascene Gashumba, Executive Director of Rural Environment and Development Organization (REDO) who presented on "Ibanda –Makera natural forest sustainable conservation for livelihood improvement and community resilience to climate change". Leonrad Iyamuremye, who is an independent conservationist and Youth4nature Ambassador, presented "Connecting Youth with Biodiversity Conservation". Melanie Surchat a PhD Candidate at Swiss Federal Institute of Technology, Switzerland, presented on "Biowaste economy in Rwanda: what is there? What does it mean for the female and male workers?". Eric Bizimana, water conservation officer at Rwanda Water Resource Board (RWB)offered a presentation on "Assessing and mapping of soil erosion using RUSLE Model in Gishwati -Mukura Landscape, Rwanda". Dr. David L. Waldien, IUCN Bat Specialist Group – Old World Bat Coordinator, Prof. Gregory Setliff, Lecturer at Kutztown University, Department of Biological Sciences and Dr. Monika Bohm, IUCN, Global Center for Species Survival – Freshwater Coordinator together presented on "Approaches to the Establishment of a Red List Node in Rwanda". Video recordings of the CoEB Seminar Series can be accessed at our Youtube channel here: https://www.youtube.com/channel/UCdr8ykoxB00DI7ywxpvBuWA

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

Rwanda's wetlands conservation: A webinar organized in line with the celebration of the World Wetland Day 2022

Example of a restored wetland in Rwanda (Rugezi wetland), the only Ramsar wetland in Rwanda that has been restored in 2004. Photo by Prof. Elias Bizuru.

The World Wetlands Day is celebrated every year on 2 February. Its aim is to raise the global awareness about the vital role of wetlands for people and the planet. This day also marks the date of the adoption of the Convention on Wetlands signed on 2 February 1971 in Ramsar city, Iran. The CoEB hosted a webinar to discuss the current status of wetlands conservation in Rwanda, and to explore the challenges and opportunities.

The webinar took place on 2 February 2022 with six speakers from three institutions. These were Mr. Alphonse Nzarora (Research Assistant for the UKRI-funded ARUA Water CoE project titled 'Unlocking Resilient Benefits form African Water Resources' [RESBEN] https://www.ru.ac.za/iwr/aruacoe/ and Assistant Lecturer at the University of Rwanda), Professor Elias Bizuru (Research Associate of the CoEB and lecturer at the University of Rwanda), Mr. Jean Ferus Niyomwungeri (Community Conservation Programme Manager at Rwanda Wildlife Conservation Association), Dr. Deo Ruhagazi (Senior Programme Manager and Veterinarian at Rwanda Wildlife Conservation Association), Mrs Christelle Suavis Iradukunda, (Bugesera Landscape Manager at Albertine Rift Conservation Society, ARCOS) and Mrs Brigitte Kanyamugenge (Head of Community Development Programme at ARCOS). The webinar was attended by 104 participants and took place on google meet. Participants came from different disciplines across the planet. The recording of the webinar can be found here.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

Mr Alphonse Nzarora in his presentation stressed the importance of using biological indicators in water quality monitoring. He specified that one of the benefits of the use of bioindicators is their ability to indicate some of the indirect effects of pollutants that cannot be indicated by physical and chemical measurements. He also added that biological assessment of water quality is comparatively cost-efficient and requires basic equipment compared to the use of physicochemical properties. He concluded that biological indicators could be an answer where financial limitations are an issue for monitoring water quality.

Prof. Elias Bizuru presented about the sustainable use of wetlands in Rwanda. He highlighted different ecosystem services provided by wetlands and mentioned some of the opportunities and challenges faced by wetland conservation in Rwanda. The opportunities include the availability of water for irrigation and the rich biodiversity while challenges include invasive species and pollution from inorganic pollutants from agriculture.

Mr. Christelle Iradukunda and Mr. Brigitte Kanyamugenge presented about the efforts made by ARCOS to restore the Amasangano wetland located in the Eastern Province of Rwanda. The Amasangano wetland is located at the confluence between the Akanyaru and Nyabarongo Rivers. The Amasangano wetland has recently been impacted by unsustainable agriculture, invasive species, unsustainable fishing, and clay extraction quarries. Additional challenges in the area include droughts and floods, however, alternative economic opportunities include tourism

Mr. Jean Ferus Niyomwungeri and Mr. Deo Ruhagazi shared a pre-recorded video about the work of RWCA to protect wetlands that are home to the endangered grey crowned crane. According to the video shared during the webinar, RWCA has restored Umusambi village, a privately owned touristic wetland located at Kabuga, in Kigali city. The restored wetland is now home to the cranes which have almost doubled in Rwanda in recent years from 487 in 2017 to 997 in 2021.

In the open discussion, Dr. Deo Ruhagazi explained how wetlands in Rwanda are divided into three classes, those that are (1) fully protected, (2) conditionally used, and (3) unconditionally used. Fully protected wetlands are only for conservation and no activity should take place there except conservation activity. Wetlands which are used conditionally can be used for limited activities such as organic agriculture while wetlands which are used unconditionally can be used for any activity according to preferences of the owner. Please watch the webinar recording here.

World Water Day- Making the invisible visible

In line with World Water Day celebrated every year on 22 March, the CoEB organized a webinar to honor this day and this year's theme is Making the invisible visible, with a special emphasis on the importance of groundwater, which accounts for nearly 99% of the freshwater on the planet.

Groundwater provides half of the water used for domestic use by the global population, including drinking water for the vast majority of the rural population that is not connected to supply systems. About 25% of irrigation water is groundwater. Nevertheless, according to the UN, the importance of this natural resource is often undervalued and poorly understood, as well as mismanaged and abused. According to the United Nations Water and Climate Coalition, it is only through sustainable management that it is possible to provide drinking water, a precious resource, to future generations.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

National Herbarium of Rwanda

On 23 – 25 February, the National Herbarium of Rwanda (NHR) hosted three botanists from Spain with the goal of finishing the drying and preparing of specimens to take to Spain and leave in NHR. Samples were collected in Gishwati and Nyungwe National Parks. This visit provided a staff at NHR a great opportunity to be trained in plant identification techniques. The group from Spain are planning to hold an online seminar for the University of Rwanda community, both students and professors, to discuss their project and the results obtained after their data collection in Rwanda.

On 3 January- 3 February the NHR trained eight students from College of Agriculture and Veterinary Medicine at UR. They were trained on the daily activities that take place in NHR to familiarize them with techniques and protocols.

On 5 February the NHR was privileged to receive a group of 15 Rwanda University for Conservation of Biodiversity (RUCCB) members. The aim of their visit was to explore ways in which they can use the herbarium in their studies and benefit from the wealth of information and resources it provides.

Photo: botanist from Spain and herbarium staff doing identification (left) and student interns doing plant collection on field (Right).

The NHR strives to support plant biodiversity science and conservation and provide resources that can empower individuals and institutions to make science-driven decisions for environmental sustainability. The NHR provides valuable data regarding the botanical biodiversity of Rwanda and the Albertine Rift region for present and future generations.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

On 31 August 2020, the University of Rwanda joined the African Institute for Indigenous Knowledge Systems (AIIKS) with CoEB as the focal point. The AIIKS is established at the University of KwaZulu-Natal (UKZN), South Africa. AIIKS is established based on the Hub and Spokes model. The institute will develop and drive strategies for the systematization of African indigenous knowledge as a knowledge domain in its own merit. The University of Rwanda, as a prominent institution within the continent, has expressed interest and a commitment towards the advancement of AIIKS. The involvement from UR will be through the following channels: CoEB, Huye Biotechnology Laboratory, and The Center for Conflict Management (CCM). The CoEB's area of focus will be on traditional knowledge systems, biocultural diversity, and bio-prospecting and Dr Nathan Taremwa is the lead contact for the AIIKS activities at CoEB.

The African Institute in Indigenous Knowledge Systems rotates chairs among member institutions for its quarterly management meetings. On 25 February 2022, the University of Rwanda hosted the quarterly management meeting and the CoEB served as the chair.

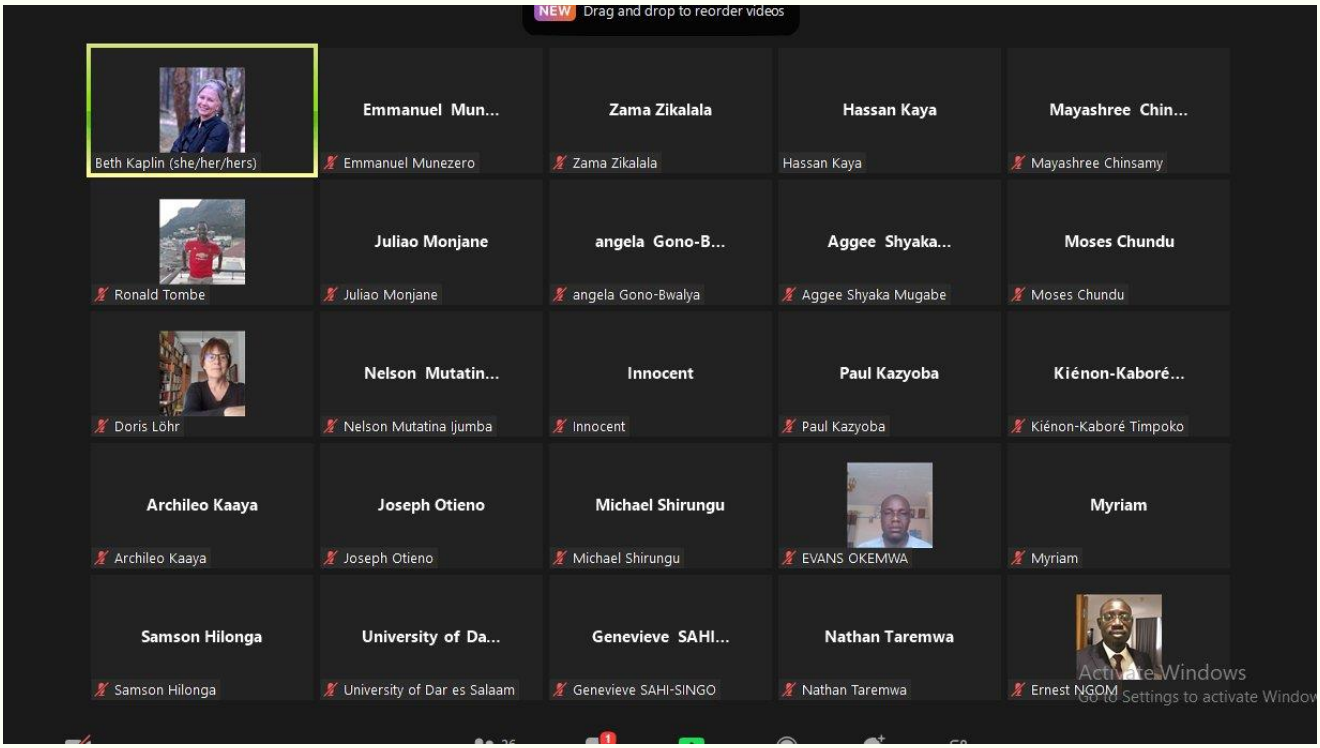

Photo: Sceenshot showing the AIIKS meeting participants on 25 February 2022.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

International Gorilla Conservation Programme (IGCP) Conducted a Social Assessment of Protected Areas (SAPA) in the Volcanoes National Park (VNP)

The Social Assessment of Protected Areas (SAPA) is a multi-stakeholder methodology that seeks to understand the positive and negative impacts of conservation and related development activities of protected areas on the wellbeing of local people from the perspective of local communities living around protected areas. Its goal is to enable park managers and stakeholders to increase and more equitably share the positive social impacts and to reduce the negative social impacts of conservation.

SAPA methodology was first introduced in Mountain Gorilla parks in 2019 in Mgahinga Gorilla National Park (Uganda) with support from Flora and Fauna International (FFI). After, its successful implementation, IGCP took the lead and proceeded to its roll out in Bwindi Impenetrable National Park (Uganda) in 2020.

The roll out of SAPA Volcanoes National Park (VNP) started in November 2011 with an inception meeting that gathered different key park stakeholders including local government at District and Sector levels, conservation NGOs, local community-based organization and private sector. In February 2022, SAPA process continued by conducting first community meetings where 3 community meetings were conducted in Burera, Musanze and Nyabihu and were attended by 90 community members equally split between genders. During those community meetings, community members identified and ranked key positive and negative impacts of the park on their wellbeing.

Some of the key positive impacts of the VNP that were identified included: community development projects, safeguarding and making the Rwandan culture known to foreigners, protection against soil erosion, and infrastructure development. On the other hand, identified negative impacts included: wild animal crop raiding and destruction of property, human injury and death, lack of compensation for the land in the park's buffer zone, and the delay and inadequate compensation for damages caused by wild animals. All identified positive and negative impacts were presented in a stakeholder workshop conducted on 9 February 2022 for further discussion and validation.

As the SAPA process moves forward, selected top ten positive and negative impacts, along with protected area governance assessment questions will be assessed in a household survey. A number of households will be surveyed to gain more understanding on how selected impacts affect local communities around VNP. Data will be analysed and results will be presented to local communities and stakeholders for discussion, interpretation, and validation at a second community meetings and stakeholder workshop. To culminate this, an action planning meeting will be conducted where different stakeholders will identify key activities to reduce negative social impacts of VNP and increase and equitably share positive impacts. The main focus of this action planning step will be to ensuring that existing planning processes of VNP management and other key actors take on board some of the ideas for action.

Our growing CoEB community includes staff, UR associates, research fellows and affiliates, and professional and academic interns. Taking a multidisciplinary approach, the Center intentionally brings together different disciplines, academic fields, and youth to solve conservation and sustainability issues within Rwanda and the region.

Anti-Idling Education Campaign in Rwandan schools

Photo: Students informed parents that it is better for the air they breathe to turn off engines

Engine idling is any time your car engine is running but you're not moving, usually for more than 10-20 seconds. e.g. waiting at school pick-up and drop-off areas. Health: Idling makes for worse air quality, which is bad for human health. Environment: When an engine is running, it emits carbon dioxide (CO_2) responsible for climate change.

Children are particularly vulnerable to air pollution because they breathe faster than adults, their lungs are still developing and inhale more air per kilogram of body weight. Exposure is linked to adverse health outcomes, including increased respiratory symptoms, absences from school, impaired lung function and decrease children's academic performance.

Dr Egide Kalisa, Research Associate at CoEB is conducting an investigation of children's exposure to air pollution while at school and how to reduce those exposures. He conducted a campaign with school children in Rwanda to ask the school community and parents to stop needless idling.

Photo: Students learning about air pollution monitoring. Here students are checking out a black carbon monitor, Dr Egide Kalisa installed at school to examine indoor and outdoor school environments

Congratulations to a CoEB Research Affiliate Dr. Amanda Tokash-Peters, for her publication!

Photo: Culex Lighting ATPScope

CoEB affiliate Dr. Amanda Tokash-Peters, student mentees, and colleagues at University of Massachusetts - Boston (UMASS Boston) recently had their article, "Trans-generational symbiont transmission reduced at high temperatures in a West Nile virus vector mosquito *Culex quinquefasciatus*" accepted in the journal *Frontiers in Tropical Disease*. Their paper looked at the effect of temperature on the abundance of *Wolbachia* bacteria, which has been utilized as a novel method of biological mosquito control. Their study has implications for whether this microbial method of vector-borne disease control could be effective in different regions and under various climate scenarios. Dr Tokash-Peters conducted research on this topic during her PhD studies at UMASS Boston.

https://www.frontiersin.org/articles/10.3389/fitd.2022.762132/abstract

The Dian Fossey Gorilla Fund occupies its new facilities for conservation and research

After nearly four years of construction, the Dian Fossey Gorilla Fund finally moved to its new home on the Ellen DeGeneres Campus. This state-of-the-art facility offers unparalleled opportunities for conservation, research, and education. It allows a broad audience, from primary schools to visiting tourists, to learn about gorillas, their ecosystem, and the plight of conservation; fueling the inspiration to engage in science and/or conservation. The facilities also enhance scientific output (in quantity, quality, and variety) and allows for strong collaborative research efforts (with e.g., the CoEB) as well as more effective and encompassing student mentoring. You are all welcome to visit!

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

Congratulations to a CoEB Research Associate Dr. Myriam Mujawamariya, for winning OWSD award for Climate Action and Environment!

Dr. Myriam Mujawamariya is helping Rwanda to prepare for climate change by studying how various types of indigenous trees respond to different climate scenarios. Erosion is a major environmental concern in Rwanda, and many efforts are being put into landscape restoration and ecosystem-based adaptation. However, greater knowledge is needed about how trees will respond to higher temperatures and other climatic changes, as well as which trees can best support ecosystem services such as soil stabilization, climate regulation, biodiversity, and bioenergy. Dr. Mujawamariya tested the physiological responses of 20 native species grown at three sites along an elevation gradient, to simulate different climate change scenarios, using the unique Rwanda Tropical Elevation Experiment, Rwanda TREE project (see www.rwandatree.com).

The project will contribute to understanding of how climate change will influence tropical forest cover, carbon sequestration and biodiversity not only in Rwanda, but in all of Africa's Western Rift Valley region and beyond.

Dr. Mujawamariya is a member of the Association for Tropical Biology and Conservation and is a Research Associate at CoEB.

She has won numerous grants for her work, including the Belgian ARES grant, and grants from the Rwanda National Council of Science and Technology (NCST), the Swedish International Development Cooperation Agency (Sida).

She has participated in many community outreach activities through the University of Rwanda and CoEB to raise awareness for biodiversity conservation, including educating school children about environmental protection.

Myriam is now a working on Promoting Indigenous Trees for Timber Industry In Rwanda (PITTIR) as a CO-PI researcher, a project which received a National Council for Science and Technology (NCST) academia-industry grant to contribute to national priorities for reforestation, food security, and biodiversity conservation by identifying a suite of indigenous tree species that meet industry requirements for commercial production and contribute to human wellbeing.

Advocate, promote, educate, and raise awareness about biodiversity, natural resource management, science-policy linkages, knowledge management, and sharing mechanisms.

Center of Excellence in Biodiversity and Natural Resource Management

The Government of Rwanda is committed to Centers of Excellence that will ensure research is available to meet national data needs for evidence-based decision making. University of Rwanda hosts several Centers which drive academic research, training and innovation in support of policy and management. The CoEB was formally established at University of Rwanda in 2016 and works across Colleges, Schools and departments. It engages with environmental scientists, biologists, social scientists, policy scientists, gender experts, ecological economists, anthropologists, chemists, pharmacists, molecular biologists, foresters, agronomists, climate scientists, and many others. The Center functions as a consortium of institutions, known as nodes, and works with youth and elders, with government and private sector, communities, practitioners, NGOs and international partners to meet its mission.

We are developing opportunities for youth and early career researchers to gain experience, we provide data for decision-makers, we are creating an academic & research culture, and making it enjoyable. We are creating a dynamic and welcoming atmosphere for academics and practitioners, we want science and research to be exciting and rewarding, and we are driven to contribute to sustainable development goals and achievement of climate resiliency and biodiversity conservation for Rwanda and the region.

Contact us!

www.coebiodiversity.ur.ac.rw CoEB Rwanda @coerwanda coeb1@ur.ac.rw +250786470049