

APRIL 2026 ISSUE

CoEB NEWSLETTER

RWANDA BIODIVERSITY CHRONICLE

Insights in Biodiversity Conservation and Research Advancement

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Written by: CoEB Team



Assoc. Prof. Venuste Nsengimana, CoEB Director

DIRECTOR'S MESSAGE

It is my pleasure to present the February-April edition of our newsletter, highlighting recent scientific and institutional progress at the Centre of Excellence in Biodiversity and Natural Resource Management (CoEB). This period reflects a sustained effort to advance the understanding of the biodiversity of Rwanda through research, hands-on conservation practices, seminars, and scientific publications. These activities are strengthening a reliable evidence base to guide conservation and sustainable natural resources management. None of these achievements would have been possible without support and collaboration with our partners. Through ongoing conservation efforts, the CoEB is also making significant progress in strengthening the National Herbarium and the National Zoological collections, which have reached new milestones with the addition of new specimens. As we move forward, we remain committed to promoting research-driven solutions to community and biodiversity.

Advancing Biodiversity Monitoring through Environmental DNA in Volcanoes National Park



Group photo of eDNA participants at Ellen de Geners campus of Dian Fossey

The training workshop on environmental DNA (eDNA) monitoring was conducted from 9 to 13 February 2026 at the Dian Fossey Gorilla Fund Campus in Kinigi, Musanze District. The programme introduced conservation professionals to molecular approaches for biodiversity assessment. Participants were trained in eDNA sampling protocols, DNA extraction, and bioinformatic interpretation to enhance identification of species, particularly cryptic and rare taxa. For the Center of Excellence in Biodiversity and Natural Resource Management, this training is a strategic investment aligned with its mandate in biodiversity research. The approach supports the existing biodiversity sampling techniques. Although this approach has not yet been integrated into routine research, the initiative marks an important step in building institutional capacity.



Field Collection of Environmental DNA (eDNA) Samples

Development the Resettlement Action Plan (RAP) for Kayonza Irrigation Sites



During the development of the Resettlement Action Plan (RAP) for Kayonza Irrigation and Integrated Watershed Management Project Phase II, implemented by the Rwanda Agriculture and Animal Resources Development Board, the Centre of Excellence in Biodiversity and Natural Resource Management provided technical support for the implementation of the project. From 22 to 27 February 2026, site visits were conducted at Ndego, Kanyeganyegye, and Gishanda irrigation sites to ensure that the RAP reflects actual conditions on the ground. These visits enabled the collection and verification of environmental and socio-economic data, alongside the recording of geospatial coordinates to ensure accurate site referencing. The collected information was used to refine key components of the RAP, including compensation measures, livelihood restoration options, and grievance management processes. Following the fieldwork, all site-specific data were reviewed, harmonized, and validated to ensure accuracy and consistency. This process strengthened the quality and reliability of the RAP, supporting informed decision-making and effective implementation of the project.

Advancing Sustainable Development Capacity through International Academic Collaboration



A five-day intensive training programme on sustainable development was delivered from 16 to 20 March 2026 at Nyarugenge Campus through a partnership between the University of Rwanda - Centre of Excellence in Biodiversity and Natural Resource Management and Columbia University, engaging undergraduate students from both institutions. The programme combined classroom-based learning with field exposure, including a study visit to Akagera National Park. The training strengthened analytical and practical competencies while fostering international academic exchange and reinforcing capacity for evidence-based sustainable development practice.

Advancing Ecosystem Restoration through Sustainability Science Training

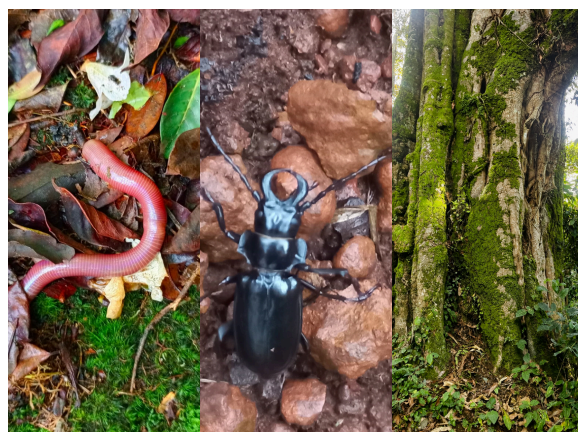


A training on Sustainability Science in Practice was organized by the Centre of Excellence in Biodiversity and Natural Resource Management in collaboration with Leuphana University (Germany), focusing on the application of social-ecological systems approaches to ecosystem restoration in rural Africa. The programme featured expert-led sessions on sustainable agriculture land use, biodiversity conservation and ecosystem functioning, ecosystem restoration, and community engagement, through interactive discussions and scientific presentations, strengthening the understanding of interdisciplinary approaches to biodiversity conservation and the integration of ecological and social dimensions in environmental management.

Community-Based Biodiversity Conservation



The team from the Centre of Excellence in Biodiversity and Natural Resource Management participated in community consultations and participatory workshops on biodiversity management from 23 to 27 March 2026 in Rongi Sector Muhanga District. The workshop involved direct interaction with local communities to document traditional ecological knowledge, identify key biodiversity species, and discuss sustainable forest management practices. This workshop enhanced participatory conservation approaches, while strengthening collaboration between researchers, local communities, and environmental authorities towards improved biodiversity conservation and support the integration of local knowledge into conservation planning.



Examples of biodiversity observed in Busaga forest

Integrating Indigenous Knowledge and Frontier Technologies for Sustainable Agriculture

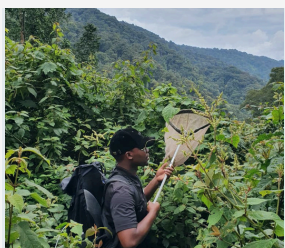


From 13–18 April 2026, a field research was conducted in Kayanza and Kirehe districts to explore the integration of African Indigenous Knowledge Systems (AIKS) with emerging agriculture technologies. The activity brought together researchers, and farmers to document traditional farming practices, assess the adoption of modern technologies, and examine how local knowledge systems shape agriculture resilience. The study focused on key areas including indigenous food processing methods, agroforestry practices, knowledge transmission through local languages, and the role of community-based philosophies in sustainable development. Findings from this research are expected to generate evidence-based insights to inform policy, strengthen inclusive innovation, and support the development of resilient and sustainable agricultural systems in Rwanda.

Scientific Research Seminars and Knowledge Sharing

The Centre of Excellence in Biodiversity and Natural Resource Management keeps leading seminar series presentation to serve dynamic platform for knowledge exchange, bringing together researchers, practitioners, and international experts to share cutting-edge insights in biodiversity conservation, and sustainable development. The seminar series highlighted diverse approaches in ecology, molecular and policy relevant research for biodiversity conservation and natural resource management.

DISTRIBUTION OF FLIES (INSECTA: DIPTERA) ACROSS ALTITUDINAL GRADIENT IN NYUNGWE NATIONAL PARK, SOUTH-WESTERN RWANDA



On 11 February 2026, Jean de Dieu Nsenganeza, a Research Fellow at Centre of Excellence in Biodiversity and Natural Resource Management, presented findings on the diversity and distribution of Diptera across the altitudinal gradient in Nyungwe National Park. Data were collected using the pan traps and sweep nets across six sampling locations in low, mid, and high altitudes. Results have recorded 691 individuals classified into 36 families. Results has revealed also statistically significant differences in abundance across altitudinal zones ($P < 0.05$), with peak assemblages observed at mid-altitudes (2100–2500 m) under open canopy. This research has demonstrated the ecological importance of Nyungwe National Park to host biodiversity of Diptera flies.

TOWARDS MULTIFUNCTIONAL RESTORATION IN RWANDAN LANDSCAPES: A LIVING LAB APPROACH TO SCIENCE AND PRACTICE



Multifunctional ecosystem restoration is increasingly recognized as critical for addressing land degradation, biodiversity loss, and livelihood challenges in rural landscapes. In this context, on 22 April 2026, Dr. Apollinaire William (Leuphana University; Leibniz Centre for Agricultural Landscape Research) presented a Living Lab approach applied in western Rwanda, which integrates scientific research with community-driven practice. The approach emphasizes co-creation by engaging stakeholders in participatory planning, demonstration sites, and adaptive experimentation, structured around key components including site selection, experimental design, species trials, and monitoring. By combining ecological and governance perspectives, it generates scalable and context-specific restoration strategies that support more sustainable and resilient socio-ecological systems.

CIRCULAR FOOD SYSTEM: A PATHWAY TO CLIMATE CHANGE MITIGATION AND CLIMATE-SMART AGRICULTURE – A CASE STUDY OF RWANDA



Presented on 18 February 2026 Taifa Steven presented a Circular Economy Consultant working with MDF Global and GIZ, the study examined the transition toward circular food systems in Rwanda using a mixed-methods approach combining surveys of 150 agribusinesses and cooperatives with stakeholder interviews. The findings demonstrated that nutrient recycling and agricultural waste valorization can reduce dependence on synthetic inputs by approximately 30%, while improving soil organic carbon. Given that food systems contribute substantially to greenhouse gas emissions, the findings position circularity as a practical pathway for climate-smart agriculture. The study further underscores the role of integrated resource-use strategies in strengthening sustainability within agri-food systems of Rwanda.

ECOFREST: TREE-LEVEL DIGITAL MRV FOR AGROFORESTRY, BIODIVERSITY, AND CLIMATE FINANCE IN RWANDA



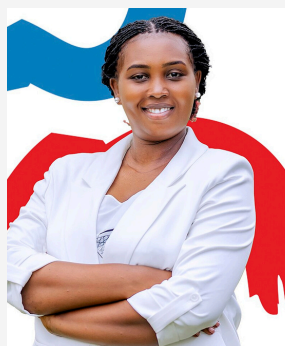
Focusing on digital innovation in environmental monitoring, a seminar delivered on 25 February 2026 by Kristian Gasaro, founder of ISARO Econext, introduced Ecoforest, a tree-level digital Monitoring, Reporting, and Verification (dMRV) system designed to improve transparency in restoration and agroforestry programmes. The platform integrates georeferenced field data, real-time analytics, and standardized reporting to track tree survival, growth, and ecosystem outcomes. The system addresses critical gaps in long-term monitoring and reduces uncertainty in assessing restoration success. The approach enables improved accountability for climate finance mechanisms and supports adaptive management of restoration initiatives.

THE ROLE OF NATURAL COLLECTIONS IN BIODIVERSITY CONSERVATION: LESSONS FROM THE RWANDA NATIONAL ZOOLOGICAL COLLECTION



A seminar delivered on 04 March 2026 by Constantin Sibomana, Curator of the Rwanda National Zoological Collection (RNZC), presented the collection as a growing national repository comprising 20,879 specimens grouped into 13 taxonomic groups, including both legacy and newly curated material, with a dominance of insects (17,021), arachnids (1,787) and crustaceans (906) while vertebrates remain less represented. Recent collection efforts have increased the number of specimens to 12,335 in 2025 with 7,731 sampled in 2026. Persistent challenge is the small number of specimens identified to species level (approx. 424 equivalent to 2%) due to the lack of experts in animal taxonomy.

CONNECTING KNOWLEDGE FOR NATURE: USING WIKIMEDIA PLATFORMS TO BRIDGE BIODIVERSITY KNOWLEDGE GAPS



Focusing on digital innovation in environmental monitoring, a seminar delivered on 29 April 2026 by Rebecca Jeannette Nyinawumuntu, founder of Eco Mappers OSM Rwanda and co-founder of Wikimedia Rwanda, she presented how open knowledge platforms can help bridge biodiversity information gaps. The presentation highlighted the use of Wikispecies, Wikidata, and Wikisource to support species documentation, data validation, and science communication. Drawing on practical experience from Rwanda and the African Great Lakes region, the seminar showed how these tools can enhance the visibility and accessibility of local biodiversity data for research and learning. The approach provides a cost-effective mechanism for strengthening collaboration, improving public access to biodiversity information, and increasing the impact of scientific research and conservation efforts.

DO REMOVAL STRATEGIES MATTER? EVALUATING INVASIVE SPECIES MANAGEMENT FOR NATIVE PLANT COMMUNITY RECOVERY



Invasive plant species are widely recognized as a major constraint on forest restoration. In a seminar delivered on 11 March 2026, Blaise Binama (PhD), a postdoctoral researcher from Georg-August University Göttingen, presented findings from experimental work in the montane of Rwanda assessing the effectiveness of contrasting removal strategies on native plant recovery. Using a randomized block design, the study compared species richness and seedling performance across treatment conditions. Results indicated that intact native plots support the highest diversity, while unmanaged invaded plots remained species poor. Effective invasive removal led to measurable recovery of native richness, whereas inadequate removal combined with planting yielded limited ecological gains. Species-specific responses were also observed, with *Croton megalocarpus* showing significant growth under effective removal, while *Newtonia buchananii* exhibited minimal response. These results underscore that successful restoration depends primarily on the effectiveness of invasive species suppression, and that planting alone cannot compensate for insufficient removal, highlighting the need for integrated and evidence-based restoration strategies.

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NAVIGATING BOUNDARIES: THE INFLUENCE OF PHYSICAL BARRIERS ON CARNIVORE MOVEMENT AND HUMAN–CARNIVORE COEXISTENCE AND CONFLICT



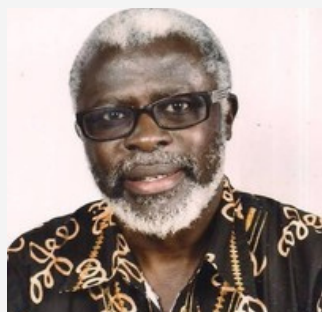
Human–carnivore interactions remain a key challenge in protected areas. In a seminar delivered on 18 March 2026, Ms. Meghan Hills (University of Wisconsin–Madison) presented a pilot study findings around Akagera National Park examining how electric fencing influences carnivore movement and conflict. Using camera traps, farmer interviews, and compensation records, the study assessed both ecological patterns and community experiences. The findings show that while fencing alters movement behavior, it does not eliminate interactions, with conflict dynamics shaped by both environmental factors and human responses. The study highlights the limitations of relying solely on physical fences and emphasizes the need for integrated approaches combining ecological monitoring with community-based mitigation strategies.

PLOT-LEVEL TREE DENSITY AND LANDSCAPE COMPOSITION INTERACT TO DRIVE ARTHROPOD ACTIVITY-DENSITY, BUT NOT TAXONOMIC RICHNESS IN TROPICAL SMALLHOLDER AGROFORESTRY



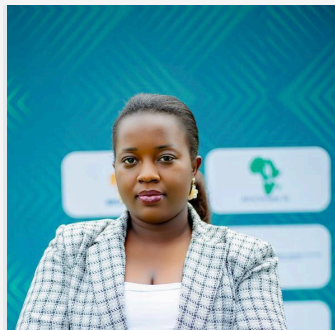
Interactions between local and landscape-scale factors play a critical role in shaping biodiversity within agroecosystems. In a seminar delivered on 25 March 2026, Dr. Jean Aimé Ruticumugambi (Yale University) presented findings from a study of 80 smallholder agroforestry plots in Eastern Rwanda examining how tree density and surrounding land-use influence arthropod communities. The results show that arthropod activity-density varies significantly with both plot-level tree density and landscape composition, with distinct responses across functional groups, while overall taxonomic richness declined with increasing surrounding forest cover. The study highlights the importance of structural complexity in agroforestry systems and demonstrates how landscape configuration influences ecological processes relevant to biodiversity conservation and agricultural sustainability.

A GUIDE TO AFRICAN TRADITIONAL MEDICINE: TOWARD HOLISTIC HEALTHCARE



Indigenous knowledge systems remain central to understanding the links between biodiversity and human well-being. In a seminar delivered on 01 April 2026, Prof. Humphrey Jeremiah Ojwang (Muhimbili University of Health and Allied Sciences) presented the role of African traditional medicine within holistic healthcare systems. The presentation outlined key stages in the development and application of traditional medicine, including discovery, testing, and formulation, emphasizing its scientific and cultural relevance. The discussion highlighted the importance of integrating indigenous knowledge into modern frameworks to strengthen healthcare systems while supporting biodiversity conservation and sustainable use of natural resources.

INTEGRATING HERBARIUM DATA AND DNA BARCODING TO IDENTIFY AND CONSERVE RARE PLANT SPECIES IN RWANDA



Combining classical and molecular approaches is increasingly important for accurate biodiversity taxonomy. In a seminar delivered on 15 April 2026, Aimee Sandrine Uwase, Curator of the National Herbarium of Rwanda, presented the work on integrating herbarium records with DNA barcoding to improve identification and conservation of rare plant species. The study demonstrated how herbarium data provides historical and spatial information, while DNA barcoding resolves taxonomic uncertainties and detects hidden diversity, particularly in orchids. The approach enhances species identification and distribution mapping, supporting more robust, evidence-based conservation planning. This integration is critical for addressing under-documented plant diversity and strengthening national capacity to monitor and conserve rare and threatened species.

Publications

1. Bladon, A. J., Akite, P., Chowdhury, S., Riva, F., Cooke, R., Dyer, E. E., ... & Dicks, L. V. (2026). Global Biodiversity Framework targets can drive action on insect declines, but lack robust indicators to prove their effectiveness. *Conservation Letters*, 19(2), e70025. [Read more](#)
2. Twagirayezu, E., Kirkaldy, A., Ndatimana, G., Seresinghe, A., Mindje, M., Sibomana, C., ... & Nsengimana, V. (2026). Patterns and adaptive differences of aquatic macroinvertebrates in protected and non-protected aquatic systems of Rwanda. *Environmental Monitoring and Assessment*, 198(5), 440. [Read more](#)
3. Ndatimana, G., Keke, U. N., Nantege, D., Chukwuemeka, V. I., Action, S., Assie, A. F., ... & Arimoro, F. O. (2026). Sediment-Macrophyte Interactions in Heavy Metal Contaminated Lakes: Insights into Bioaccumulation and Phytoremediation Potential. *Water, Air, & Soil Pollution*, 237(10), 568. [Read more](#)
4. Nsengimana, V., Gómez, K., Dekoninck, W., Kouakou, L. M., Hawkes, P., Molenaar, D., & Bantlin, D. (2026). High ant (Hymenoptera: Formicidae) diversity revealed in Akagera National Park in eastern Rwanda. *African Entomology*, 34(1). [Read more](#)
5. Ntivuguruzwa, J. B., Ntampaka, P., Twagirayezu, E., Isingizwe, S., Habumugisha, J., Mbonyinshuti, V., ... & Ntawubizi, M. One Health assessment of fascioliasis and schistosomiasis in humans, livestock, and snail vectors in peri-urban Rwanda. [Read more](#)
6. Nsengimana, V., Ndatimana, G., Hagenima, T., Rurangwa, M. L., Furaha, E., Niyomwungeri, J. F., ... & Nsengimana, O. (2026). Seasonal variation of butterflies from high altitude Rugezi marshland, Northern Rwanda. *BMC zoology*, 11(1), 11-11. [Read more](#)

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