Call for applications
Research Grants for University of Rwanda Master's and PhD students
to support thesis research

A collaborative agreement between Rwanda Environment Management Authority (REMA) and University of Rwanda (UR) for sponsored research under the project entitle: **Research project to improve management knowledge of the Gishwati-Mukura landscape** enables the offering of research grants in line with the objectives of the Landscape Approach to Forest Restoration and Conservation (LAFREC) project at REMA.

Under the support from GEF and LDCF through the World Bank, REMA is implementing the Landscape Approach to Forest Restoration and Conservation (LAFREC) project. The project will use a landscape approach to bring the forest ecosystems into better management and develop multiple benefits. This will be achieved through the conservation and sustainable use of biodiversity, increased forest cover, climate change adaptation efforts together with combating land degradation and provision of livelihood alternatives to the impacted communities.

The project development and the global environmental objective of LAFREC project is to demonstrate landscape management for enhanced environmental services and climate resilience in one priority landscape of Gishwati and Mukura. The project will result in a major advance in the restoration of the highly degraded Gishwati-Mukura landscape, enhancing both productive and environmental values. The project will work concurrently in the three major elements of the landscape:

- Rehabilitating forests and biodiversity within the Gishwati and Mukura Forest Reserves,
- Enhancing sustainable land management in the agricultural lands between them, and
- Introducing silvo-pastoral approaches in the rangelands of the central former Gishwati Reserve.

The **Center of Excellence in Biodiversity and Natural Resources Management (**CoEB) is collaborating with the LAFREC project to demonstrate landscape management for enhanced environmental services and climate resilience in the Gishwati-Mukura Landscape, a priority landscape for Rwanda and the region. The CoEB is well positioned to become a key technical partner with REMA and LAFREC to implement the research component of this project. The CoEB is a knowledge management center consisting of a consortium of governmental and non-governmental environment-related research and higher learning institutions called ***nodes***, coordinated by a central ***hub*** located at University of Rwanda. The mission of the Center is to ***enhance the knowledge of biodiversity and natural resource management for sustainable development.***

The Center focuses on three main areas: 1) *Education and awareness raising* for biodiversity and natural resource management including advocacy, promotion of science-policy linkages, and improved knowledge management and information sharing mechanisms; 2) *Research and*

monitoring to generate knowledge about biodiversity and natural resources, including biodiversity informatics, for evidence-based decision-making supporting policy development and sustainable development goals; *Valorization of biodiversity* from genes to ecosystems for sustainable development in Rwanda through *bioprospecting* initiatives. The Center functions as a consortium with its nodes to produce firsthand knowledge through research and education, while the hub plays a catalytic and coordinating role to ensure sharing of scientific knowledge, skills and expertise.

The proposed research projects available for UR Masters and PhD thesis students will contribute to the following LAFREC Project components:

1. Forest-friendly and climate-resilient restoration of Gishwati-Mukura landscape
2. Upgrading and sustainable management of Gishwati and Mukura Forest Reserves
3. Forest restoration and land husbandry in the Gishwati-Mukura landscape
4. Sustainable and resilient livelihoods
5. Applied research and impact monitoring

The research projects should address Priority Research Areas from the LAFREC project document:

1. Biodiversity inventory and forest ecology for Mukura and Gishwati Forest Reserves
2. Ecological investigations on the health, needs and constraints of the chimpanzee population and other primates, following on from work already started through collaborations between Forests of Hope and Western researchers and with a view to developing a long-term recovery and population management strategy
3. Evaluation of forest restoration practices
4. Propagation of native tree and forest species
5. Integration and productive use of native species within agroforestry systems
6. Benefits of agroforestry techniques in rangeland and silvopastoral practices
7. Improved woodlot management
8. Rural energy solutions
9. Effectiveness of the co-management approach to improve livelihoods and biodiversity conservation

Positive impacts from these research projects include contributions to:

- improved native biodiversity
- enhanced carbon sequestration
- improved watershed function
- higher productivity and diversity of natural-resource-based livelihoods
- climate resiliency
- capacity building for biodiversity conservation
- community outreach
- evaluation and monitoring of LAFREC restoration projects
- enhanced collaborations with UR

Participatory approach to protected area conservation design and management

Establishment of this new park represents a unique opportunity to introduce and validate a participatory approach involving local communities with the premise that this will enhance

park management and biodiversity conservation. There are many tools available to establish a participatory framework with communities around protected areas including community mapping, participatory GIS, and biocultural approaches. In addition to the ecological research proposed here, this proposal includes a component to assess and establish a framework for local community participation in park establishment and management.

Potential Research Projects for UR Masters or PhD students

A list of potential research projects is presented in Table 1. Field work will last three months for each selected student, depending on the particular project. It is expected that the results from these studies will be applied to country-wide scenarios to inform and improve national level environmental management.

Table 1. Proposed research projects. There may be more than one student within one topic depending on breadth of the topic.

	Research Projects
1	Bird diversity
2	Small mammals
3	Amphibians and Reptiles
	Bats
4	Butterflies and Dragonflies
5	Terrestrial invertebrates
6	Regeneration dynamics
7	Ecological functioning
8	Carbon storage
9	Evaluation of restoration techniques
10	Riparian vegetation assessment
11	Species diversity in riparian zones
12	Primate diversity and distribution
13	Primate Health Monitoring
14	Chimpanzee habitat quality
15	Primate Crop Raiding
16	Evaluation of community perceptions and interactions with the GMNP
17	Evaluation of co-management approach and community participation
18	Assessment of silvo-pastoral approach on socio-economic status
19	Assessment of silvo-pastoral approach on biodiversity
20	Soil quality assessments in agroforestry zones and silvo-pastoral sites
21	Mining site restoration assessment
22	Exotic species removal – assessment of effectiveness and natural regeneration in removal sites
23	Biodiversity in buffer zones
24	Buffer zone effectiveness
25	Ecosystem functioning in agroforestry

26	Biodiversity in agroforestry systems and impacts of agroforestry on soil quality and other parameters
27	Ecotourism
28	Ecosystem Services
29	Implementing a participatory approach
30	Flood risk evaluation

Details of possible research projects to help guide proposal development

1. ***Biodiversity studies in the GMNP (may include both Gishwati and Mukura depending on taxonomic groups)***

a) *Biodiversity monitoring* – various taxonomic groups; sampling will occur inside and outside the park boundaries, including within agroforestry zones using a landscape scale approach. This information will contribute to park conservation management and eco-tourism development.

a1) Birds - Assessment of the seasonal use of GMNP by migratory birds and IUCN listed bird species (threatened and endangered), as well as endemic bird species use of the park.

a2) Small mammals – Distribution and abundance relative to habitat types

a3) Primates – Diversity and distribution in GMNP; diurnal and nocturnal species survey for abundance and distribution. We will work in collaboration with on-going projects in GMNP. This research component will establish presence and distribution of all primate species in the park relative to specific restoration initiatives, which will contribute different and complementary information from what is currently being collected by researchers present now in GMNP. Primate health monitoring is a possible project for evaluation of intestinal parasite loads in the primates of GMNP in collaboration with wildlife veterinarians in Rwanda to establish baseline for the primate populations and facilitate long term monitoring especially as tourism expands.

a4) Butterflies and Dragonflies - – Distribution and abundance relative to habitat types

a5) Amphibians and Reptiles – Distribution and abundance relative to habitat types

a6) Bats – Distribution and abundance relative to habitat types

a7) Terrestrial invertebrates – Distribution and abundance relative to habitat types

b) *Forest Regeneration Dynamics* – assessment of tree species regeneration dynamics (seed dispersal, seedling regeneration), functional groups assessment, and identification of factors that are inhibiting and promoting natural forest regeneration in the park. This information will contribute to the reforestation and maintenance of ecological functioning in the park, contributing to carbon sequestration and eco-tourism.

c) *Ecological functioning* – assessment of key indicators of ecological functioning in the park using relevant indicator systems that are relatively easy to assess: seed dispersal, leaf litter invertebrates, dragonfly distribution and abundance.

d) *Evaluation of restoration techniques within the park boundary* – monitor the growth rates and health of restoration areas within the GMNP in order to take lessons learned and contribute to understanding effective montane tropical forest restoration.

e) *Biodiversity assessment outside the park boundaries* – documentation of distribution and abundance of wildlife outside the park

2. ***Carbon sequestration*** - using data from Nyungwe NP (wood density measures) combined with vegetation data from GMNP (DBH, density), assessment of carbon storage potential for the park using productivity estimates and standard procedures. The EX-ACT carbon balance tool from FAO will be included in this assessment.
3. ***Watershed function***
    a) Riparian vegetation assessment – assess the abundance and distribution of riparian vegetation in the GMNP, to contribute recommendations for enhanced watershed function, river bank stability and resilience.
    b) Species diversity in riparian zones of the GMNP – assessment of the diversity of birds, mammals, and other animal groups in the riparian zones, which are generally known to be important areas for biodiversity including animal movement.
4. ***Human-wildlife interactions***
    a) *Primate crop raiding* – following on the prior research conducted on crop raiding around Gishwati and Mukura forest, an evaluation of the extent, causes for, and potential mitigation of crop raiding will be carried out (including all animal species involved in crop raiding). Collaborations will be maintained with researchers who have previously conducted research in Gishwati forest on this topic.
    b) *Evaluation of perceptions and interactions with the GMNP by people in communities around the park* – assessment of the kinds of interactions people have with the forest including resources used, how they are affected when they cannot access the park, contribution of the forest to their wellbeing and livelihoods, suggestions for park management and their livelihood improvement and participation in park management.
5. ***Mine site restoration*** - Evaluation of mine site restoration activities (especially Mukura) through biodiversity census and ecosystem function assessment using indicators.
6. ***Exotic species removal*** – monitoring of vegetation following removal of exotic species to assess which species return, native or non-native, and ecological trajectory of the removal sites.
7. ***Buffer zones and Agroforestry zones***
    a) *Biodiversity in buffer zones and agroforestry zones*; growth rates of planted species and survival rates
    b) *Effectiveness of buffer zones and agroforestry plantings* – buffer zones are meant to 'buffer' or mediate interactions between the protected area and the surrounding landscape and people; this project will assess the use of buffer zones by the surrounding community, impacts on livelihoods, preference for different buffer zones, and how effective the buffer zones are at mitigating crop raiding and other negative human-wildlife interactions; assessment of the biodiversity present in agroforestry systems, and variables correlated with

biodiversity present in agroforestry zones. This component will help understand the contributions of agroforestry to biodiversity conservation.

c) *Ecosystem functioning in agroforestry zones* – indicators of ecosystem functioning such as leaf litter insects and soil micro-organisms will be assessed in the agroforestry established in the LAFREC project and compared with traditional systems. Soil fertility assessments will help indicate impacts of the agroforestry approaches on soils and productivity.

8. ***Ecotourism*** – Assessment of effectiveness of ecotourism in contributing to livelihood improvement and wellbeing of communities around the park; this will include assessment of the participatory role of local communities in the development of the ecotourism industry around the park, and follow up monitoring.
9. ***Ecosystem services*** – assessment of the ecological services provided by the park to different sectors and how local communities can benefit from establishment of the park through ecosystem services maintenance through threat reduction.

   Proposed research priority areas and activities, and the student involvement
10. ***Implementing a co-management or participatory approach*** – participatory tools will be used to assess the perceptions, knowledge, and understanding that contribute to facilitating a participatory approach with local community members around the protected area; different techniques will be used to solicit information that can be used to engage local communities in the process of establishing and managing the new park. Perceptions of activities including agroforestry techniques and silvopastoral methods will be assessed to understand how these activities impact community adoption of new practices and impacts on socio-economic status.
11. ***Silvopastoral projects, biodiversity and livelihoods improvement*** (social and natural sciences) – assessment of the biodiversity supported by the silvopastoral approaches used in the LAFREC project including the living fences, survival of each of the four categories of planted species within the living fences, and connectivity across the landscape due to the living fences and indigenous tree plantings. Assessment of the impacts of the silvopastoral approach to livelihood and wellbeing improvement and biodiversity presence and distribution. Soil quality will also be assessed to understand the impact of the silvopastoral approaches. This may also include evaluation of woodlot management to achieve benefits and goals, and development and assessment of impacts of rural energy solutions.
12. **Flood risk management and impact assessment** – interventions in this landscape target reduction in flood risk and developing resiliency of the landscape to climate change; projects can evaluation effectiveness of improved land management practices that are meant to reduce flood risk; projects will also support the impact assessment of the project.

Successful proposals will receive a research grant that will cover funding for the research permit, lodging, communications and transport for 90 days, as well as some field equipment, and fees for supervision and site visits by supervisors for each student. The total amount of the grant per student will not exceed approximately 1,935,000 Rwf/student, to be used for the research permit, transport, food, lodging, and communications while in the field. Equipment

is not included, and some key equipment is being purchased for the projects. This amount may be different for PhD students and will be determined based on specific projects proposed.

Expected outcomes from the UR Master's and PhD student researchers: Students who receive the research grants are expected to participate in regular research meetings for all researchers in the Gishwati-Mukura Landscape funded by this project, to discuss research updates, and engage in interdisciplinary dialogue to enhance research outcomes. Outcomes from funded students include a report to LAFREC with results from each student, and the final thesis report towards the student's MS or PhD degree following UR requirements. REMA would like these project results to be applicable to other scenarios across the country, and students should consider this in writing up the results of their research projects. Projects will conclude by January 2019 at the latest when results will be presented. It is expected that students will publish their results in peer-review journals with assistance from project supervisors.

To apply for the scholarship funding, students must submit the following:

1) Cover letter explaining reasons why you believe you are qualified to receive the research grant. *In your cover letter you must indicate which number from Table 1 your research project falls in.*
2) Evidence of current registration in a UR MS or PhD program relevant to the proposed LAFREC research topics (pending registration is possible if the registration will be confirmed by the start of the field work)
3) Research proposal of no more than 10 pages in length with the following sections (see below for more details on what is expected in this proposal):
    - Introduction (not more than 3-6 paragraphs; include brief theoretical framework for your study, brief background information and clear statement of research question(s))
    - Literature review (not more than 4 pages; theoretical framework showing where your research question(s) come from, and why they are important
    - Methods section – clearly explain the methods you will use to gather data to answer your research questions; explain how you will analyze your data
    - Expected Results – explain how you believe your research project will contribute to LAFREC's objectives
    - Time line (not included in page limit)
    - Budget (not included in page limit)
    - Literature Cited – you must use a software such as Mendely (not included in page limit)
    - Number all pages, use 12-point font, include your name on the title page, and use 1 ½ line spacing.
4) CV – must include a list of references, including contact information for each reference
5) List of proposed supervisors, including main supervisor and at least one additional committee member who will supervise your research

All documents must be submitted to CoEB@ur.ac.rw – you must include this in the Subject line: LAFREC research proposal.

Deadline for application: Applications will be considered by an Oversight committee as they are submitted until 15 March or until all funds are allocated, whichever comes first. It is advisable to submit your application as early as you can.

Evaluation of Research grant proposals will be completed by a team of academic staff from UR and other members of the Oversight committee for this collaborative project. Criteria include relevance of the research to the LAFREC project goals, quality of proposal in terms of quality of the: writing, theoretical framework, research questions, research design, and academic, research and field experience background of the applicant, as well as adherence to the guidelines contained in this document,. All students applying must be current MS or PhD students registered in a UR program relevant to the LAFREC project goals at the time of application.

For questions email: CoEB@ur.ac.rw or call Prof Beth Kaplin at 0788664551

Detailed guidelines for the proposal

Introduction: 3-6 paragraphs; the introduction should present the research you wish to do and place it into a theoretical context or conceptual framework - what has been done before and why the question is important. Keep in mind that in the Background section you will go into greater detail on justification so the Introduction needs to set the context for the project you are proposing. In the introduction you will establish the general boundary or territory of your research project. You should describe the general foundation for your study, including references or citations from existing literature so that you provide a good enough background for the reader to understand where your study questions come from but you don't want to give too much detail that becomes redundant with the background section. The introduction should include the justification for why this question is important. The introduction should end with the last paragraph clearly stating your research questions. You do not need a separate section called Problem Statement. Just state clearly your research questions. If you are using 'goal' and 'objective' (e.g., the objectives of my research are to…) be sure you understand the difference between goal and objective. If you are using hypotheses and/or predictions these can go in the start of the Methods section linked to your specific methods.

Background or Literature Review: This section may be 2-4 pages and will establish the theoretical framework for your research. You may include conceptual diagrams to illustrate your research questions and framework but it is not a requirement. This section should be tight and cohesive with good transitions and segues that shows the reader you understand what has been done before and where your research question(s) come from – you will use citations from the relevant literature to back up your points. Do not list every study you read. Make a point or posit an argument and then back it up with examples from the literature.

Methods: It is helpful to repeat your research questions and link each question to the methods you will use to collect data to quantitatively or qualitatively analyze and answer your research question(s). Your methods need to be in enough detail so the reader could do your study by following your methods section. Your will include an explanation of how you will analyze your data in this section.

Time line: Include a time line for when you wish to finalize the proposal and begin the data collection.

Anticipated format for thesis: describe how you envision your chapters to come together; how many chapters and the focus for each chapter; which ones you wish to publish and in what journal.

Literature cited section – you must use citation software such as Mendeley.

Appendices: If you are using a survey or questionnaire you will need to include a draft in the Appendix.

Some hints:
Use first person active voice (I will…). Don't use numbering on your subheadings or section titles. You must have at least one person edit your proposal so that you do not submit a first draft for consideration for these grants. Number your pages. Make sure your name is on the document and include the date it was submitted on the title page! Never submit a first draft – get a colleague or mentor to review it and revise it before submitting the final best version.