Project Partners: BirdLife International will lead on the project implementation and fundraising; working together with its partner in Burundi: the Association Burundaise pour la Protection de la Nature (ABN). BirdLife will also closely collaborate with the Government and NGOs in Rwanda and Burundi. E.g. the Water for Growth Rwanda and Rwanda Water and Forestry Authority.

Project Donor: MacArthur Foundation

Project Goals:

**Long-term goal:** Reduced vulnerability and enhanced resilience of 2 million people in the basins and the ecosystems upon which they depend. This is the approximate number of inhabitants, all of whom are dependent at the very least on fresh water provision and regulation.

**Short-term goal:** Rates of erosion and sedimentation reduced by at least 10% in three river systems in the Kivu-Rusizi Basins. A 10% reduction is a conservative target; project activities will enable a precise evaluation of whether this goal is achieved.
What are the CRAGs?

The acronym CRAGs stands for Climate Resilient Altitudinal Gradients. It is a new concept that was developed during the formulation of the conservation strategy for the Great Lakes Region of East and Central Africa, funded by MacArthur Foundation. CRAGs are landscape units with a minimum altitudinal range of 1,000 meters above sea level. The CRAGs are also characterized by climate resilient biodiversity and ecosystem service values. Altitudinal Gradients (AGs) in the African Great Lakes Region (GLR) are found on the very steep slopes of the Kivu/Rusizi Catchments; but also at more gentle hillsides around Lake Victoria.

AGs are key for domestic and industrial use, they sustain Biodiversity and all life of humans around the Great Lakes. Their vulnerability to climate change affects both human and natural well-being.

The CRAG approach gives space for climate change resilience, it ensures that ecosystem services are maintained, involves the buffer zone management (Key Biodiversity Areas), integrated watershed management, focused land use policy and advocacy. For the CRAG approach, local communities work on the conservation of marginal lands across the GLR.

What are the key challenges faced by the AGs of the Kivu/Rusizi Basins?

The problem is accelerated environmental degradation as a result of climate change, with severe implications for biodiversity and human livelihoods. Rainfall is projected to increase by over 200 mm/year and dry season temperatures by more than 2°C by 2060. As the Kivu/Rusizi basins are fringed by rugged mountains rising to over 3,000 m a.b.s.l; and steep slopes with degraded vegetation and bare soils, an increase in the intensity, quantity and frequency of rainfall on exposed soils will accelerate erosion and sedimentation. This will increase the water turbidity, lower dissolved oxygen levels, and reduce hydropower output, irrigation efficiency, soil fertility and fish productivity (Lake Tanganyika Authority Strategic Plan, 2011).

Key opportunities in the Kivu/Rusizi Basins

They include fifteen Key Biodiversity Areas (KBAs), home for almost seventy and one endangered and endemic species. The Basins also provide ecosystem services such as provision of food and water to the inhabitants of the Basins in Rwanda, Burundi and DRC.
Piloting the CRAG approach in the Lake Kivu and Rusizi River Basins

The Lake Kivu and Rusizi River basins were selected because they qualify in terms of topography and have high biodiversity values and provide ecosystem services to over 2 million population in Rwanda, Burundi and the Democratic Republic of Congo (DRC). The CRAG approach was piloted through on ground community actions and developing a CRAG Intervention Plan (CIP); both designed to enhance and build climate change resilience in the Kivu/Rusizi Basins. These activities were funded by John D. and Catherine T. MacArthur Foundation; started in April 2014 and were completed in March 2017. Lead by BirdLife International, the CRAG activities were implemented working together with the Wildlife Conservation Society (WCS) and BirdLife Partners in Rwanda, Burundi and DRC. These activities constitute a so called CRAGs I project.

Structure of the CRAG Intervention Plan (CIP)

- The CIP is organized into the framework of the State, Benefits, Pressure, Response; that are composed by ten chapters:
  - Background – Chapter 1
  - STATE – Chapter 2: The Kivu-Rusizi Landscape
  - STATE – Chapter 3: Socio-economic, Policy and Institutional Context
  - BENEFITS – Chapter 4: Biodiversity in the Basins
  - BENEFITS – Chapter 5: Ecosystem Services
  - PRESSURES – Chapter 6: Climate Change
  - PRESSURES – Chapter 7: Threats
  - RESPONSE – Chapter 8: Interventions

CRAG on ground implemented activities – with the involvement of Local Conservation Groups (LCGs)

- In Rwanda: Four communities in Nyamasheke district were identified and financially supported to plant a total of 210,814 trees for agroforestry on steep terrain or bare land and 7,000 bamboo planted along one section of the Lake Kivu shores.
- In DRC: Four community groups were supported and a total of 31,672 tree seedlings were also planted. Furthermore, four women’s groups were identified, and supported to use the improved cooking stoves.
- In Burundi: One community group was identified. A workshop on integrated watershed management was conducted and later this community was technically and financially supported to plant a total of 215, 000 trees on vulnerable selected sites.

The CIP content was enriched by different stakeholders from Rwanda, Burundi, DRC and researchers from the United States of America.
A new phase for the CRAG project: CRAGs II

This project is also funded by the MacArthur Foundation and will be implemented by a BirdLife partner in Burundi, and BirdLife International, Kigali Office; under the overall coordination of BirdLife International, Nairobi Office. This project focuses on one recommendation from the CIP: controlling lake and river sedimentation from the root source. The project consists of three main components that will last for 24 months, starting from April 2017:

1) Identification of erosion hotspots that contribute most to the sedimentation of Sebeya, Ruhwa Rivers in Rwanda and Muhira River in Burundi.

The three River systems were selected based on stakeholder workshop recommendations, but also by considering the hydropower production and other complementary projects (Sebeya), sediment load (Muhira) and contrasting land use (Ruhwa). This step will involve the:
- Collection of soil samples from sites where active erosion is occurring;
- Collection of downstream water samples, for which the source of sediment is to be determined;
- Statistical analysis of both types of samples for a variety of potential tracer properties;
- Statistical analysis of the tracer properties to determine which ones are able to reliably discriminate between the potential tracers;
- Statistical apportioning of downstream sediment to the various potential sources using a mixing model.

2) Engagement and empowerment of communities at these sites to reduce erosion and sedimentation using well established ecosystem based adaptation and soil conservation techniques. Basically, at each river system, two Local Conservation Groups (LCGs) will be established and engaged in the sediments and soil data collection, and later involved in suggesting and implementing interventions for climate change adaptation.

3) Influencing policy; through the long term contribution to the analysis of the existing policy and laws and proposing improvements for the law enforcement and compliance.

The CRAG approach: Turning Altitudinal Gradients (AGs) into Climate Resilient Altitudinal Gradients (CRAGs)
Collaboration with other key stakeholders for the successful implementation of the CRAGs II activities

- The Water for Growth Rwanda is already working in the Sebeya Catchment-Integrated Water Resources Management Programme; has carried out a situation analysis, risks and opportunities; has developed a Catchment management plan for 2017 – 2023 and is ready to collaborate with various stakeholders for implementing the plan. There are some early implemented activities, including bench and progressive terraces.

- The Vital Signs: being implemented under the WCS Rwanda; this program is a monitoring system for agriculture and human well-being. Although there are no interventions under this program, some baseline data about household income, agriculture input and output, can be obtained from there.

- Rwanda Water and Forestry Authority (RWFA), under the Rwandan Ministry of Land and Forests and the Ministry of Environment: a sediment fingerprinting study has been carried out for the Upper Nyabarongo Catchment; and the results are linked and incorporated into the Government planning strategies.

- Landscape Approach to Forest Restoration and Conservation (LAFREC); being implemented under the Rwanda Environment Management Authority (REMA). LAFREC program aims at restoring the degraded Gishwati-Mukura landscape in the North Western Rwanda; comprising areas of the Sebeya Catchment.

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