Biodiversity informatics-led Solutions For Sustainable Natural Resource Management (BS4NR)

I. Background

Given the current global consensus on the link between biodiversity and sustainable development, decisions-makers have to ensure the plans they draw are conducive to ecosystems conservation and preservation of species and genetic diversity. This is even more important regarding decisions related to natural resources management which define the extent of the impact of human activities to natural ecosystems. These decisions have to be based on reliable information on the state of the ecosystems to be affected and the pressures these ecosystems are exposed to. With this information, effective responses can be adopted to address these threats and enhance the benefits people get from these natural ecosystems.

To illustrate this stated importance of informed decision-making in the domain of natural resources management, a project termed ***Biodiversity informatics-led Solutions For Sustainable Natural Resource Management*** (BS4NR) is implemented by ARCOS with support from International Foundation for Science (IFS) through is early-career researchers' fund.


Water hyacinth-infected parts of the Rweru-mugesera wetland complex

The overall goal of the project is to demonstrate the link between biodiversity information and effective planning and management of natural resources.

II. Objectives of the project

The project will use various biodiversity data science techniques to achieve the following objectives:

1) To develop and pilot a **customized biodiversity monitoring scheme** that could be adopted by different government, academic and research institutions as well as NGOs and private sector to support informed decision-making on issues related to natural resources management.

2) To document the **importance of the Rweru-Mugesera** wetland as part of a contribution towards its gazetting as a Ramsar site.
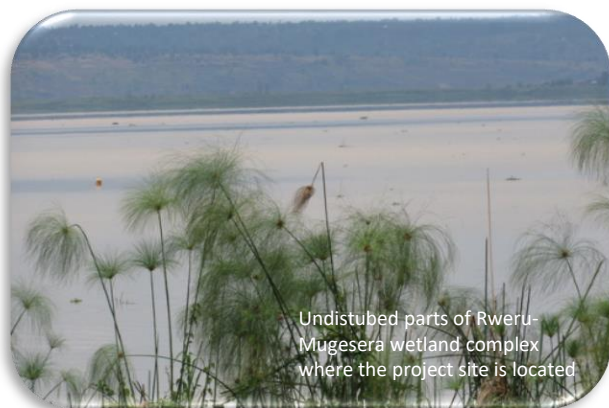
Undistubed parts of Rweru-Mugesera wetland complex where the project site is located

III. Methodology

The **Integrated Landscape Assessment and Monitoring (ILAM)** framework will be used to assess the biodiversity of the project site, its ecosystem services, and the socio-economic conditions in the area surrounding the wetland that affect it. This ILAM framework has been developed by ARCOS to provide a harmonised, participatory and cost-effective biodiversity monitoring framework that generates and provides information that is used by all stakeholders for biodiversity conservation and for promoting sustainable development in the region. ILAM uses a number of simple and easy-to-assess indicators which are categorized following the Driver-Pressure-Response model.

The protocol below below will be followed for the assessment of selected indicators:

Plant survey : Data will be used to assess soil properties and degradation.
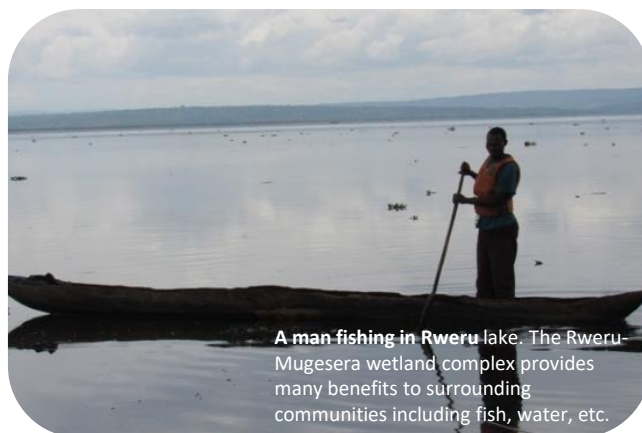
Birds survey : Data will be used to assess the level of wetland degradation and its disturbance.

Macro-invertebrates : Data will be used to assess water quality and its level of pollution.

Odonates : They will be used a general bio-indicator of water quality and wetland ecosystem degradation.

Butterflies : They will be used as an indicator of the level of environmental disturbance undergone by the wetland.

House Holds surveys: Data will be used to assess level of use of wetland's ecosystem services by surrounding communities and the pressure this use puts to the latter.

A man fishing in Rweru lake. The Rweru-Mugesera wetland complex provides many benefits to surrounding communities including fish, water, etc.

IV. Expectations

The study aims at demonstrating the importance of the Rweru-Mugesera wetland complex so as to contribute to the decision of making it a Ramsar site.

Specific outputs of the project will include**:**

1) A paper summarizing the results of the study and showcasing the importance of Rweru-Mugesera wetland complex for biodiversity conservation, national economy and community livelihoods

2) A simple yet comprehensive biodiversity monitoring protocol that can be used to assess freshwater ecosystems in Rwanda to support decision-making about their management

3) A number of outreach materials on the importance of use of biodiversity data for informed decision-making around natural resources management

4) A number of datasets that will be published through GBIF biodiversity data publishing facilities for use by researchers worldwide

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