Project 1

Strengthening Natural Resource Management

Team Leaders:
1. Prof. Dennis O. Ochuodho - JOOUST
2. Prof. Steven Bouillon - KU LEUVEN
Project Team Members

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❖ Prof. Julius Manyala (Aquatic Ecology),
❖ Prof. Regina Nyunja (Biodiversity)
❖ Prof. Maurice Nyadawa (Hydrology)
❖ Prof. Bernard Muok (Climatology)
❖ Dr. Lornna Okotto (N-Resource Management)
❖ Dr. Angeline Ochung (Water Chemistry)
❖ Dr. Samuel Nyangueso (Remote Sensing)
❖ Dr. Pheobe Sikuku (Plant Physiology)
❖ Dr. Collins Mwesesa (Entomology)
❖ Dr. Benson Onyango (Soil Microbiology)
❖ Dr. Eric Okuku (Fish Ecology)
❖ Dr. William Okello (Aquatic Ecology)
❖ Dr. Phoebe S

❖ Prof. Steven Bouillon - Team Leader
❖ Dr. Alberto Borges– (U-LIEGE)
❖ Prof. Ivan Janssens –(University of Antwerp)
❖ Prof. Ann van Griensven (VUB)
❖ Dr. Gretchen Gettel –(UNESCO-IHE, Delft)
Understanding the local context

Lambwe Valley
Within Lk. Victoria Basin

Tourism/preservation of natural ecosystem; standing for the former natural grazing system

Agriculture conversion Livestock grazing

Ruma National Park

Muddy water of Olambwe River carrying nutrients into Lake Victoria

Vegetation clearing for crop production

Current ecosystem threats relate to demographics

Crop production
Bare soil after harvesting
Land lies fallow after plots become unproductive

Turbidity/poor water quality
Invasion of lake by weeds
The Project’s medium-term (5 year) objectives

- Characterize land cover changes, land uses and climate within the Lake Victoria Basin (LVB) in Kenya;
- Quantify landscape processes, identify linkages and feedback loops and develop integrated data base for sustainable management;
- Enhance data integration and prediction through modelling.

Long-Term (10 years) Project Objectives

- Build competencies for environmental monitoring and natural resource management.
- Strengthen JOOUST’s capacity as a reservoir of knowledge and a pinnacle for capacity building in natural resource management.
SP1: Catchment-scale water, sediment, carbon and nutrient fluxes

Preliminary ideas:
- Combination of new data acquisition, existing data compilation (field, remote sensing), and modelling work.
- Quantify and understand water, sediment, carbon & nutrient fluxes in relation to land use and land use changes.
- Links possible with other project components – e.g. sensor technology, modelling techniques
- Strong links to the 2 other topics in project 1 – catchment continuum (land-rivers-wetlands-lake).
SP2: Eddy covariance - CO₂, water, and CH₄ exchange in papyrus wetlands:

Preliminary ideas:
- Ambitious aim to set up eddy covariance system in papyrus wetlands (+/- the first), highly important system in terms of C sequestration & CH₄ emissions.
- Links possible with other project components – e.g. sensor technology, data processing, meteorological data.
- Possibilities for studies on drivers of GHG exchange (water levels, nutrient inputs, wetland conversion, ...)
- Strong links to the 2 other topics in project 1 – catchment continuum (land-rivers-wetlands-lake).
SP3: Lake Victoria water quality and ecology

Preliminary ideas:
- Strong eutrophication, anthropogenic impact is locally high. Long-term data series are lacking.
- Impact of land-use change on aquatic ecology and biogeochemistry: productivity, metabolic balance, greenhouse gas exchange.
- Possibilities to stimulate regional network of studies on L. Victoria (NaFIRRI, TaFIRRI, ..), ACARE network (African Center for Aquatic Research and Education; https://www.agl-acare.org/). JOOUST is currently reviewing a draft MOU for collaboration with ACARE in research, capacity building and exchange programmes
- Links possible with other project components – e.g. sensor technology, remote sensing.
Expertise/ Stakeholders needed for the successful Implementation

Expertise already present in the project team

- Quantification of ecosystem processes,
- Water quality analysis,
- Vegetation sampling/biodiversity,
- Hydrology,
- Aquatic ecology/Fish biology
- Soil microbial community assessment,
- Entomology
- modelling
- Social Ecology

Expertise sought for at level of the Flemish HEIs

- Soil Scientist,
- Modelling
- Vegetation mapping
- Technologist (Electronics),
- Data Management/Statistician,
- Socio-economist
- Nitrogen gas analysis expert
- Ecosystem Services expert
- Remote sensing expert
Interested in this project?

Contact:-

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