

HIPE

Human impacts on ecosystem health and resources of Lake Edward

DURATION
 15/12/2015 – 15/03/2020

BUDGET
 997 897 €

PROJECT DESCRIPTION

HIPE will provide insight to the causes of the recent productivity decline in Lake Edward and its impact on a major local human resource (fisheries). In particular, HIPE will elucidate if the recent decrease of lake productivity results from climate change (precipitation), loss, destruction and fragmentation of habitats, loss of biodiversity (poaching), or overexploitation (overfishing). HIPE will allow to better quantify the consequences of these pressures on ecosystem function and biodiversity. Such information will be highly relevant for the policy makers and managers involved in the conservation of Virunga National Park including Lake Edward. HIPE will be instrumental for providing knowledge for RDC and Uganda authorities to meet the Convention on Biological Diversity's 2020 targets and the United Nations Sustainable Development Goals.

The Virunga National Park (ViNP) is a **hot-spot of biodiversity** both regionally and globally. As such, the ViNP was designated as a **World Heritage Site** in 1979 by the United Nations Educational, Scientific and Cultural Organization (UNESCO), and is recognized for its ecological significance under the UNESCO **Man in the Biosphere Programme (MAB)**. Lake Edward, an integral part of ViNP, is designated as **Outstanding Universal Value** by the UNESCO. Yet, the ViNP is also designated **World Heritage in Danger** by the UNESCO, since 1994. As a consequence, **the sustainable management and conservation of the biodiversity of the ViNP (including Lake Edward) is of the utmost importance and urgency.**

➤ Objectives

The main objective of HIPE is to test the causal relationship between the recent environmental changes and the drastic reduction of lake productivity using innovative paleo-proxies coupled to a study of the present lake functioning. Assessing the validity of the various hypotheses, linked to a better understanding of the ecosystem functioning and a thorough estimation of the socio-economic benefits, will help to develop appropriate management actions to mitigate present and future impacts.

➤ Methodology

HIPE is structured into 5 workpackages (WPs). WP1 will investigate the changes and drivers of change of ecosystem functioning during the recent past (<100 years) based on the analysis of sediment cores, archived bivalve shells and fish specimens using paleo-proxies. This should allow to quantify the recent changes in the lake's productivity and the role of the different drivers. The paleo-proxies need to be interpreted in the frame of the present day productivity and overall carbon and nutrient cycling investigated in the frame of WP2 based on new field measurements of standing stocks and ecological process. Data from WP2 will be used to understand the biology and ecology of fish studied by WP3 that will also quantify the fish biodiversity and evaluate the impacts of the pressures on their biodiversity. WP4 will evaluate the ecosystem services with a special focus on fisheries. WP4 will compile recent fish catch data, and will model fish stocks and catches using data also provided from WP1, WP2 and WP3. WP5 will ensure the integration and coordination of the different WPs, and will play a major role in the dissemination of the results and knowledge to the end-users.



HIPE

➤ Interaction between the different partners

Interaction between the different partners to plan and execute the different tasks of the project is achieved through regular telephone and mail exchange, and occasional informal meetings. Formal annual project meetings will be held annually, back-to-back with the meetings with the follow-up-Committee. ULG coordinates the project and will be involved in acquisition of biogeochemical data related to present-day functioning of L. Edward in collaboration with K.U Leuven that will additionally also acquire isotopic data related to past functioning of L. Edward. RMCA will be in charge of the fish diversity and ecology aspects. ICNN and NaFIRRI will collect fish-catch data and will contribute to the evaluation and modelling of ecosystem services in L. Edward.

➤ Link International Programmes

HIPE will contribute to the mission IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) and ecoSERVICES, that deal with understanding the link between biodiversity and ecosystem function, goods and services, their effect on sustainable development, human well-being and poverty alleviation.

➤ Expected results and/or Products

- Data-set on the geochemistry of recent and historical bivalve shells from L. Edward
- Data-set on the biogeochemistry of sediments from L. Edward
- Data-set on the C, N and H stable isotopes of archived fish specimens from L. Edward
- Data-set on the C stable isotopes of archived hippos specimens from the ViNP
- Data-set on transport of carbon and nutrients from the watershed to L. Edward
- Data-set on hippos abundance and distribution in the vicinity of L. Edward
- Dataset on stable isotope signatures of foodweb components in L. Edward
- Inventory of fishes from sampling campaigns
- Data-set on fish catches and fishing effort from 1956-2017 in L. Edward
- Ecosystem-based fisheries model of Lake Edward
- Data-set on the socio-economic evaluation of fisheries
- Ecosystem-based management plan



CONTACT INFORMATION

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LINKS

Project web page:
<http://www.co2.ulg.ac.be/hipe/>

On Research Gate:
<https://www.researchgate.net/project/HIPE-Human-impacts-on-ecosystem-health-and-resources-of-Lake-Edward>