EOIA PROJECT DETAILS

Duration
1 January 2010 - 31 December 2014

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Project website
https://sites.google.com/site/eoianaivasha

Project Partners
Google
Kenya Wildlife Services (KWS)
WWF Kenya
Lake Naivasha Growers Group (LNGG)
Lake Naivasha Riparian Association (LNRA)
Ministry of Water and Irrigation
Regional Centre of Mapping of Resources for Development (RCMRD)
Rural Focus
Shell
UNESCO-HELP
United Nations University-INWEH
University of Leicester
Water Resources Management Authority (WRMA)
World Agroforestry Centre

Funding
NWO/WOTRO – Integrated Programmes

NWO
Netherlands Organisation for Scientific Research
WOTRO Science for Global Development

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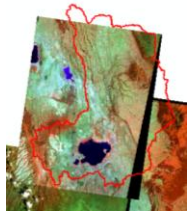
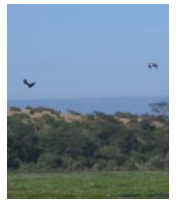
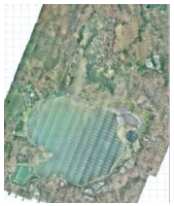
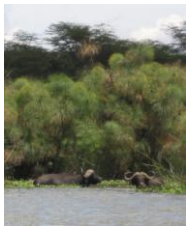
An Earth Observation- and Integrated Assessment (EOIA) approach

to the governance of Lake Naivasha, Kenya


UNIVERSITY OF TWENTE.
ITC FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

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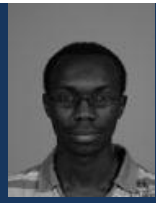
PROJECT DESCRIPTION

The horticultural industry around Naivasha in Kenya is seen as an example of a successful economic growth path to be copied by other African countries. Export of flowers sustains an economy that previously suffered from low employment and low income. However, the environmental price of fast economic growth is hefty: the rapidly growing population, large water abstractions for irrigation, changing land use, and inflow from agrochemicals, put the ecosystem under pressure. In our study we explore possible futures until 2030, taking into account various developments, including climate change scenarios.

We focus on how Earth Observation (EO) and derivative geo-information may help to overcome societal clashes in a collaborative stakeholder setting. Key stakeholders include WRMA, the Water Resource Users Associations (WRUAs), NEMA, LNGG, LNRA, WWF and others.

The scientific tool we apply is a system description based on an Integrated Assessment (IA). IA aims to integrate knowledge over a range of relevant disciplines, and to provide new information how complex real-world systems might behave, thus enabling decision-making. Cross-sectoral implications that might be missed in more traditional assessments can be explicitly explored in ways that are meaningful to stakeholders. Key decision variables as output of this system analysis are livelihood and employment as description of efficiency and equity characteristics of the socio-economic structure of upstream and downstream parts of the Naivasha basin. Also, water quality and water quantity are assessed as a characterization of Lake Naivasha. Finally, habitat and minimum viable population are determined as portrayal of the ecosystem. These final decision variables feed into a stakeholder process that aims at the sustainable governance of the Naivasha basin and its resources.

NATURAL PROCESSES IN THE NAIVASHA BASIN



Hydrology – *Vincent Odongo*
How can we quantify the output of the LN basin (water quantity, sediment and associated phosphorous and nitrate loads) under development and climate scenarios, while compensating for sparse hydro-meteorological data?

Methods: Earth Observation and process modeling

Supervisors: prof. dr. Z. Su, prof. dr. J. O. Onyando, dr. ir. C. van der Tol, drs. R. Becht, dr. ir. J. Hoedjes

Limnology - *Jane Ndungu*
Is the recent switch from clear to muddy status due to external or internal sources? Is this switch reversible? What are the impacts of these changes to trophic status, fishing efforts and population dynamics of fish eating birds species?

Methods: Earth Observation and process modeling

Supervisors: prof. dr. J. Mathooko, prof. dr. S.J.M.H. Hulscher, dr. N. Kitaka, dr.ir. D.C.M. Augustijn, dr. R. Britton

Ecology - *Francis Muthoni*
How do lake level induced fluctuations in fringe habitat area affect the viability of vegetation and mammalian herbivores? What ecosystem services do these species provide? How will these ecosystem services be affected by lake level fluctuations?

Methods: Earth Observation and process modeling

Supervisors: prof. dr. A.K. Skidmore, dr. A. Voinov, dr. ir. T.A. Groen

SOCIAL PROCESSES IN THE NAIVASHA BASIN

Socioeconomics – *Dawit Mulatu*
How to better understand the links between the economy and the environment in the Lake Naivasha basin by using Earth-Observation for estimating socioeconomic indicators and exploring the influence of a payment for environmental services (PES) scheme on the livelihoods in different parts of the Naivasha basin?

Methods: Earth Observation and process modeling

Supervisors: prof. dr. A. van der Veen, prof. dr. P. Kimuyu

Water governance – *Leonard Akwany*
How does the socio-institutional context of water policy and legislation in Kenya influence water resources management and development of Lake Naivasha Basin?

Methods: Earth Observation, Discourse Analysis and Participatory Surveys

Supervisors: prof. dr. G. Krhoda, prof. dr. A. van der Veen, prof. dr. P. Kimuyu

Integrated Assessment – *Pieter van Oel*
How can Earth Observation (EO), integrated modeling and interactive tools be used to effectively support a collaborative stakeholder decision-making process towards improving environmental, social and economic indicators of sustainability?

Methods: Agent-based modeling, spatial data modeling