Radboud University Nijmegen/ University of Duisburg-Essen
Institute for Science, Innovation and Society

Radboud Universiteit Nijmegen

UNIVERSITÄT DUISBURG ESSEN
Open-Minded

Master project for the Master of Science Programme "Transnational ecosystem-based Water Management (TWM)

HENRIK BOURS

CropWat Estimation of Irrigation Water Requirements in the Ewaso Narok Swamp in Laikipia, Kenya and Their Influence on Downstream River Discharges

Keywords: Kenya, Laikipia, Rumuruti, Ewaso Narok, Hydrology, Streamflow analysis, Irrigation, Crop water requirement, CROPWAT, Water resources management, Water use, Agriculture

Agricultural practices are dominating in and around the Ewaso Narok swamp in Laikipia, Kenya, and are likely to increase in the future. (Supplemental) irrigation via mobile pumps and pipes is necessary and evident in a semi-arid environment with unreliable rainfall patterns. Where prohibitive governmental measures to regulate and reduce the use of the limited resource are ineffective, water abstractions are assumed to have considerable effects on the water resources in the catchment, especially during times of low flow, with consequences for wetland health and downstream users.

Based on a two month field visit, this master project aims to estimate the water abstractions for irrigation agriculture (and domestic demands) and their effects on discharge quantities and, ultimately, the entire water resources in this area. In a streamflow analysis, hydrologic patterns and regimes of surface water resources are characterized and interactions between wetland inflows and outflow are examined. CROPWAT simulations calculate the irrigative (and domestic) water requirements of 15 villages practicing agriculture in the wetland area and are coupled with measured discharge quantities.

This master project is part of the GlobE project "Wetlands in East Africa – Reconciling Future Food Production with Environmental Protection" and embedded in the master's programme "Transnational ecosystem-based Water Management (TWM)" of the Radboud University Nijmegen and the University Duisburg-Essen.

Contact data:

Henrik Bours
henrikbours@gmail.com

https://www.uni-due.de/twm/

https://www.wetlands-africa.de/

GlobE Wetlands in East Africa

Work Package	WP A5 Matter fluxes / B2Environmental effects
Countries of work	Kenya
1st Supervisor	Prof. Dr. Toine Smits
2nd Supervisor	Dr. Gabriele Berberich
Subject	Hydrology, Water Resources Management
Faculty	Faculty of Science/Faculty of Biology
University	Radboud University Nijmegen/University Duisburg-Essen
Working period	07/15 – 09/16