PhD thesis at the Research Group of Hydrogeology

LAYLA HASHWEH

HYDROGEOLOGY AND WATER QUALITY OF EWASO NAROK WETLAND IN KENYA

Evaluating the effects of flooding on the quality of surface water and groundwater in Ewaso Narok

Keywords: Wetland, isotopes, fertilizers, pollution, floods, aquifer

Ewaso Narok wetland suffers from heavy water pollution (LENWRUA members, et. al, 2013). As human activity around the catchment is increasing the pollution is expected to increase. There has been no hydrochemical or hydrogeological modelling of the pollutants along the Ewaso Narok catchment.

The study will elaborate in quantitative sense, on the quality between the polluted stream water and the groundwater aquifer underneath. It will do so by assessing the quality of surface and ground water during dry and flood seasons. The main sources and causes of chemical pollution will be identified and quantified. The methodology will include surveys, hydrogeological methods, and a management plan.

The surveys will try to understand the use of the wetland / the policies regarding its use/ the inlet of fertilizers / sewage and their type. Accordingly surface and ground water points for sampling will be decided upon. Water sampling will investigate the hydrochemistry and isotopes. The sampling will take place in the dry and flooding season and the analysis will take place on-site and in the laboratory in the Steinmann-Institute, Bonn. The results will be the base for the statistical and hydrochemical modelling. The results of the modelling will investigate the existence of hydraulic connectivity between the surface and ground water. They will provide information and quantification of the water quality and pollutants amount and track which will enable an estimatation of the groundwater and surface water flow, while clearly recognizing the most polluted spots.

Finally, appropriate management measures to reduce water pollution will be developed to sustain the wetland's short and long term functioning. This will provide essential information to decision makers, and locals to grow their food and use the wetland for daily consumption and irrigation.

Contact data:

Layla Hashweh

Steinmann Institute for Geology, Mineralogy and Palaeontology
Nussallee 8
53115 Bonn
leila.hashweh@gmail.com
Tel.: 0228-73-2491

www.steinmann.uni-bonn.de
www.wetlands-africa.de

Work Package	A5, B2
Countries of work	Kenya
1st Supervisor	Prof. Dr. Barbara Reichert
2nd Supervisor	
Subject	Hydrogeology
Faculty	Faculty of mathematics and natural science
University	University of Bonn
Working period	10/2015 – 10 /2018