Tropentag, September 14-16, 2022, hybrid conference

"Can agroecological farming feed the world?
Farmers' and academia's views"

The not-so-royal tour: impacts of farming on the quality of groundwater and surface water in Tanzania

Mwemezi J. Rwiza[1], Matthias Kleinke[2]

[1] *The Nelson Mandela African Institution of Science and Technology (NM-AIST), School of Materials, Energy, Water and Environmental Sciences (MEWES), Tanzania*
[2] *Rhine-Waal University of Applied Sciences, Fac. of Life Sciences; Sustainable Food Systems Research Group, Germany*

Abstract

A recent film, "Tanzania: The Royal Tour", portrayed Tanzania as the cradle of humanity. The film, starred by Tanzania's President, H.E. Samia Suluhu Hassan and recorded during the COVID-19 pandemic, indicates how vastly rich the country is in terms of natural resources. What is not shown, however, is that having riches of resources is one thing but the quality of such resources is a different phenomenon altogether. Natural resources such as groundwater and surface water are vulnerable to anthropogenic activities that take place in order to feed the world. Some of the recent assessment we conducted in different places Tanzania in the past 3 – 4 years indicated that farming and other were having an additive impact on the country's water resources. For this conference, we chose to showcase five assessments conducted the Mara ecosystem, Manyara area, Zanzibar, and Kilimanjaro. In all cases, water samples were collected and analysis was performed to determine the level of various environmental pollutants. In one of the studies, we conducted in the Mara ecosystem, it was found that Pb and Hg, with mean levels of 70.29 and 17.95 g/L, respectively, were significantly above the standards stipulated in the WHO guidelines. In another study we conducted in the same ecosystem, it was found that for samples collected during the rainy season, the Mara River water were enriched with Pb, Hg, Cr, Cd, and As (0.56, 0.03, 0.55 ± 0.03, 0.48 ± 0.03, and 0.4 ± 0.03 mg/L, respectively – maximum levels). In a study we conducted in the Manyara ecosystem in Northern Tanzania, levels of nitrate in groundwater exceeding 10 mg/L were found next to agricultural fields indicating inputs from farming activities. In conclusion, there is a need to control inputs of detrimental chemicals from farming activities into the natural environment by adopting more sustainable farming practices.

Keywords: Environmental sustainability, groundwater pollution, surface water chemistry, Tanzania, unsustainable farming practices

Contact Address: Matthias Kleinke, Rhine-Waal University of Applied Sciences, Fac. of Life Sciences; Sustainable Food Systems Research Group, Marie-Curie-Str. 1, 47533 Kleve, Germany, e-mail: matthias.kleinke@hochschule-rhein-waal.de