

Masters project at the Hydrology research group

STEPHEN DANIEL

Characterization of Soil Hydrological Properties in Agricultural Used Transect of the Kilombero Floodplain in Tanzania

Keywords: Wetland, Soil fertility, Soil water dynamics, land use management

Soil is a major component supporting all terrestrial ecosystems and is the most basic of all natural resources. It can be *in situ*; developed from weathering of underlying rocks (*residual soil*) or it can be transported by agents such as water and wind (*transported soil*). Most of the wetlands are characterized by transported soils with a mixture of clay, silts, sands, gravels and organic matter and therefore considered to have high soil fertility and hence potential for crop production. However, soil is a complex, living, changing and dynamic component of the agro-ecosystem which is subjected to degradation or decline in its quality due to misuse and mismanagement with agricultural uses, contamination with industrial uses and pollution with disposal of urban wastes. Therefore, sustainable use of soil resources requires a thorough understanding of properties and processes and their spatial and temporal variations. In Kilombero floodplain, there is variation in soil types and possibly soil hydrological properties due to different deposition series of sediments and anthropogenic activities mainly the increase in land usage due to population growth. The spatial variability of the soil types and soil physical properties for agricultural purposes is not well studied. Therefore, this Masters research investigates spatial distribution and variation (heterogeneity) of soils based on their physical hydrological properties for agricultural purposes as well as evaluation of soil moisture dynamicity between seasons. It is part of GlobE wetlands project- reconciling future food production with environmental protection. To achieve the research objective, understanding of hydrological processes, soil distribution within the flood plain based on the soil hydrological properties and how does the soil moisture vary between seasons within the flood plain. Field measurements of soil hydrological parameters such as Bulk density, soil water content- using FDR sensors, Hydraulic conductivity, soil related properties as well as soil fertility (C,N,P,K) will be performed.



Contact:

Stephen Daniel

School of Materials Energy
Water and Environmental Sci-
ence (MEWES)
NELSON MANDELA AFRICAN
INSTITUTION OF SCIENCE AND
TECHNOLOGY ARUSHA
TANZANIA

Email: daniels@nm-aist.ac.tz

www.wetlands-africa.de



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1 st Supervisor	Dr. Kelvin Mtei
2 nd Supervisor	Dr. Constanze Leemhuis
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