Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

The Challenge of Land Degradation to Water Infrastructure Affecting Resilience of Livelihoods in West Africa

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Abstract

Fresh water availability and storage is key for resilience of livelihoods and economies in highly variable rainfall areas such as rural and urban communities of West Africa. The current natural water infrastructure have been much complemented with the >1500 small reservoir infrastructure in Burkina Faso, Mali, Ghana and other locations, largely constructed during 1970–80s, and now functioning through its multipurpose use. These small reservoirs are key in managing rainfall and surface water variability, and providing climate-smart means to develop new livelihood streams including dry season irrigation and strengthening livestock value chain. In this presentation, we concentrate on how land use, land degradation and land use change matter for this existing water infrastructure. Firstly, we share a new assessment of trajectories of community settlement, landuse change and small reservoir infrastructure development in Niger, which is so far one of the least developed countries in terms of water infrastructure. Secondly, we share a GIS assessment of how recent anthropogenic land use changes resulting in sediment, potentially undermine the small reservoir capacity between 2002 and 2014, and the highest change in anthropogenic impact occurred at 5 km buffer around SRs potentially due to high settlement (urbanisation) in that proximity. As a consequence, benefits from small reservoirs can be significantly reduced as storage decreases. To safeguard the functioning of the reservoirs in an era of increased pressure of use due to population growth and increased climate variability, better management strategies of upstream land to reduce sediment transport, alongside regeneration of existing small reservoir infrastructure will be necessary.

Keywords: Climate smart, land use, resilience, sediment, small reservoirs, West Africa

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