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## Establishment of a Hydrological Monitoring System through a Participatory Approach in a Small Tropical Catchment in Tanzania: Learning Hydrology from the Local People

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### Abstract

A hydrological monitoring system is necessary to analyse the hydrological system of a catchment, determine model parameters, provide input and validation data for rainfall runoff models and as tools for investigating impacts of climate change and land use options on water balance. Hydrologic monitoring networks in research catchments are typically established in remote areas where few or no people live. This leads to the risk of theft and vandalism. Thus, local stakeholders should be involved in the design and construction of the networks and in the subsequent monitoring. In the “Resilient Agro-Landscapes to Climate Change in Tanzania” (ReACCT) project, the Wami/Ruvu Basin Water Office (WRBWO), Sokoine University of Agriculture (SUA) experts and village authorities in the project area were involved and participated in establishment of a hydrologic monitoring network in the Ngerengere catchment within the Morogoro Region in Tanzania. First DEM, land use and soil maps were used to identify potential monitoring sites. Local and expert knowledge was collected on flow regime, indicators of shallow ground water plant species, precipitation pattern, vegetation and soil types. This knowledge was integrated and used to site a network of ten hydrologic monitoring plots for vegetation and soil surveys and locations for installation of automatic weather stations, automatic raingauges, river flow gauging stations, flow measurement sites and shallow ground water wells. This approach provided the opportunity for both the experts and local stakeholders to gain insight into the hydrological regime of the catchment which was the basis for determining the locations of the hydrologic monitoring system in the catchment. Local knowledge proved to be very important in site selection of hydrologic monitoring systems. Furthermore, there was complementarity on the roles of stakeholders in accomplishing this task where the local knowledge was integrated with the expert knowledge. Integration of local and expert knowledge in catchment monitoring and integration of new monitoring systems with existing systems helps to instil the sense of ownership and identify best sites for the hydrologic monitoring.

**Keywords:** African catchments, climate change impact assessment, hydrologic monitoring, participatory approach

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