

EGU2020-10714

<https://doi.org/10.5194/egusphere-egu2020-10714>

EGU General Assembly 2020

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Water, Weather and Climate Services for Africa: the case of Ghana and Kenya

Frank Ohene Annor^{1,2}, Nick van de Giesen^{1,2}, and Marie-Claire ten Veldhuis¹

¹Department of Water Resources, Delft University of Technology, Delft, Netherlands

²Trans-African Hydro-Meteorological Observatory, Delft, The Netherlands (annorfrank@tahmo.org)

Close to 80% of Sub-Saharan African farmers rely on rainfed agriculture. This makes it important that the weather and climate in this region is well understood, since it accounts for more than 15% of the GDP for instance in Ghana and Kenya. However, uncertainties in weather forecast and climate projections are very high in particular for this region, which leads to poor weather and climate services for agriculture production. One of the underlying factors among many is the poor conditions of weather and climate infrastructure in Sub-Saharan Africa. The Trans-African Hydro-Meteorological Observatory (TAHMO) together with some National Meteorological and Hydrological Services (NMHSs) in Africa and other partners through the TWIGA project (<http://twiga-h2020.eu/>) are building a network of weather and hydrological stations to address this need. This network builds on the over 500 TAHMO stations in countries of interest like Ghana, Kenya, Uganda, South Africa, and Mozambique.

The observation network includes automatic weather stations, soil moisture sensors, Global Navigation Satellite System (GNSS) receivers, distributed temperature sensing (DTS), lightning sensors, neutron counters, evaporimeters, laser speckle scintillometers, accelerometers for tree weighing, intervalometer rain gauges, flood mapper using citizen science mobile applications (Apps) and crop doctor using drones and Apps. The project has accelerated the Technology Readiness Levels (TRLs) of these innovations with some already set up for operational purposes delivering the first set of TWIGA services such as “How humid is my environment?; Crop detection and condition monitoring; Weather-based alerts for citizens/farmers; Area-specific near real-time weather forecast for farmers; Crop insurance based on soil index; Plastic accumulation monitor; Short-term prediction for solar energy; and Precipitable water vapour monitoring with TWIGA GNSS stations. These new innovations and the services developed using the value chain approach is a game changer for Sub-Saharan Africa.