Hydrological analysis of catchments in S. Tanzania

SNAPP Water subgroup
Goals

• Characterize base-line conditions of water resources in the Southern Highlands of Tanzania

• Identify interactions among land-use change, climate change and water resource management
• Land clearing for agriculture increased

• Dense forests declined

• Same trends expected in the future
Agric.
increased
from 10-15%
projected to
increase to
~25%
Hydrological model to simulate river flow


Historical and future estimates of daily river flow from 1981-2030 for every point in the study area
Application example: continuous data

- **Daily simulations:** 1981-2014; 2015-2030

![Streamflow plot with observed and simulated flows for Msembe Station on Great Ruaha](image)
Application example: continuous data

- The frequency of spell events (no. per year)
- Average Recurrence Interval of events in years
- Average duration of spell events
- Average spell peak
- Minimum duration of spell events
- Average duration of spell events

% Change (x10)

Month

Rainfall

River.flow

Climate.Scenario

- Scenario.45
- Scenario.85
Base flow amount relative to mean daily flow

30% of the stream comprised of base flow base flow
Sediment export – Tones/Ha

Legend

- Development_Clusters: 3.0 - 9.2
- Rufiji basin & subbasins: 9.2 - 21.05
- 1.4: 21.1 - 27.02
- 1.41 - 3.0: 27.02 - 78.9
Select Applications

• Model can be the basis for water allocation modelling
• Supporting water resource management during the dry season
• Predicting water stress at any point in the study area for any day up to 2030
• Sustainable land use management priority setting for water resources in the Southern Highlands
Summary

• Model provides the baseline water balance (1981-2014) and future predictions (2015-2030)

• Future flow will slightly increase over the next 30 years during wet seasons

• Dry seasons are predicted to become drier, with a net decline in river flow and precipitation
Summary
Next steps

• User-Friendly tool: online interphase to access model outputs

• Capacity building

• Scenario building

• Data analyses for other locations of interest