Water Resources Assessment in the Bilate River Catchment - Precipitation Variability

- Poster -

Stefan Thiemann[1] and Gerd Förch[2]

1 Research Institute Water and Environment, Siegen University, Paul-Bonatz-Str. 9-11, 57076 Siegen, Germany, thiemann@fb10.uni-siegen.de

2 Research Institute Water and Environment, Siegen University, Paul-Bonatz-Str. 9-11, 57076 Siegen, Germany, foerch@fb10.uni-siegen.de

The Bilate River is located in the Southern Ethiopian Rift Valley and draining parts of the Western Ethiopian Highlands and the Rift Valley. Rainfall variability and intensity in the catchment follow semi-humid to semiarid tropical precipitation patterns. Variability is caused by alternating dry and rainy seasons, as well as long-term variability, i.e. the El Niño effect, which is overlapping with regional effects.

The analysis of precipitation data of 15 meteorological stations show no regular distribution of the amount and intensity of precipitation. Based on the Köppen-Geiger climate classification system, precipitation patterns in the two main zones – the Rift Valley (A_w) and the Highlands (H) – were analysed separately. It is important to note that meteorological stations located in similar relief positions and at similar altitudes differ in precipitation totals, duration and intensity. Thus, daily or hourly precipitation values are not comparable across stations, monthly precipitation sums also differ strongly. On the whole, rainfall events are local events of short duration (1-5 h) and high intensity (up to 30 mm/h).

Precipitation amounts are generally dependant on altitude. Comparisons of the distribution of monthly average precipitation show that the dependency on altitude more pronounced in the rainy than in the dry season. Though, precipitation patterns during the dry seasons of wet years do not seem to be depend on altitude at all.

The extreme variability of daily and monthly precipitation totals in the catchment essentially hinders the exact assessment or prediction of the availability of the resource water. In addition, the long-term variability of precipitation – overlapping the seasonal variability – cannot be predicted accurately.