

## Drought characteristics and related risks in large and mesoscale tropical catchments in Latin-America and South East Asia

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Seasonal meteorological and hydrological droughts are a recurrent phenomenon in water abundant tropical countries and are expected to become more frequent in the future. Unusual water shortage in the past months and years has severely affected societies living in the Paraíba do Sul river basin (Brazil), the Mekong, as well as in a number of basins in Central America and Vietnam among many others. Preparedness, however, is absent and site appropriate water management measures and strategies are not available. While drought related research and water management in recent years has been widely addressed in water scarce subtropical regions, the US and Europe, not much attention has been paid to drought risk in tropical catchments.

Available daily or monthly precipitation and runoff time series for catchments in Brazil, Costa Rica, Ecuador, the Mekong region and Vietnam were analysed to compare historical meteorological and hydrological drought frequency (SPI/SRI). The role of tropical catchment characteristics, storage and climate variability in seasonal drought evolution was investigated by applying the conceptual semi-distributed HBV light model to two undisturbed catchments in Central Vietnam and 18 catchments of a size of 70-5000 km<sup>2</sup> in Costa Rica. For the Mekong and the Paraíba de Sul, the hydrological module of the WEAP model was applied to undisturbed subcatchments with the same objective.

To understand and separate the anthropogenic impact on drought evolution, the abstractions (irrigation, reservoirs, water supply) and hydrological alterations were observed and quantified by applying water allocation and balance model WEAP.

We conclude that such a combined model-data analysis that equally accounts for landscape related and anthropogenic impacts on the local hydrological cycle is a useful approach for drought management in tropical countries.