



Impacts of Land Use and Degradation on the Hydrology of a Semi-Arid Catchment

Alexandre Cunha Costa (1), Eduardo Sávio Martins (2), Margareth S B S Carvalho (2), and Robson Franklin Silva (2)

(1) UNILAB (Universidade da Integração Internacional da Lusofonia Afro-Brasileira), (2) FUNCEME (Research Institute for Meteorology and Water Resources)

The hydrology of small and medium-sized catchments can drastically be modified due to changes in land use and degradation (LUD). Normally, distributed hydrological models (DHMs) have been used to study the effects of such changes on runoff response at basin scale, which is fundamental e.g. for streamflow forecasts. However, the applicability of DHMs to arid and semi-arid catchments may not be straightforward due to i) generally sparse data, and high spatial variability, of surface and subsurface systems and ii) poor hydrologic monitoring system (e.g. rainfall and runoff). The objective of this work is to use the WASA-SED model, a semi-distributed model, to detect the influence of LUD on the streamflow generation of a medium-sized catchment in Semi-arid Northeastern Brazil. In order to accomplish this goal, the model is run for two scenarios: one with degraded lands and another one without them. Then, the WASA-SED model based on these two scenarios is simulated for different realizations of the main model parameters. The application of the WASA-SED model comprises large uncertainties arising mainly from model input and distributed parameters. However, the model runs corresponding to the degraded lands scenario produce the best results according to the chosen performance criteria.