

MONITORING AND MODELING OF HYDROLOGICAL PROCESSES IN THE SEMIARID REGION OF BRAZIL: THE CARIRI EXPERIMENTAL BASINS

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Abstract

Two experimental basins – the Cariri basins – were installed in a typically semiarid region in the State of Paraíba, Brazil, for obtaining reliable estimates of runoff and soil erosion in different scales to evaluate the influence of the human activities and other factors over the processes of runoff and erosion. In the first basin, located in the municipality of Sumé, the field studies were carried out at three different scales: four micro-basins with an area of around 0.5 ha; nine standard Wischmeier-type erosion plots of 100 m² and seven sample plots of 1 m². The experimental units had varied vegetal cover and management and, except the sample plots, were subjected to natural rainfall events only, and were monitored from 1982 to 1991. The total runoff and total sediment yield were determined for each of the events of precipitation. The installations of the second basin, in the near municipality of São João do Cariri, were planned for the continuation of the studies initiated at Sumé, and include erosion plots (100 m²), micro-basins, and sub-basins, which are being monitored for runoff and sediment production up to now. Among them, two nested micro-basins were monitored to detect any scale effect at the micro-basin level. Nearly 600 events of natural precipitation, that produced runoff in at least one of the experimental units, have been registered. This bulk of data was utilised to evaluate the influence of various factors, including cultivation practices. The data collected so far has been successfully used to calibrate hydrological models for plots and micro-basins. Parameters have been tested by means of cross validations among micro-basins and sub-basins. The data sets, in part, have been made available to researchers in Brazil and now the updated data files are being made available to all the researchers in hydro-sedimentology at: <https://doi.org/10.5281/zenodo.4044690>

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Running Head : Brazilian Cariri Catchments

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