



## **Effects of small reservoirs on water and sediment budgets in semiarid areas**

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Dryland environments are often exposed to the risk that available freshwater resources fail to meet the water demand. In many dryland areas, water resources rely mostly on water stored in reservoirs. However, storage capacity of the reservoirs is often threatened by sedimentation because of severe soil erosion in the catchment area. This study presents a methodology to assess the impact of small reservoirs on water and sediment budgets at the catchment scale. The 933-km<sup>2</sup> Bengue catchment located in semiarid northeastern Brazil has been analysed. About 160 small reservoirs are listed for this river basin, with a very high variability in storage capacity ranging from 11 m<sup>3</sup> to 500,000 m<sup>3</sup>. In the case of these small reservoirs, which usually are not provided with bottom outlets nor intake devices, the sedimentation behaviour is mainly affected by emergency spillway overflow because outflow only takes place when the maximum storage capacity of the reservoir is exceeded. This results in high sediment trapping efficiency values for these small reservoirs. In order to represent an aggregate description of water and sediment budgets in the small reservoirs, a storage approach respecting different reservoir size classes and their interaction via river network is applied. Trapping efficiency and effluent size distribution of small reservoir are computed using a pond performance modelling. Preliminary modelling results indicate that water and sediment fluxes in the Bengue catchment are strongly affected by its high density of small reservoirs.