

An assessment of suspended sediment transport was carried out in a number of semiarid catchments during flood events in order to quantify the degradation rates. In order to quantify these, a systematic sampling procedure of the episodic flood events was proposed for representative catchments. The procedure allows for an integration over the whole run-off episode using both the rising and falling limbs of the run-off hydrograph to compute the sediment quantities for each individual flood event. Higher sediment concentrations occurred in the rising limb than those at the recession for any stage of flow. The maximum suspended sediment concentration was observed at the peak of the flood hydrograph. An integration of the sediment concentration over its duration gave the total sediment yield from the flood event. For the ephemeral channels, only a small number of flood events were observed over a three-year experimental period each with a duration of the order of 3-6 h. It is notable that high sediment loads were associated with high flow volumes which were effectively the result of the catchment characteristics and incident rainfall causing the flood events in the respective catchments. A large percentage of the annual sediment yield from a catchment is transported by the ephemeral streams during a small number of flood events. The correct determination of the total sediment yield from any of the flood events depends entirely on the accuracy of the measurements. The understanding of run-off and sediment loss for the representative catchments aims at assisting planning, management and control of water and land resources for sustainable development in the semi-arid parts of the tropics. The sediment rates reveal the degradation of catchments which have repercussions on the crop and pasture production and this has a bearing on the soil and water conservation programmes in the delicate ecological balance of the semi-arid areas. Further, these rates will determine the lifespan of the reservoirs planned for the dry river valleys (ephemeral streams) and existing ones which serve livestock and domestic needs. These occasionally will require costly rehabilitation and scooping to increase effective storage unless conservation measures are taken, and these measures are bound to vary from place to place as per the representative catchments output.