



1 Suspended sediment yield estimation during storm events in the Mellah catchment, northeast Algeria

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The paper examines suspended sediment yield and its response to catchment disturbance and factors of erosion in the Mellah catchment. Information about the sediment yield estimation has implications for management strategies. Methodologies for establishing the relationships between land cover, climatic and topographic variables with sediment yield are introduced.

For the quantification of erosion, it seemed judicious to propose a method that permits the estimation of the fluxes of sediments exported by Mellah wadi during storm events to give a better comprehension of the sediment transport phenomena and soil erosion. The used method tries to reconstruct missing suspended sediment load sampled from recorded storm event surveys of the period series 1975/76 – 1996/97. This study may help by the analysis of the factors of erosion to understand the variations of suspended sediment transport and its relation to rainfall and runoff.

The surveys of suspended sediment load and water discharge are carried out from the hydro-system outlets in the selected catchment. Before developing sediment rating curves, it was necessary to reconstitute the missing concentration values of the measured storm events using relationships between concentration and instantaneous water discharge. The purpose of using these relationships was to get smaller time increments for the load calculation of the measured storm events and daily discharge/concentration data, and to increase the number of data on an equal time ba-

sis of the events to get relevant data for the individual discharge classes. In addition, many recorded floods show complete missing instantaneous suspended concentration data, due to a lack of continuous sampling, relationships between measured means of sediment concentration and water discharge are applied to develop sediment rating curves.

The reconstruction of missing suspended sediment loads for an important number of storm events has probably reduced the scattering of the plots that have the tendency to underestimate the fluxes of the sediment transport. An attempt has been made to reduce this scatter by subdividing the rating relationship according to rising stage, falling stage and seasonal conditions. The use of the discharge class method and correction for bias in the estimation of the sediment load from storm events has provided good results where calculated values are very close to those predicted.

During the period 1975/76-96/97, the mean annual sediment yield to the outlet of the Mellah wadi is equal to 387 T/km²/year. The Mellah catchment is generally more distinguished by lithologic, climatic and hydrologic conditions to provide more sediment fluxes. Besides the later factors that are important, the catchment seems to be also affected by higher relief energy and a more extended culture practices and sparse grassland developed on clay and marl-rich slopes exceeding 12%. These factors have accentuated the erosion dynamics and soil entrainment during winter and spring seasons.