

## **Study of the relationship between sediment transport and rainfall extremes in the watershed of the wadi Mina (northwest Algeria)**

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**Abstract** Arid and semi-arid areas are characterized, in particular, by the great irregularity of their climate. This irregularity comes out as sporadic, sometimes very important, showers. They can be responsible for erosion and for exceptional sediment transport. The spatial variability of erosion and sediment transport phenomena in North Africa is very high, either because of the intensity of the phenomena or for their consistency. The main factor of these phenomena is the water. Langbein & Schumm (1958) showed how erosion varies according to the annual rainfall. Two factors act antagonistically on erosion: rain and vegetation. To have erosion, it is necessary to have rain. Erosion is an increasing function of the height of annual rainfall. This article aims to analyse and describe the relationships between sediment transport and rainfall extremes. The study was conducted on Mina, a sub-watershed of 6000 km<sup>2</sup> on the left bank of the River Cheliff. The wadi Mina feeds Dam Sidi M'hamed Ben Aouda (SMBA), for agriculture and drinking water supply in the region. This watershed is facing a serious problem of soil degradation, as reported by almost all Western Algerians. This problem causes the rapid siltation of dam Sidi M'hamed Ben Aouda, which has a capacity of 160 million m<sup>3</sup>. This also affects local agriculture, causing huge losses to cropland, forcing farmers to migrate to urban areas. It is interesting to note that before the 1980s, the dam was experiencing the lowest siltation rates in Algeria. Currently, sediment deposits in the reservoir of the dam are very high, and they have doubled in two years. This dam is classified among the most silted dams in Algeria. The study of the basin covers a period of 33 years (1968/69–2000/01).

**Key words** climate; Algeria; Oued Mina watershed; sediment transport; extreme rainfall; silting