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المستودع الرقمي للمدرسة العليا للري



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كل الحقوق محفوظة للمدرسة الوطنية العليا للري.

**Abstract :** The current study focuses on the issue of the decrease in sediment discharge to the Mediterranean Sea by the largest river in Algeria, the Wadi Cheliff (i.e. Cheliff River). This study clarifies the effect of climatic and anthropogenic factors on the changes in the sedimentary dynamics of the Cheliff River discharging to the sea. The data used (rainfall, water discharge, and sediment discharge) concern the Sidi Bel Attar gaging station on the Cheliff River, only 18 km from discharge to the Mediterranean Sea. A power-type statistical regression model was used to fill the 74.2% gap in Suspended Solids (SS) measurements in the establishment of a SS database for the period 1951–2012. The study results show that the transport of suspended sediment discharged to the sea is about  $487 \text{ t/km}^2/\text{yr}$ . Statistical tests of breaks highlight that rainfall decreased by 26% and that water and sediment input to the sea declined from 74% to 63% for the period of 1981–2012. The correlation analysis shows a decrease in the contribution of rainfall on sediment and water input at the outlet equal to 77.9% and 77.8%, respectively, during the period of 1980–2012, compared to the period of 1968–1980. However, the double mass method reflects the contribution of factors other than rainfall to the decrease of sediment input to the sea. These other factors mainly include large dams, which intercepted about 71% of the total volume of sediment discharged to the sea during the period of 1968–2010. In addition the contribution of large dams to the reduction of sedimentary input to the sea is more important than that of the decrease in rainfall. The management of large dams also contributes to the increase in the sediment deficit to the sea through the prioritization of interception of sediment at the expense of releases, for socio-economic purposes, 68.4% of the Cheliff River discharge is diverted for human use. This has led to an increase in the mean water bed level at bankfull downstream, where the Cheliff River gave up 51% of its width to the floodplain between 1996 and 2009. In the light of the scarcity of sediment transport data in North Africa and in many other areas, the current study provides a reference framework for other studies: providing useful information for

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the study of the transfer of sediment from land to sea, and the links with the socio-economic needs.

**Keywords:** Sediment discharge ; Cheliff River ; Algeria ; North Africa ; Dams ; Mediterranean Sea

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