

Several changes have appeared in flow regime in the Medjerda River, especially since the construction of the Sidi Salem dam in Tunisia. These changes are characterised by the narrowing of the cross sections profiles and consequently a remarkable occurrence of floods. Therefore, we are facing a problem of sediment transport in rivers that is closely related to floods. In recent decades, several numerical models were established in order to reduce the flood risk. This paper proposes a hydro-sedimentary model to simulate the evolution of the various hydraulic parameters and the sediment transport rate during the floods, and their effects on river morphological evolution. The model was calibrated using data measured during a major flood event on the Medjerda River in January 2003. The analysis on the results showed satisfactory coherences between the simulations and observations of hydrodynamic parameters. The study proved that results of sediment transport process depend mainly on the hydraulic model calculations.