



Hydro-sedimentary functioning of a contour bunds terracing system
in semi-arid zone (El Gouzine, Central Tunisia)

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This study is concerned with monitoring the water and sediment balances of a contour bunds terracing system. Contour bunds consist of a series of embankments, 1 to 1.5 m high, a base width of 4-5 m. They are built along contour lines at appropriate intervals with an upslope channel which collects totally runoff from the catchment's strip between the bunds. This soil conservation practice is largely used in semi-arid zones.

Few studies are available about the hydrological impact of contour bunds with total retention on the water and sediment balances in North Africa and Middle-East at the hill slope scale.

The study site is located in the catchment area of El-Gouazine in semi-arid region in central Tunisia.

In order to evaluate the effectiveness and the impact of this installation, the hydro-sedimentary balances are established on two different terraced plots: a non-tilled soil (fallow) of 2800 m² and a tilled soil of 2900 m². A hydrometric station was installed in the collect channel of each of the two plots. A rain-gauge recorder was installed between the two plots. The monitoring of erosion was carried out by the topographical levelling in each channel following the principal rainy events to quantify the accumulated sediments.

During the period 2004-2006, 970 mm of rainfall were recorded. The measured runoff was 259 mm on the fallow plot, but only 67 mm on the tilled plot. The runoff coefficients were 27 and 7% respectively.

After one year of measurement, the observed erosion was 24 t/ha on the fallow plot

and 15 t/ha on the tilled plot. The erosion reported to millimetre of rain is practically twice on the fallow plot. On the contrary, reporting erosion to millimetre of runoff the reverse is observed. Indeed, although the ploughing weakens the soil, it limits erosion by increasing the infiltration.

This study showed the importance of the mode of land use on the runoff and erosion processes. The measurements also allowed obtaining input data to model the processes of infiltration, runoff and soil erosion in a contour bunds terracing system.

Key words: *contour bunds, semi-arid region, runoff, erosion, central Tunisia.*