



## **Hydrological modelling of soil degradation processes and derived effects under different climate and land management scenarios**

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Soil and land degradation have a negative effect on plant productivity and environmental quality. Natural disasters by droughts, flooding, landslides and sedimentation, affecting with growing incidence mostly the developing countries, are also rooted in soil degradation. The problems of soil and water degradation and derived effects are increasing throughout the World, partially due to a lack of appropriate identification and evaluation of the degradation processes and of the relations cause-effects for each specific situation. The processes of soil degradation are closely linked through unfavorable alterations in the hydrological processes determining the soil water balance and the soil water regime. They are also conditioned by the climatic conditions and by the use and management of the soil and water resources. In this presentation there is proposed a hydrological approach to evaluate soil degradation processes and their effects, based on the integration of soil hydraulic parameters and hydrological processes, as influenced by climate, land management and soil conservation practices. It can be applied at different scales to predict processes of surface and mass erosion, soil salinization, and derived catastrophic effects like droughts, flooding, landslides and sedimentation. This modelling approach, non empirical and based on processes, has been tested, validated and used in different climates, soils, topography and land use and management, mainly under tropical and mediterranean conditions. There are presented the last version of the model, including the required parameters to be evaluated in situ using simple and practical methodologies, and examples of cases where it has been used.

**Key words:** Soil degradation, modelling, hydrological processes, natural disasters