

Development of a mobile application based on RUSLE model to predict erosion in olive groves

Víctor Javier Marín Moreno, María Dolores Redel, and Encarnación V. Taguas

University of Córdoba, Rural Engineering, Córdoba, Spain (o02mamov@uco.es, mdredel@uco.es, evtaguas@uco.es)

Environmental impact of agriculture in fragile areas such as the Mediterranean Basin due to its scarcity and/or variability of water resources or to their susceptibility to soil erosion may be extremely damaging. Over 96% of the world's olive oil is produced in Mediterranean countries (FAOSTAT, 2014). Suitable managements and environmental evaluations of the conditions in olive cultivation farms is of major relevance for countries such as Spain, particularly in Andalusia (in Southern Spain) with an olive orchard area of 1.5 Mha (CAP, 2016).

The average erosion rates in olive orchard in Southern Spain are approximately $19 \text{ tons}\cdot\text{ha}^{-1}\cdot\text{year}^{-1}$. It is worth noting how 23% of this surface presents high or very high erosion rates with values over $50 \text{ tons}\cdot\text{ha}^{-1}\cdot\text{year}^{-1}$ (Areal, 2014). Most of farmers implement soil conservation practices only when have they perceived high erosion risk (Franco, 2011; Taguas and Gómez, 2015). On the other hand, technicians also require proper technological tools to evaluate in a straightforward way, soil loss risk in the field. Simple tools integrated into smartphones may enable us to evaluate soil erosion rates through minimum information; which would be a great help in raising farmer awareness as well as in environmental control.

In this work, the preliminary version of RIESGO (Risk Index for Erosion Soil in Olive Groves) , -an APP mobile based in SECO (Soil Erosion Calculator in Olives; Marín-Moreno et al. 2013) that promises broad functionality to identify soil loss risk in the field,- is presented. Features such as simple screens, a reduced group of input data, calculations for R and K factors based on environmental information of Andalusia which are identified from geographical coordinates and a new method of obtaining factor C from empirical data have been integrated to fit its use in the field. RIESGO is and hybrid application which was programmed by using web technologies HTML, CSS and JavaScript, and built with Visual Studio Tools for Apache Cordova, which are very efficient to facilitate its implementation in most of mobile platforms. The first evaluations from farmers and technicians are also presented in order to improve the first version.

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