A century of gully erosion research: Urgency, complexity and study approaches

C. Castillo, J.A. Gómez

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A century of gully erosion research: urgency, complexity and study approaches

C. Castillo[1*], J. A. Gómez[2].

1 University of Cordoba, Dep. of Rural Engineering, Campus Rabanales, Leonardo Da Vinci Building, 14071 Cordoba, Spain.

2 Institute for Sustainable Agriculture. CSIC. Avenida Menéndez Pidal S/N. 1004 Cordoba Spain. *Corresponding author (ccastillo@uco.es)

Abstract

Gully erosion has become a field of growing interest among the research community but there still are numerous knowledge gaps that need to be addressed. The aim of this work is to carry out a systematic review on significant trends in gully erosion research included in the Web of Science database in order to evaluate the survey methodologies, evaluate the impact of key factors on the complexity of gully erosion responses and raise public awareness of this urgent environmental issue. Gully erosion represents at present around 10% of soil erosion research, a percentage that is at odds with being the worst form of soil degradation in agricultural areas. Despite the fact it is an ubiquitous process all around the world, the worst stages of degradation take place where unsustainable human practices operate in erosion-prone conditions such as erodible soils, soft lithologies or geotechnically instable slopes. Anthropic influence is typically the main driver of gully erosion evolution and has acted differently in time and results across the countries depending on the history of land use and management practices. Although gully erosion is known to be largely controlled by deep-profile properties, the study on subsurface processes has frequently remained mostly descriptive and it is