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# Cost analysis of gully restoration in agricultural areas in Andalusia (Spain)

Carlos Castillo (1), Encarnación Taguas (2), Jose Mora (3), and Jose Alfonso Gómez (1)

(1) Institute for Sustainable Agriculture. CSIC. Apartado 4084. 14080 Cordoba Spain., (2) Rural Engineering Department. University of Córdoba. Campus Rabanales. Leonardo Da Vinci building. 14071 Córdoba (Spain)., (3) Enviromental Department. Ayuntamiento de Córdoba. Avda. Linneo s/n. 14071 Córdoba (Spain).

Cost optimization of soil conservation measures is essential in the agricultural sector where the farmers return of investment is usually small, and there is a high degree of uncertainty about yield. The main aims of this study are: 1) to assess the cost of check dams and revegetation measures for a wide range of situations on gully networks of Andalusia and 2) provide an estimation of the adequate budget requirements for the gully restoration at farms included in the public Incentive Program for Gully Control (IPGC) supported by the Junta de Andalucia (Spain). Firstly, a study was conducted to design the structures adapted to a wide variety of gully conditions (slope, width, height, unitary discharge) in the region of Andalusia, and check dam materials (concrete and gabions) taking into account conventional engineering stability criteria, recommendations in technical literature (Gómez et al., 2011) and principles of energy dissipation maximization (Castillo, 2012). In addition, the cost of the conservation measures was estimated by using current market prices of local resources (for interventions with farmers own means) and national construction prices list (if the works were hired to an external company). The cost of the interventions was expressed as a multivariate function of the gully characteristic by means of regression analysis to facilitate its use for budget estimation purposes. Finally, these equations were applied to the farms included in the IPGC database to provide an estimation of the adequate budget required for a successful implementation of this initiative, as well as to propose unitary indexes (i.e. cost per gully meter in the longitudinal profile or per square meter in plan view) that could serve as useful criteria for this, or future programs, to allocate resources to individual farms based on specific characteristics of the gully erosion problems they suffer.

References

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