Variability of RUSLE Factor K in grasslands from high mountain environment (Sierra de las Nieves, southern Spain

Martínez-Murillo, J.F. ; Menjíbar-Romero, Mario.

Habitat, Territory and Digitalisation Institute – IHTD; Department of Geography. University of Málaga, Málaga, Spain.

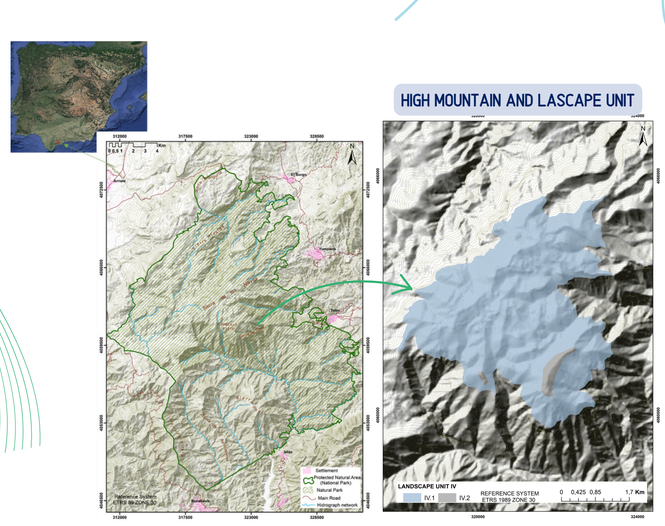
(mariomenjibar@uma.es; jfmmurillo@uma.es)

INTRODUCTION

In one Mediterranean high mountain environment (Sierra de las Nieves, southern Spain), this study deals with the calculation of the RUSLE Factor K in grassland soils with different degrees of degradation due to grazing and water erosion. Also, Factor K is determined for badland materials as final stage of grassland degradation. To do this, soil surface conditions is described in three different types of grassland: non-degraded, semi-degraded, and degraded, besides in badland surface material. 10-soil samples from 0-10 cm of depth are taken in all of them to analysis in laboratory: bulk density, texture, organic matter content, permeability, and aggregate stability fraction. Finally, the Factor K is calculated based on the soil data.

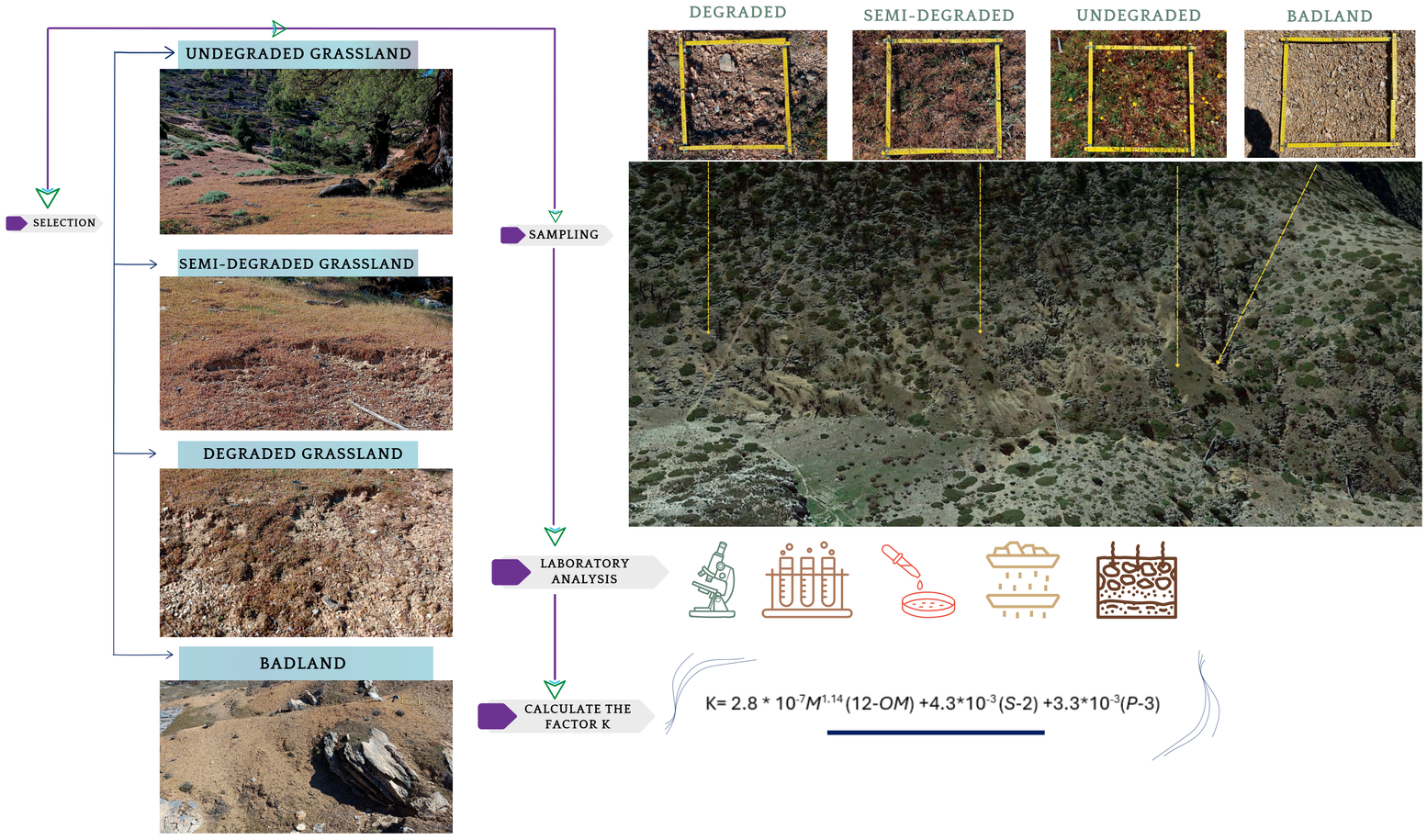
STUDY AREA AND OBJETIVE

The study area is located in the highest part of the Sierra de las Nieves National Park. These grassland are located above 1.700 m.a.s.l., are related to the presence of marly bedrock where shrub cover is less than 50%, mainly, because of the coat and sheep grazing activity is not intensive. It is characterised by high mountain landscapes, limestone, structural and with the presence of a semi-continental Mediterranean cllimate, forest.

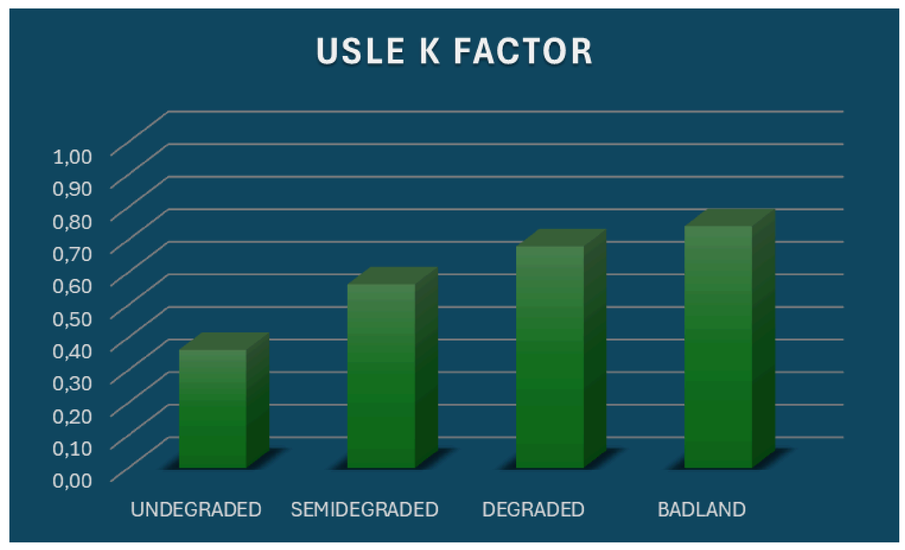


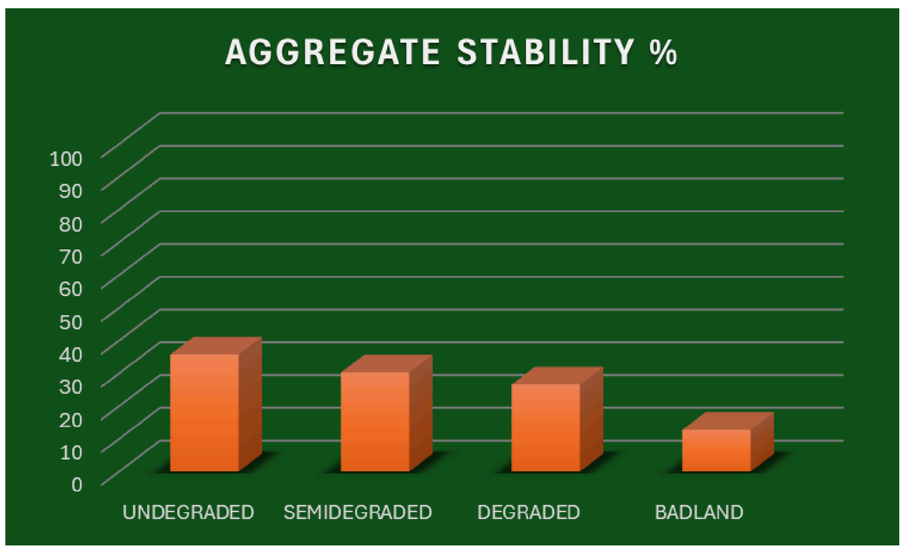
To evaluate soil erodibility in different degrees of degradation in Mediterranean high mountain grasslands and its relationship with soil aggregate stability, using the Factor K of the RUSLE equation as an indicator

MATERIALS AND METHODS



RESULTS





SOIL PROPERTIES	UNDEGRADED		SEMIDEGRADED		DEGRADED		BADLAND	
	mean	±SD	mean	±SD	mean	±SD	mean	±SD
Bulk Density	1,0	0,2	1,1	0,1	1,0	0,15	1,2	0,02
OM	8,3	1,7	5,1	0,7	3,5	0,49	3,3	0,4
Permeability	5,10	0,3	5,2	0,4	2	0,6	1,75	0,5
Structure	1,90	0,3	1,8	0,4	2	0,6	0,5	0,5

CONCLUSIONS

- The results show a declining trend and significant differences between the sampled grassland and badland material: undegraded 0.36±0.14, semi-degraded 0.56±0.13, degraded 0.68±0.12, and badland material 0.74±0.05.
- These significant differences are not achieved regarding mean aggregate stability fraction: undegraded 35.8±10.5%, semi-degraded 30.3±7.9%, degraded 26.6±8.6%, and badland material 12.8±9.0%.
- Although the non-degraded grassland shows one Factor K indicating very low soil erodibility compared to the others and badland material, the aggregate stability data highlights a very fragile environment.
- Thus, when grassland is impacted by an increment in grazing activity and/or water erosion, it may become easily degraded. These results are key to improve the land management as the study are within a remarkable national park of outstanding ecosystems.

REFERENCES

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