

The effect of aggregates stability and physico-chemical properties of gullies' soil: a case study of Ghori-chai watershed in the Ardabil province, Iran

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ABSTRACT:

Soil erosion, "particularly gully erosion" is considered as the most important factors of land degradation in semi-arid regions, since Iran is located in a semi-arid region, it is highly susceptible to degradation and erosion. The current study done on land was exposed to erosion in the Ghori-chai watershed, Ardabil province. In order to know the soil samples, they were collected from the gully heads of two depths (0-30, 30-60 cm) (the active points of gullies). Physico-chemical properties of soil samples were analyzed in the field and laboratory. GMD (Geometric Mean Diameter) and MWD (Mean Weight Diameter) factors were used to determine the sensitivity of the gullies' soil to erosion. Using the statistical software R, multivariable regression, and simple linear stepwise regression were applied in order to determine the relationship between soil physico-chemical properties and aggregates stability. Chi-square was used to compare parameters and differences test. Aggregate stability was low on the gullies land, and soil stability has severe and very severe limitations in this region. However the considerable organic carbon is a positive factor in aggregates stability, but high SAR (Sodium Absorption Ratio) and unsuitable land use have recognized to aggregates instability. The amounts of SAR and OM (Organic Matter) and silt/(clay+sand) also were analyzed in both the depths and showed that the amount of SAR and OM have significant alternation (changes) in various depths and gullies. However, the amounts of MWD did not show any significant alternation in deeps and gullies.

Keywords:

Aggregate stability, Geometric Mean Diameter (GMD), Mean Weight Diameter (MWD), Soil sensitivity, R software.