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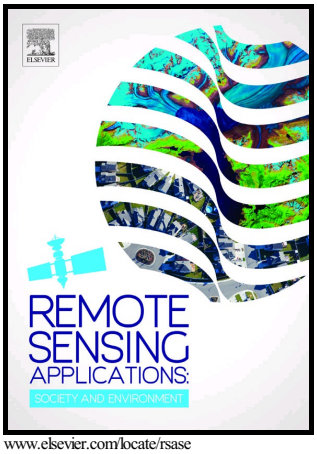

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Mapping Man-induced Soil Degradation in Armenia's High Mountain Pastures through Remote Sensing Methods: a case study

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The research goal was measuring the precision of linear spectral unmixing (LSU), and NDVI-SMA methods applied to QuickBird imagery, estimating soil surface components related to degradation (fractional vegetation cover-FVC, bare soils fractions, surface rock cover) and determining the appropriateness of these methods for mapping man-induced soil degradation in Armenia's highland pastures. The accuracy assessment was done by comparing between RS derived land cover abundance and the ground truth data. Significant regression was established between ground truth FVC and both NDVI-LSU and LSU - produced vegetation abundance data (R^2=0.636, R^2=0.625, respectively). For bare soil fractions, linear regression produced a general coefficient of determination R^2=0.708. Because of poor spectral resolution of QuickBird imagery LSU failed with the surface rock abundance (R^2=0.015) assessment. The outcomes show that the proposed method of man-induced soil degradation assessment through FVC, bare soil fractions, and field data adequately reflects the current status of soil degradation throughout the studied pasture site.

Keywords: Armenia, linear spectral unmixing, overgrazing, remote sensing, QuickBird, soil degradation.

1. Introduction

One of the major causes of highland pasture degradation is mismanagement and irrational and scientifically inappropriate utilization of pastures (Dobrovolskiy 2002, Zhang *et al.* 2013). According to FAO data, some 20% of pastures across the world have been damaged by overgrazing (FAO 1996). Soil