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Differentiation of drylands cereal and rangelands with the assistance of remote sensing techniques

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ABSTRACT

Remote sensing is collection of data from earth surface features without physical contact. It may include aerial photos and satellite imagery. The great advantage of satellite images is that data available in digital form, so that can be processed by computer. One of the major procedures in achieving timely figure of land use is application of remote sensing which help rapid assessment of the land use in a GIS environment.

According to reports, the problem range managers face is impossibility of distinguish between dry land farming and the rangeland, as the reflectance between rainfed agriculture and rangeland are the same. One solution is usage of temporal images, i.e. times that reflectance between these two features is high. For the experiment rainfed cereal farms and rangelands in Taham region of Zanzan province, characterized as a semi arid area, was selected.

Crop calendar (seeding, sowing, harvesting) of rainfed crop was drawn. Outstanding dates, over which differences between natural vegetation and crops was high, were distinguished. Corresponding Landsat ETM images, 8 August 2002, and IRS images (multi-spectral and panchromatic), 16 October 2002, were used. Images were georeferenced using available topographic map to a Universal Transverse Mercator projection using control points. For preparation of base map (ground true) IRS panchromatic images were interpreted and land use map was made through digit screen checking boundaries of the map lead to preparation of the final map.

Via Image Classification Techniques, supervised (maximum likelihood and Box classification), unsupervised and principal components analysis were

used to create a map. The maps were overlaid on base map (ground true) and accuracy of classified map was assessed. The result showed that it is not possible to distinguish between dry land farms and rangeland with the assistance of image classification technique, in panchromatic images however dry lands could be easily distinguished through the pattern, shape and texture found on images.

Key words: Remote sensing, satellite image, rain-fed agriculture, rangelands, semi-steppe, Zanzan Province