Using remote sensing data for vegetation cover assessment in semi-arid rangeland of center province of Iran

ABSTRACT

To determine suitable indices for vegetation cover and production assessment based on remote sensing data, simultaneous digital data with field data belonged to summer rangeland of southern part of Isfahan province were analyzed. During 2 years of monitoring, annuals, grasses, forbs and shrubs vegetation cover and total production data from sixty 1 square meter plots in each site were collected. The Global Positioning System (GPS) was used to measure coordinates of plots and transects. Geometric correction and histogram equalization were applied in image processing and image digital numbers were converted to reflectance numbers. In the next stage, all vegetation indices were calculated from ASTER (Advanced Spaceborn Thermal Emission and Reflection Radiometer) image data and compared with vegetation cover estimates at monitoring points made during field assessments. A linear regression model was used for selecting suitable vegetation indices. The results showed that there are significant relationships between satellite data and vegetative characteristics. Among indices, NDVI vegetation index, using high infrared and low red ASTER bands, consistently showed significant relationships with vegetation cover. Estimation of vegetation cover with NDVI vegetation index was more accurate predicted within rangeland systems. Using produced model from NDVI index vegetation crown cover percentage maps were produced in four classes percentage for each image. Generally introduced indices, provided accurate quantitative estimation of the parameters. Therefore, it is possible to estimate cover and production as important factors for range monitoring using ASTER data. Remote sensing data and Geographic Information System are most effective tools in natural resource management.

Keyword: Rangeland; Remote sensing; Vegetation cover; Production; Vegetation index; Monitoring; Semi-arid rangeland