

**Investigate the Capability of IRS-P6-LISS III data for Pistachio forests density mapping
(Case study: Khaje kalat forest in Khorasan Razavi province)**

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Abstract

In order to investigate the capability of satellite images for Pistachio forests density mapping, IRS-P6-LISS III data with 5 spatial resolution images, dated 2007 were analyzed. This study were done in area with 500 ha in Khaje Kalat pistachio forest of Khorasan Razavi province. The radiometric and geometric quality of the images was evaluated. There wasn't any noticeable radiometric error. The geometric correction of images was implemented using 1 control points extracted from another corrected image of study area. The RMS error was less than one pixel (0.63). In addition to original bands, some synthetic bands from principal component analysis and transformation methods were created and used. In order to assess the accuracy of classification results, a ground truth map inclusive 34 areas 1 ha with random systematic dispersion were create and canopy percent of trees in density classes 0-5%, 5-10%, 10-15%, 15-20% and more than 20% was estimated on ground.

Classification of Satellite data were done by different methods of hard supervised classification (minimum distance to mean (MD), maximum likelihood (ML)) and soft classification method (fuzzy) with 5 density classes. Because of low separability between some classes, this classes were merged and classification were repeated . Finally, the highest overall accuracy and kappa coefficient, 70% and 0/45, respectively, were obtained with three classes (0-5%, 5-20% and > 20%) by fuzzy algorithm. Second density class (5-20%) represented highest kappa coefficient equal 0/60.

It could be concluded that regard to low kappa, even if reaching to pretty good overall accuracy, the result of classification was not desirable. To obtain a better result, it is suggested using higher spectral resolution data and preparing fieldwork in more area and with smaller sample area .