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## Capability Assessments of Landsat Satellite Data for Vegetation Cover Monitoring (Case Study: Lar Dam Basin)

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## Capability assessments of Landsat satellite data for vegetation cover monitoring (case study : Lar Dam Basin)

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**Key words :** vegetation cover, monitoring, Landsat 7 ETM+, Lar Dam Basin

**Introduction** Resources assessment using traditional methods is usually time-consuming and expensive. Also high speed of nature dynamism forced specialists to seek for quick and precise methods. Remote sensing and GIS are kinds of new technologies. We used Landsat 7 ETM+ data to monitor this dynamism in a semi-steppic region of Iran.

**Materials and methods** Landsat 7 ETM+ satellite data of 2002 and also vegetation cover map of 1976 were used for capability assessment of satellite data for preparing vegetation cover categories map and also vegetation monitoring in an area of about 27000 ha in Lar Dam Basin.

Sample points were selected after needed corrections. Appropriate band compositions were selected by paying attention to Optimum Index Factor (OIF), correlation matrix, Principal Components Analysis (PCA) and 2-dimensional diagram analysis. These compositions were classified using Maximum Likelihood, Minimum Distance and Box Classifier algorithms and then Majority Filter was applied. Accuracy of resulted maps was evaluated by pixel to pixel method. Then Overall Accuracy Coefficient and Kappa Index were calculated. By considering these indices, the map resulted from classification of band composition 123457 with method of Maximum Likelihood and applying Majority Filter was selected as the vegetation cover map of 2002. Vegetation cover map of 1976 was used as the vegetation cover map of 1976. Then the changes happened in different categories was detected.

**Results and discussion** Results showed that 28.55% of total area covered by range types in 1976 was unchanged, 14.03% was decreased to lower categories and 57.42% increased to higher ones. Table 1 shows amounts of change in each category. When we decreased our cover categories from 16 to 4, we observed different amounts of change in the mentioned period and also Overall Accuracy and Kappa indices were promoted. The map of vegetation cover changes was prepared, finally.

**Table 1** Amounts of change in cover categories.

Category (%)	Area at 1976 (ha)	Area at 2002 (ha)	Change
0-25	0.0	1529.5	1529.5
26-50	18878.1	5729.9	-13148.2
51-75	301.5	11001.7	10700.2
76-100	1790.1	2708.6	918.5

**Conclusions** We reached to acceptable amounts of Overall Accuracy and Kappa indices in this classification and it could be concluded that ETM+ data are suitable for vegetation cover monitoring in similar conditions. As stated before, when we decreased number of categories, amounts of cover fluctuations and accuracy of resulted maps were changed, as other authors like Darvish Sefat (1998) and Alavi Panah (2000) pointed out. Therefore, we have to pay a serious attention to precisely and accurately definition of categories for classification of satellite data.

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