

## Determination of Potential Agricultural Lands Using Landsat 8 OLI Images and GIS: Case Study of Gokceada (Imroz) Turkey

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**Abstract :** In present study, it was aimed to determine potential agricultural lands (PALs) in Gokceada (Imroz) Island of Canakkale province, Turkey. Seven-band Landsat 8 OLI images acquired on July 12 and August 13, 2013, and their 14-band combination image were used to identify current Land Use Land Cover (LULC) status. Principal Component Analysis (PCA) was applied to three Landsat datasets in order to reduce the correlation between the bands. A total of six Original and PCA images were classified using supervised classification method to obtain the LULC maps including 6 main classes ("Forest", "Agriculture", "Water Surface", "Residential Area-Bare Soil", "Reforestation" and "Other"). Accuracy assessment was performed by checking the accuracy of 120 randomized points for each LULC maps. The best overall accuracy and Kappa statistic values (90.83%, 0.8791% respectively) were found for PCA images which were generated from 14-bands combined images called 3-B/JA. Digital Elevation Model (DEM) with 15 m spatial resolution (ASTER) was used to consider topographical characteristics. Soil properties were obtained by digitizing 1:25000 scaled soil maps of rural services directorate general. Potential Agricultural Lands (PALs) were determined using Geographic information Systems (GIS). Procedure was applied considering that "Other" class of LULC map may be used for agricultural purposes in the future properties. Overlaying analysis was conducted using Slope (S), Land Use Capability Class (LUCC), Other Soil Properties (OSP) and Land Use Capability Sub-Class (SUBC) properties. A total of 901.62 ha areas within "Other" class (15798.2 ha) of LULC map were determined as PALs. These lands were ranked as "Very Suitable", "Suitable", "Moderate Suitable" and "Low Suitable". It was determined that the 8.03 ha were classified as "Very Suitable" while 18.59 ha as suitable and 11.44 ha as "Moderate Suitable" for PALs. In addition, 756.56 ha were found to be "Low Suitable". The results obtained from this preliminary study can serve as basis for further studies.

**Keywords :** digital elevation model (DEM), geographic information systems (GIS), gokceada (Imroz), LANDSAT 8 OLI-TIRS, land use land cover (LULC)

**Conference Title :** ICASTE 2015 : International Conference on Agricultural Science, Technology and Engineering

**Conference Location :** Venice, Italy

**Conference Dates :** August 13-14, 2015