Exploitation of TerraSAR-X Data for Land use/Land Cover Analysis Using Object-Oriented Classification Approach in the African Sahel Area, Sudan.

ABSTRACT

Recently, object-oriented classification techniques based on image segmentation approaches are being studied using high-resolution satellite images to extract various thematic information. In this study different types of land use/land cover (LULC) types were analysed by employing object-oriented classification approach to dual TerraSAR-X images (HH and HV polarisation) at African Sahel. For that purpose, multi-resolution segmentation (MRS) of the Definiens software was used for creating the image objects. Using the feature space optimisation (FSO) tool the attributes of the TerraSAR-X image were optimised in order to obtain the best separability among classes for the LULC mapping. The backscattering coefficients (BSC) for some classes were observed to be different for HH and HV polarisations. The best separation distance of the tested spectral, shape and textural features showed different variations among the discriminated LULC classes. An overall accuracy of 84 % with a kappa value 0.82 was resulted from the classification scheme, while accuracy differences among the classes were kept minimal. Finally, the results highlighted the importance of a combine use of TerraSAR-X data and object-oriented classification approaches as a useful source of information and technique for LULC analysis in the African Sahel drylands.