

An Assessment of the Efficiency of Landsat, Nigeriasat-1 and Spot Images for Landuse/Landcover Analysis in Ekiti West Area of Nigeria

Adebayo Ojo

African Regional Centre for Space Science and Technology Education, Ile-Ife, Nigeria

Adesina, F. A.

Abstract. Several remote sensing data types are now available for environmental studies. The variety has increased as many nations including some African countries to invest in satellite remote sensing. However, each data type has its own peculiar features that may limit or enhance its relevance to capture for specific range of information. This study used geo-information techniques based on multi-source imageries to enhance the utilization of images with coarser resolutions in landuse analysis in Ekiti west area of south western Nigeria. The objective of the study is to evaluate the variations in landuse characterization with multi-source satellite data sets. The remotely sensed data sets used included Landsat TM 1986, SPOT XS 1995 and NigeriaSat-1 2007 satellite images. To make the images comparable, they were georeferenced, re-sampled and enhanced for visualization in a GIS environment. The tonal values recorded in the images with the features on the ground were validated by ground truthing. The data from ground truthing were combined with visual image interpretation for “supervised” classification. The classes defined and analyzed included “built-up area”, “bare rock”, “farmland”, secondary forest regrowth” and “water body”. The results show that each image has certain relative advantage over the other. For instance, while NigeriaSat-1 image was efficient in the analysis of information within the visible portion of the electromagnetic spectrum, SPOT image was better in the Near Infrared. Information from Landsat image was rather weak at both portions (Visible and NIR) of the Electromagnetic Spectrum. The study also shows that SPOT image has the lowest level of data redundancy of the three image providers. The study confirms the relevance of the growing interest in the use of geo-information techniques for landuse analysis. landuse; accuracy assessment; Landsat TM; SPOT XS; NigeriaSat-1 and classification