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LAND COVER MAPPING AND CHANGE DETECTION FOR THUMA AREA, MALAWI

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ABSTRACT

The study was conducted in Thuma area in central Malawi. The main objective was to produce land cover maps for the years of 1997, 2007 and 2017, and detect land cover change of the area. The study was carried out by using Remote Sensing and GIS, focusing on analysis of Landsat 5 ETM and Landsat 8 ORI/TIRS satellite images from 1997, 2007 and 2017 supported by ground truth data from the field. ArcMap 10.5 and QGIS 3.0 were the main software employed. The methodology involved; sourcing Landsat imagery from the before mentioned years, classifying images based on the composite bands using unsupervised and supervised classification, development of training areas was based on ground truth data and results from unsupervised classification. The classification was conducted for the following distinct classes; closed forest, open forest, shrubland, savannah grassland, agriculture fields, and water. An accuracy assessment was conducted for the results of the classification. After the three classified maps were produced, change detection algorithm was conducted to quantify changes in each class. The study revealed that closed forest is diminishing at alarming rate, from 19% in 1997 to 10% in 2007 to 6% in 2017. In addition, the study showed that there was a general increase in agriculture and savannah grassland area, from 37% in 1997 to 51% in 2007, to 64 % in 2017.