

ABSTRACT

We explore the potential contribution of Sentinel-2 (S2) wavebands and biophysical parameters, i.e. Leaf Area Index (LAI), Chlorophyll content (Cab), Fraction of Absorbed Photosynthetically Active Radiation (FAPAR), Fraction of Vegetation Cover (FVC) and Canopy Water Content (CWC) in mapping land use and land cover (LULC) in Zimbabwe. Random forest (RF) and naïve Bayes (NB) were used to classify S2 imagery. S2 biophysical variables resulted in LULC overall accuracy (OA) of 96% and 86% for RF and NB respectively, whereas S2 wavebands produced slightly higher accuracies of 97% and 88% for RF and NB respectively. Combining wavebands and biophysical variables enhanced classification results (OA = 98%: RF and 91%: NB). Variable importance analysis showed that FAPAR, red-edge 2, green, red-edge 3, FVC and band 8a, are the most relevant in the classification. Our work shows the strength and capability of biophysical variables in discerning different LULC attributes in semi-arid environments.