A NOVEL APPROACH TO ESTIMATE LAND SURFACE TEMPERATURE USING SUBPIXEL VEGETATION, SOIL AND IMPERVIOUS FRACTION FROM LANDSAT 8 IMAGERY

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Land Surface Temperature (LST) is an important parameter in many aspects of the Geosciences mainly to get an Overall understanding of land-surface processes at different scales. The impact of Biomass burning (Forest fires at Belihuloya Sri Lanka, Amazon Rain forest fires) affects the Vegetation land cover fraction and the estimation of LST. Thermal remote sensing is sensitive to objects temperature and emittance depending on the wavelength. Further it also provides regional and global coverage at good temporal and spatial resolutions. In this study Landsat 8, TIR band 10 was used to estimate brightness temperature. In the standard process the bands 4 and 5 were used for vegetation and soil fraction estimation using NDVI. Here 0.5 and 0.2 thresholding were applied to deduce the proportions of vegetation and soil respectively. The NDVI estimation for vegetation and soil highly depend on atmospheric conditions this thresholding process is doubtful in the determination of top of atmosphere (TOA) reflectivities. In the proposed method the subpixel estimation for Vegetation, Soil and Impervious class fractions were carried out using Spectral Angel Mapper (SAM) classification. SAM is free of atmospheric effects. Further a thresholding process will not be required as all the pixels are decomposed into fractional estimation of the V-I-S in the range 0 to 1. V-I-S endmembers was carried out by using supervised clustering of n-D scatterplots using multispectral bands of the Landsat 8 sensor. Test were run using low medium and high sample areas with respect to the V-I-S classes. Class separability indexes (TD and JM) were employed to minimize mixture. The improvements are presented with the comparison of the NDVI based standard estimation. Ground sampled based validation is at the experimental stage. Time series LST estimation using Bayesian mechanism to predict the LST changes is the final aim of the present work.

Keywords: *Landsat 8, LST, SAM, Proportion V-I-S, Subpixel*