

Monitoring Soil and Vegetation Moisture using Normalized Multi-band Drought Index (NMDI) Dervied From Landsat-8 Imagery and QGIS Over the Barind Tract of Bangladesh
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Drought is undoubtedly a tremendous natural hazard resulting in calamitous reduction in crop production including the fertility of soil as well as the water content. The north western region of Bangladesh is a severe drought prone area with a great extent of temperature during summer that facilitates frequent evaporation and evapotranspiration of the soil leading to agricultural drought. Multiple band data from Landsat 8 had been utilized to derive the normalized multi-band drought index for monitoring the drought events and the intensity of drought from 2013 to 2018 over Barind Tract. The study had indicated the year 2016 as the maximum and minimum value holder of NMDI for vegetation moisture while the years 2016 and 2018 had been the maximum and minimum value holders of soil moisture NMDI respectively. The study has been carried out on the Barind Tract of Bangladesh located at the north western region. The Landsat 8 data had been downloaded from U.S. Geological Survey (USGS) Earth Explorer (<https://earthexplorer.usgs.gov/>) having the Worldwide Reference System (WRS) defined nominal Landsat satellite track (path) 138 and nominal Landsat satellite row 43 from 2013 to 2018. The data was processed in QGIS, an open source Geographic Information System software according to the formula of Normalized Multi-Band Drought Index (NMDI) for vegetation and soil moisture as follows,

$$NMDI(vegetation) = \frac{Band5 - (Band6 - Band7)}{Band5 + (Band6 - Band7)}, \text{ and}$$

$$NMDI(soil\ moisture) = 0.9 - \frac{Band5 - (Band6 - Band7)}{Band5 + (Band6 - Band7)}$$