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Monitoring crop land greening and degradation using remotely sensed MODIS time-series data

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The management of crop land is crucial to sustain the food productivity in developing country like India. Manual monitoring of crop condition is difficult and time consuming in a large river basin. The phenological study is essential to understand changes in crop growth stages. This study is an attempt to monitor land greening and degradation, and to derive phenological parameters of crop land area using remotely sensed MODIS Normalized Difference Vegetation Index (NDVI) time-series data of the years 2001-2013 for the Betwa river basin, Central India. Savitzky Golay filtering method was employed to de-noise NDVI time-series data using TIMESAT software. Seven phenological parameters (start of the season, end of the season, length of the season, base value, peak time, peak value and amplitude) were obtained for the crop land area. Furthermore, spatial analysis was carried out to identify changes in crop land areas. Result shows that more land greening and degradation have been occurred for crop land and natural vegetation area respectively. This study revealed that remote sensing data based analysis will help to secure the food productivity in a large agricultural river basin.