

Analysing Trends in Rice Cropping Intensity and Seasonality across the Philippines Using 14 Years of Moderate Resolution Remote Sensing Imagery

Authors : Bhogendra Mishra, Andy Nelson, Mirco Boschetti, Lorenzo Busetto, Alice Laborte

Abstract : Rice is grown on over 100 million hectares in almost every country of Asia. It is the most important staple crop for food security and has high economic and cultural importance in Asian societies. The combination of genetic diversity and management options, coupled with the large geographic extent means that there is a large variation in seasonality (when it is grown) and cropping intensity (how often it is grown per year on the same plot of land), even over relatively small distances. Seasonality and intensity can and do change over time depending on climatic, environmental and economic factors. Detecting where and when these changes happen can provide information to better understand trends in regional and even global rice production. Remote sensing offers a unique opportunity to estimate these trends. We apply the recently published PhenoRice algorithm to 14 years of moderate resolution remote sensing (MODIS) data (utilizing 250m resolution 16 day composites from Terra and Aqua) to estimate seasonality and cropping intensity per year and changes over time. We compare the results to the surveyed data collected by International Rice Research Institute (IRRI). The study results in a unique and validated dataset on the extent and change of extent, the seasonality and change in seasonality and the cropping intensity and change in cropping intensity between 2003 and 2016 for the Philippines. Observed trends and their implications for food security and trade policies are also discussed.

Keywords : rice, cropping intensity, moderate resolution remote sensing (MODIS), phenology, seasonality

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