



Decadal monitoring of rice farming practices from MODIS data in Myanmar

Nguyen Thanh Son (1), Chi Farn Chen (2), and Cheng Ru Chen (3)

(1) National Central University, Center for Space and Remote Sensing Research, Jhongli, Taiwan (ntsonait@hotmail.com), (2) National Central University, Center for Space and Remote Sensing Research, Jhongli, Taiwan (cfchen@csrsr.ncu.edu.tw), (3) National Central University, Center for Space and Remote Sensing Research, Jhongli, Taiwan (ccruapes@gmail.com)

Rice agriculture was the most important sector in Myanmar's economy because it provided employments and livelihoods for at least 75% of the country's population, accounting for more than 48% of the national gross domestic product. Prior to the World War II, this country was the largest rice-producing nation in the world. However, it is currently a relatively minor rice exporter, ranking seventh after Thailand and Vietnam. The country's rice export potential remains high due to abundant land and water resources along with recent indications of progressive policy reforms to improve rice productivity. This study aimed at investigating decadal changes in rice farming practices in Myanmar during 2001 to 2014 using Moderate Resolution Imaging Spectroradiometer (MODIS) data. We processed the data through three main steps: (1) data pre-processing to construct the smooth time-series MODIS enhanced vegetation index (EVI) data, (2) mapping rice farming practices using phenological information of crop phenology, and (3) accuracy assessment. The mapping results were compared with the ground reference data indicated satisfactory results, with the overall accuracies and Kappa coefficients generally higher than 90% and 0.8, respectively. These results were reaffirmed by comparisons between MODIS-derived rice area and the government's rice area statistics, with a close correlation between the two datasets ($R^2 > 0.8$) and the relative error in area smaller than 15%. From 2001 to 2014, rice farming practices in Myanmar had remarkably changed from single-cropped rice to double-cropped rice, especially in Ayeyarwady river basin. This study demonstrates the validity of the phenology-based approach for national-wide monitoring of decadal changes in rice farming practices in Myanmar. Such a quantitative information might be useful for agronomic managers to devise better plans for long-term rice crop management of in the country.