ANALYSIS OF PHENOLOGICAL TIME-SERIES MODIS DATA FOR RICE CROP MAPPING IN THE MEKONG DELTA, VIETNAM

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ABSTRACT: Rice plays a crucial role in the developing world's economy. In the Vietnamese Mekong Delta, it has long been the major economic crop to provide food for the region and is an important source of income for majority of rural populations. Thus, monitoring rice cropping activities is deemed vital for evaluating crop management practices. This study aims to develop an approach for rice crop mapping in the Mekong Delta, South Vietnam with the multi-temporal Moderate Resolution Imaging Spectroradiometer (MODIS) data during the 2009−2010 cropping seasons. The data were processed through three main steps: (1) constructing smooth time-series enhanced vegetation index (EVI) data using the empirical mode decomposition (EMD) method, (2) mapping rice cropping patterns based on the analysis of rice crop phenology and field survey data, and (3) error analysis using the ground reference data prepared after the field surveys in 2010. The comparison between the classification map and the ground reference data indicated satisfactory results. These results were reaffirmed by comparisons between the MODIS-derived rice area and the rice area statistics at the provincial level. The results achieved from the methods used in this study confirmed their validity for rice crop mapping in the study area. Such quantitative information on rice cropping activities could be useful for agricultural planners to seasonally evaluate their crop management practices in regarding to how to formulate a better long-term management strategy. The methods are thus proposed for monitoring the farming activities in the Mekong Delta and other regions in the world.