Introduction

- Rice is the most important crop in the Mekong delta
- Linking dynamic crop growth simulation models to spatio-temporal RS information provides a possibility to extend the use of an advanced research and advisory tool, originally developed for point-specific analyses, to improve crop management through farming activities at large scale, hence to lower farming investment and minimize crop production failure risks.

Landscape heterogeneity and rice cropping patterns

- Estimation of the best number of LULC classes. The red line depicts the average divergence separability values obtained per class run. The blue line represents the associated minimum divergence separability values.
- (a) the landscape heterogeneity map derived from the map series of 10–77 classes (high strength boundaries (dark brown to black); homogeneous (white) to heterogeneous areas (yellowish-brown), and low strength boundaries (light brown bands)).
- Input: 10-year NDVI profiles
- Method: ISODATA clustering with separability indices (divergence statistics)
- Finding: The 10-year sequence of decadal SPOT NDVI images supported an effective identification of complex agricultural cropping patterns of irrigated rice (overall accuracy of 94%)

Assimilation of MODIS-derived LAI to ORYZA 2000

- Look-up table inversion of the SLC model explained 69% of the variance of in situ LAI for a complete rice cropping season (RMSE = 0.9). Further improvement of SLC LAI by using equation 1 ($R^2 = 0.83$, RMSE = 0.7).
- Forcing SLC estimated LAI allowed to re-initialize ORYZA2000 state variables and recalibrate rice crop parameters, which helped ORYZA2000 explaining for about 81% variation of rice yield across the Mekong delta.