



Tropentag, September 18-20, 2019, Kassel

“Filling gaps and removing traps
for sustainable resource management”

Water Availability and its Impact on Cropping Intensity Patterns of Rice-Based Systems in Southeast Asia

CHRISTIN HECKEL, CARLOS ANGULO

University of Bonn, Inst. Crop Sci. and Res. Conserv. (INRES) - Plant Nutrition, Germany

Abstract

In the frame of the BMBF funded RICH-3P project coordinated by the University of Bonn, agricultural changes in cultivation patterns of rice-based systems in Southeast Asia have been investigated. Six (representative) sites were considered: in Cambodia Takeo and Svay Rieng, in Myanmar Meiktila and Mawgyun and in the Philippines Pangasinan and Muñoz. Among other changes, a shift from single rice (wet season) towards double rice cropping (wet and dry season) per year was found at five out of six sites. For instance, in the Central Dry Zone in Meiktila-Myanmar 108 farmers (out of 160 interviewed) indicated to produce rice twice a year in the present (2018) whereas in the past (baseline 2000) none of them practiced double rice cultivation. This development was made possible through increasing water availability (amount and timing) in the respective regions. The present study (work in progress) aims to evaluate the external pressures and the (farming system) internal drivers leading to the sustained change of single to double rice cropping. On the one hand we consider factors such as improving or installing irrigation public infrastructure, cooperative work on communal irrigation systems, extension campaigns and aid in the implementation of swallow dwells of pumps, etc., which might explain the increase of water availability for the farmers. On the other hand we investigate the thresholds of water amount and availability leading the farmers to definitely implement a second rice crop. For these purposes, apart from the evaluation of secondary sources, our work focuses on the acquisition and evaluation of optical satellite data from 1990 onwards (Landsat, Sentinel-2) with the support of radar data (Sentinel-1) in the corresponding study areas. A field-wise evaluation (polygon- and pixel-wise) of spatial and temporal water cover patterns during the land preparation and pre-flowering stages in the study areas will serve as proxy for the assessment of water availability and the determination of thresholds that have induced (or are inducing) farmers to move from single to double rice cropping in the region.

Keywords: Agricultural change, irrigation, remote sensing, rice