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Tracking the dynamics of paddy rice cultivation practice through MODIS time series and PhenoRice algorithm.

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Monitoring paddy rice cultivation is essential for ensuring food security and for land resource management in agrarian countries of South Asia. In this presentation, we investigate the spatial and temporal variation of rice cultivated area and phenological metrics in Nepal between 2003 and 2018 using the time series MODIS data and PhenoRice algorithm (Luintel et al., 2021). Comparisons of PhenoRice outputs with ancillary data show that implementation of PhenoRice with the MODIS data can be used for long-term change analysis of rice cultivation. Results on spatial distribution illustrate that rice cultivation is concentrated in the low elevation belt in the south of Nepal. The phenological mapping shows that the cultivation begins earlier in the western region compared to the eastern region and begins earlier in the hilly region compared to the plains. The inter-annual trend analysis found a statistically significant decrease of rice cultivated area at the rate of 19130 hectares per year after 2008, and the loss of rice fields was more prominent in the eastern plains while rice farming expanded in the mid-hills in the western region. Our study provides insights regarding timely and cost-efficient monitoring of rice farming at a large scale in a mountainous region.

Luintel, N, Ma, W., Ma, Y, Wang, B. Xu, J., Dawadi, B., Mishra, B. (2021). Tracking the dynamics of paddy rice cultivation practice through MODIS time series and PhenoRice algorithm. Agricultural and Forest Meteorology, 307, 108538. https://doi.org/10.1016/j.agrformet.2021.108538