Spatial Analysis on Distribution of Yield and Management Practices of Rice in Selected Area of Central Myanmar

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Introduction

The important contribution of rice to global food security requires an understanding of yield gaps in rice-based farming systems. Spatial analysis approach is to explore the maximum attainable yield, yield gap, and efficiencies of rice production. As population density increases, food safety awareness and public concern for the environment**,** yield mapping is important technique in agricultural system. The vast amount of spatial data collected could be used to make decisions on agricultural inputs, such as fertilizer, pesticides and seeds at localized site using GIS software package.

Objectives

- To provide mapping for spatial distribution of yield and management practices using spatial analysis and
- To quantifying the potential rice production of the study area and identifying the determining factors that are causes rice yield

Methodology

One of the central part of Myanmar which located between Bago mountain range and Shan Plateau, Kyee Inn area (19°42'30"-19°43'40" N and 96°13'30"-19°15'30"E) in Pyinmana township was used as targeted area. The information concern for crops, yield and management practices were collected by questionnaires interviewing with forty-eight farmers. Digital base map of the study area by taken by drone at an altitude of 120 meters above the ground level and digitizing with Pix4D software. Spatial distribution of yield and related characters were analysed with ArcGIS 10.07.

Results and Discussion

All of the sample farmers in Kyee Inn area possessed rice production area 0.5 to 35 acres. The majority of farmers were usually cultivated their seed and the rest were used from the department of agriculture. More than 95% of cultivated methods were used by direct broadcasting and very rare to used transplanting. The majority of farmers applied chemical fertilizer at vegetative stage and rarely used basal application. Because of the high cost of fertilizer, they could not apply basal fertilizer during land preparation. Only weedicide was used about 2-3 times at the vegetative stage. Insecticide for hopper and thrips were used. Results show that the actual grain yield in this region was range from 3.6 to 4.9 t/ha in 2018 and 4.0 to 4.7 t/ha 2019. Most of the farmers didn't use good agricultural practices (Fig. 1). Yield gap difference showed 0.5 to 3.6 t/ha in 2018 and 0.6 to 2.8 t/ha in 2019 (Fig. 2). The actual grain yield in some regions is already approximating maximum possible yields. Differences in yield production efficiencies are significantly correlated with management practices, irrigation, agricultural labour and global climate change.

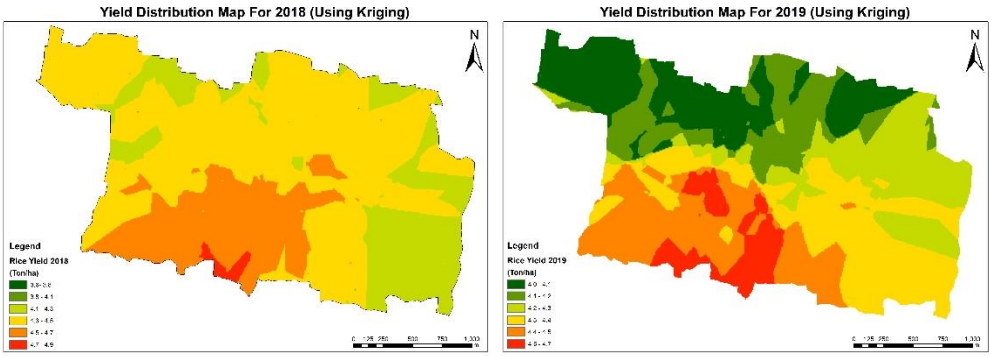
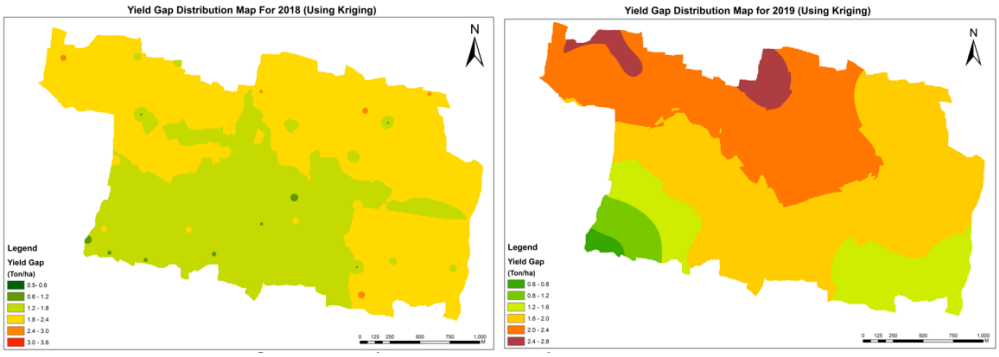


Fig. 1 Yield Distribution Map for 2018 and 2019



Conclusions

To date, spatial data have played a relatively small role in understanding the magnitude and causes of yield gaps in Myanmar. Improved knowledge of yield gaps will play a critical role in future of farmers' food safety and livelihood.

Acknowledgement

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