

Highlight of the “EJA paper of the month” (January 2012)

“Rice yields and yield gaps in Southeast Asia: Past trends and future outlook”

by A.G. Laborte, C.A.J.M. de Bie, E.M.A. Smaling, P.F. Moya, A.A. Boling, M.K. van Ittersum / *Europ. J. Agronomy* 36 (2012) 9–20

Rice production must increase to meet future food requirements amid strong competition for limited resources. One approach to bridge the gap between projected demand and current supply is narrowing the existing and often substantial yield gap in farmers’ fields. Yield gap analysis is a useful method to examine how large the ranges are between potential, desirable rice yields and those actually realized in farmers’ fields. Because average crop yields are critical drivers of food prices, cropland expansion, and food security, yield gaps should be better understood and quantified spatially. Underlying causes of yield gaps and available management adjustments must be identified.

The research carried out by Laborte et al., 2012 (*EJA* 36 (2012) 9–20) analyzed farmers’ yields and quantified yield gaps in four intensively cropped rice areas in Southeast Asia: Central Luzon (Philippines), West Java (Indonesia), Suphan Buri (Thailand), and Can Tho (Vietnam). Prospects for reducing yield gaps in farmers’ fields and the implications for national food self-sufficiency were discussed.

Yield gaps at the study sites ranged from 2.0 to 5.0 t ha⁻¹ between average and climatic potential yields, and from 1.2 to 2.6 t ha⁻¹ between average and best farmers’ yields. On average, yields varied between 43% and 75% of the climatic yield potential for all farmers, and 61% and 83% for the farmers with the best yields. The yield gaps between average and best farmers’ yields were higher in rice-importing countries (Indonesia and Philippines) than in rice-exporting countries (Thailand and Vietnam). Farmers with the best yields were generally more educated and used fertilizers and labour more efficiently than average farmers.

If the national yield gaps are similar to those at the study sites, and based on estimates of national rice requirements and assuming that self-sufficiency is a goal and consumption patterns remain the same, closing the existing yield gap between average and best-yielding farmers can sufficiently cover the yield increase needed for 2050 in all countries, except for the Philippines. There, the average yield must be raised even higher than that of the best-yielding farmers. Trend analysis of yield increases from 1966 to 2008 of a population of farmers in Central Luzon (Philippines) was carried out by fitting an S-shaped learning curve as a logarithmic technology trend. The model predicts yields to increase from 2007/2008 to 2050 by only 18% with current cultivars, production technologies, and prevailing conditions. Therefore, structural changes are needed to boost farmers’ yields to close the yield gap faster. This will require substantial investments in additional field-based yield-gap studies and efforts regarding technology transfer.

More information

<http://www.sciencedirect.com/science/article/pii/S1161030111000979>

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