Abstract

Sustainable Intensification in the Eastern Gangetic Plains: Key to Food Security and Livelihood Improvement of Smallholders [†]

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Abstract: The Eastern Gangetic Plains (EGPs) has the potential to become a major contributor to South Asian regional food security, despite the world's highest concentration of rural poverty and a strong dependence on agriculture. A regional project entitled 'Sustainable and Resilient Farming Systems Intensification (SRFSI), managed by CIMMYT with over 20 partners with ACIAR/DFAT funding was launched in May 2014 to sustainably reduce the poverty. A total of 436 farmer-participatory on-farm trials comparing the performance of three conservation agriculture based sustainable intensification (CASI) technologies like Zero/Strip till as base (ZT/ST) over the conventional tillage (CT; T1) practices were conducted across eight districts in northwest Bangladesh, Bihar and West Bengal in India, and eastern Terai of Nepal for two consecutive years i.e. 2015/16 and 2016/17. The three CASI treatments comprised a "partial CASI" option (T2: at least one crop in the cropping system established with ZT management) and two "full CASI" options (T3 and T4: all crops established with ZT/ST management; in T3 rice was direct seeded (DSR) while in T4, it was unpuddled transplanted (UPTR)). Multicriteria assessment showed an increase in rice equivalent system yield (RESY) by 4%, gross margin by 19–20%, input water productivity by 7–9% and energy productivity by 13–14% while decrease in requirements for irrigation water, energy, labor and the production cost by 15–17%, 10–11%, 32–38% and 15–18% respectively, and reduction in CO₂ equivalent emission by 8–13% in full CASI over CT. CASI has shown great promise for food security and livelihood improvement at small scale.

Keywords: sustainability; intensification; conservation agriculture; cropping systems; emission; food security; livelihoods

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