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Perceptions and Potential of Resource Conserving Technologies in the Crop-Livestock Systems of the Indo-Gangetic Plains

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Abstract

The impressive agricultural growth rates of previous decades in the intensive irrigated rice-wheat-livestock systems of the Indo-Gangetic plains in South Asia have declined considerably over the past years. This contributes to the difficulties facing rural poor attempting to participate in the general economic upswing currently evident in most countries of the region.

The Rice-Wheat Consortium, an eco-regional collaboration between CGIAR centres and national research institutions, has identified intensive tillage practices and prevailing crop residue management as causes for widespread soil degradation, a fundamental cause of stagnating crop yields. Reduced or zero-tillage systems in combination with the retention of crop residues as mulch are recommended as efficient measures for maintaining and improving soil fertility. However, crop residues, in particular rice and wheat straw, are an important feed resource within the mixed farming systems predominant in the region, livestock being especially important for poor households.

The current research project aims at quantifying drivers and constraints associated with the use of zero-till seeders and improved crop residue management at nine study sites from the Indian Punjab to Bangladesh. Household effects of introducing the recommended technologies will be estimated by household models taking into account the considerable interactions between crops and livestock.

At this stage of the ongoing study, the adoption and perceptions of various technologies with an impact on soil fertility and crop residue management (e.g. irrigation, tractor tillage, combine harvester, zero-tillage) are analysed on a village level for the selected study sites. The wide variation between sites in regard to important characteristics, such as climate, resource endowments, cropping patterns, livestock feeding regimes, price structures and market integration, enables a detailed investigation into the impact of these characteristics on current technology adoption. On this basis the potential of increased adoption of resource conserving technologies in the less developed eastern region and of intensifying integrated livestock production is assessed. For poor households with limited land resources the latter strategy could be especially promising.

Keywords: Bangladesh, crop residue management, crop-livestock interactions, India, resource conserving technologies