

# Outcomes and Poverty Reduction from Alternative Tillage Practices for Rice-Wheat Farming in South Asia



**CIMMYT**

International Maize and Wheat Improvement Center

Sustainable Maize and Wheat Systems for the Poor



The Rice-Wheat Consortium for the Indo-Gangetic Plains

An alliance of the national agricultural research systems of Bangladesh, India, Nepal, and Pakistan and international centers/institutes that fosters sustainable productivity in rice-wheat farming systems. An ecoregional initiative of the CGIAR, with CIMMYT as the convening center.



Department for International Development, U.K.

## Focus

Rice-wheat rotations provide food and livelihoods for hundreds of millions of rural and urban poor, including the landless, across some 12 million hectares in four countries of South Asia. Over 0.5 billion people live in poverty South Asia, more than in any other region.

With funding from DFID under the RWC, South Asian and CIMMYT scientists have developed, tested, and promoted various practices that reduce tillage and allow more timely sowing of wheat after rice (sowing late significantly reduces harvests). In several cases, farmers helped set the agenda, conduct experiments, and devise innovations. The resulting practices save labor, raise productivity, and open space for other crops and activities—significant contributions to the well-being of subsistence farm families. The added output also lowers grain prices for urban and rural consumers.



## Surface Seeding of Wheat

Wheat seed is tossed directly onto the soil amid rice plants prior to harvest. The method is designed especially for farmers who lack machinery and where soils are heavy and waterlogged.

There has been testing and moderate adoption in Nepal, eastern India, Bangladesh.

## Poverty alleviation

At sites in Nepal, surface seeding made the difference between yields of 4 tons per hectare of wheat and nothing at all, because farmers could plant on heavily saturated soils.

*"In fields with too much moisture that otherwise would have gone to waste, I tried broadcasting seed, and it worked very well."*

Ram Bali Prasad Yadav  
Farmer, Manigram, Nepal



## The Chinese Hand Tractor

- ◆ The two-wheel tractor, produced and used widely in China, is being adapted for South Asia with implements including pumps, threshers, reapers, winnowing fans, and trailers.
- ◆ One set of implements tills and sows in a single pass, increasing yields and saving resources.
- ◆ In Bangladesh agriculture is 80% mechanized—up from virtually 0% in 1991. Two-wheel tractors are widespread, and timely sowing has contributed to recent bumper crops of wheat.
- ◆ Tractor systems are being farmer tested in Nepal, with great success. RWC staff are working with farmers to form purchase groups, with local artisans to promote domestic production and repair of the tractors and implements, and with the government to facilitate credit and imports.

## Poverty alleviation

Tractor reduces labor, allows timely sowing of wheat.

- ◆ Timely sowing boosts harvests, makes more efficient use of fertilizer and other costly inputs.
- ◆ Reduced labor saves money, frees farmers for pursuit of other profitable enterprises, allows children to attend school.

*"When we used the big tractor, our yields were about 50 kilos. With the hand tractor our yields have almost doubled."*

Nimilan Shah, Farmer, Birganj, Nepal

*"We have saved so much time with the tractor that we can do other income-generating work and, with the money earned, we have been building some additions to our homes."*

Hari Ram Giri, Farmer, Dekawar, Nepal



## The Zero-Till Drill

The zero-till seed drill reduces tillage to *only* 1 pass (the normal practice: 8-11 passes).

**In Pakistan:** Used on more than 1,200 hectares at 304 sites.

**In India:** Used on more than 1,000 hectares in Haryana, where yields improved and production costs fell by US\$ 60/ha; a modified version is being used in Punjab.

## Poverty alleviation

More timely sowing raises yields and lowers farmers' costs by saving soil, fuel, tractor costs, water, and fertilizer.

*"Good news is that we will be able to achieve our target of 10,000 acres for zero tillage. According to our preliminary estimates farmers have bought about 50 drills in Haryana. People in some areas are so enthusiastic that they have started sowing very late in the evenings if they catch hold of a drill. Our five scientists are already in field and we discuss progress on the telephone every night."*

R.K. Malik  
Professor, Weed Science,  
HAU, Hisar, Haryana, India  
Report, 09 Nov 1999

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