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Pilot project on commercialisation of smallholder Conservatio Agriculture-based planters in Bangladesh

Overview

Widespread use of two-wheel tractors and the recent development of small farm machinery provides a platform for implementing farm mechanization, and the practice of conservation agriculture (CA) in Bangladesh. Planting crops with the Versatile Multi-crop Planter (VMP) (developed in LWR/2010/080) could optimize resource use (such as irrigation water, labour, fuel, seed and fertilizers) and increase the profit from crop cultivation. The VMP was designed for seed and fertilizer application in lines when driven by two-wheel tractors for both minimum soil disturbance strip planting and conventional tillage.

Crop establishment cost by VMP was decreased by up to 75% for strip planting compared to conventional tillage. The VMP was capable of sowing most of the crop species and placing basal fertilisers near seed rows in a single-pass operation. Despite the promising planter performance, the adoption of planters for two-wheel tractors in Bangladesh is still slow. To accelerate commercialisation of the VMP, the partnership of Hoque Corporation (manufacturing company), National Bank Ltd., Conservation Agriculture Service Providers' Association (farmers' group), Bangladesh Agricultural University, and Murdoch University will:

- identify bottlenecks and opportunities for CA-based planter adoption;
- pilot commercialisation models for sales of VMP; and
- begin research and development on four-wheel tractor-based VMP.

ACIAR project number	TBC
Start date and duration (years)	June 2018 (18 months)
Location	Bangladesh
Budget	AU $250,000

Project leader(s) and Commissioned Organisation

Professor Richard Bell, Murdoch University

Partner country project leaders and their institutions

Dr Md. Enamul Haque, PIO/Liaison Office, Murdoch University

Md. Mizanul Hoque, Hoque Corporation (HC)

Dr Abdul Hamid, Bangladesh Agricultural University (BAU)

Md. Ali Haider Mortuza, National Bank Ltd. (NBL)

Md. Liakot Ali Khan, Conservation Agriculture Service Providers Association (CASPA)

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Research

The pilot project is designed at this critical juncture to advance the CA-based mechanisation program for smallholders in Bangladesh by:

» Identifying gaps in policy and capacity, and roadblocks for the adoption of CA-based farm mechanization on small farms.

» Evaluating commercialization models for scaling up the purchase and use of smallholders' 2WT-operated CA-based farm machinery (e.g. VMP) in Bangladesh.

Assessing the opportunities and scope for four-wheel tractor planters on small farms in Bangladesh; and initiating research on and testing of appropriate four-wheel tractor-based CA (strip) planters in Bangladesh.

Anticipated outcomes

The pilot project will test commercialisation models for scaling out the VMP by targeting incentives for a private company (e.g. Hoque Corporation) that has the commitment and capability to promote the CA-based mechanization program in Bangladesh. In parallel, it will identify the policies and supply chain barriers for small-scale farm machinery adoption. The scale out approaches include: support demand creation and awareness raising to promote VMP sales in the target areas; strengthen linkages among CA and mechanisation stakeholders; and involve financial institutions to provide soft loans to approved VMP purchasers.

The Project will also assess the relative impact of two VMP commercialization models [1). Planting incentive model, and 2) Three-parties investment model] on sales of VMPs and monitor those models for their effectiveness in providing profitable planting services by service providers, and promoting further sales.

Events will be organized (involving 200 male and female operators and owners of the VMP) for training in VMP operation, repair and maintenance. Aggregation of orders and the delivery of VMP and spares is planned through dealer points and CASPA farmers' groups. To ensure optimal performance of VMP quality control and service after sale will be provided by Hoque Corporation.

Recent studies reported increasing numbers of small four-wheel tractors (35-55 hp) being used for primary tillage in Bangladesh. A desktop study will be carried out to determine the feasibility and scope for four- wheel tractor-based planter adoption in Bangladesh and assuming a positive assessment, a prototype four-wheel tractor-based VMP will be developed and evaluated under this project.

Impact pathway

The impact of VMP sales under LWR/2010/080 project was assessed in a study of 18 VMP owner local service providers and 135 farmers in Thakurgaon, Rajshahi, and Rajbari. The study revealed that local service providers effectively utilising a VMP with two-wheel tractors for 4-6 months could earn AUD 2,180 per year per set. The local service providers experienced a considerable increase in their land holdings (8%), value of livestock (11%), annual income (35%), dwelling houses (37%), household furniture (19%), and modern amenities (46%). The increased incomes were mostly spent on nutritious food, land mortgages, and dwelling house construction. The availability of VMP had significant positive influence on the adoption of CA technologies in farmers' fields. The use of VMP saved up to 34% human labour use, 31% seed, 6% fertilizer, 32% pesticides and up to 10% of the total cost of production in cultivating lentil, mustard, maize, and wheat. Furthermore, it increased crop yield and net profit by up to 28% and 460%, respectively.