

NEWSLETTER

October – December 2015, Vol. 1



Murdoch
UNIVERSITY

Conservation Agriculture Project

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Overview:

The conservation agriculture (CA) project has been active in Bangladesh since 1st April, 2012 in Rajshahi, Rajbari, Thakurgaon, and Mymensingh with the funding support of the Australian Centre for International Agricultural Research (ACIAR). The project is a collaboration among – Bangladesh Agricultural University; Bangladesh Agricultural Rice Research Institute; Bangladesh Agricultural Research Institute; Bangladesh Agricultural Research Council; and Murdoch University.



The aim of the project is to develop and accelerate the adoption of CA for selected soils, crops and cropping systems in Bangladesh, especially in rainfed areas and those with supplementary irrigation, so that farmers and households can benefit from cost-saving crop production technologies and sustainable resource management. The objectives are to- (i) Improve adoption of CA led by a service provider network; (ii) Design minimum soil disturbance planters for improved operation and effectiveness; (iii) Redesign best-practice crop agronomy to optimize it for different types of minimum soil disturbance operations, targeted crop rotations and key soils; (iv) Quantify the benefits of CA for soil fertility; (v) Develop capacity for on-going research and development of CA in Bangladesh. We have decided to publish regular newsletters. In Vol. 1 we report major achievements of last quarter of 2015 (October to December).

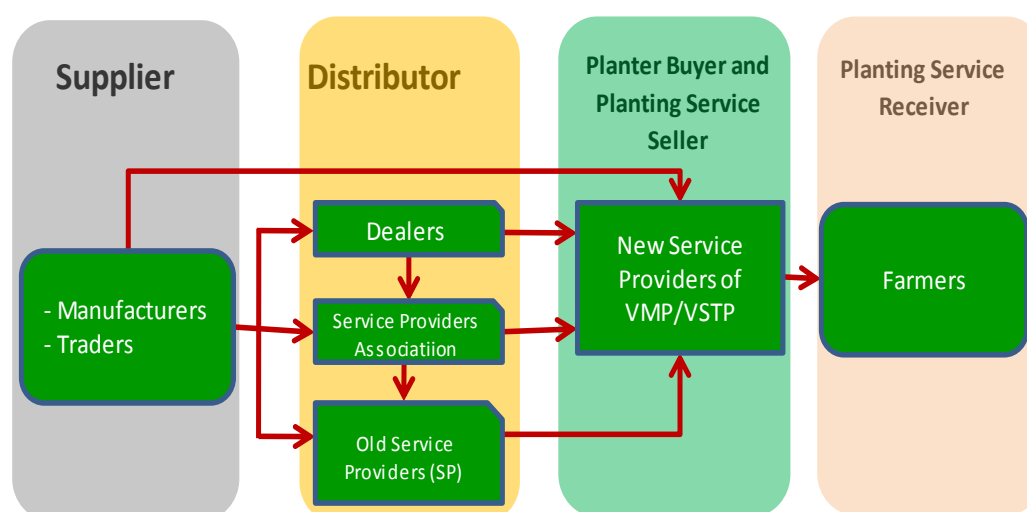
Key Highlights:

- Established supply chain (Manufacturer – Marketing Company – Local Service Providers) and facilitated sales of 21 Versatile Multi-crop Planters (VMPs) in Rajshahi (13 units); Thakurgaon (3 units); Rajbari (1 unit); Mymensingh (2 units); Tangail (1 unit); and Borguna (1 unit).
- About 500 farmers have used 16 VMPs to established 900 bigha of wheat, maize, lentil, mustard, chickpea, etc. during the rabi season of 2015.
- 102 participants attended a 3-day training event at the Bangladesh Agricultural University, Mymensingh on VMP operation, repair, and maintenance; and save use of herbicide.
- VMP Performance Review Meeting held in Rajshahi on 24 December, 2015. A total of 54 participants of different stakeholders including VMP manufacturers; commercial partners; local repair workshop; local service providers of VMP; BARI RARS Rajshahi; and project personnel attended in this meeting.
- 52 LSP attended a follow-up training program in Rajshahi on maize, jute, and mungbean sowing by VMP machine under strip planting.
- The LSP and CA Farmers information exchange visit for knowledge sharing was held in December 2015 in Rajshahi.
- Developed Tools for Raising Ground Clearance of 2WT to Maximize in-field Uses and Intercultural Operations.
- CA Network Planning meeting held in Rajshahi on 25 December, 2015.
- CA Policy Development Meeting was held at PIO/Liaison Office of Murdoch University on 7 December, 2015.
- PhD Fellows' Progress Meeting 6-7 December, 2015.

Established VMP Supply Chain

Agricultural machinery manufacturers, dealers, and service providers are the essential players in the supply chain for farm machinery commercialization. Awareness about the benefits of minimum soil disturbance planting and planter uses are the key elements for popularizing the planters which ultimately will lead to enduring demand for planting machinery at farmers' or

Commercialization Model of VMP



end users' level. To create minimum soil disturbing planter demand, initial project support is necessary through demonstration of the minimum disturbance planting and planters which builds confidence among farmers and service providers on the efficacy and reliability of mechanized conservation agriculture for crop production. Similarly, the manufacturers and dealers are not fully aware of the new CA technology and future demand for the new planters. Demand for planters and CA has been created in project areas through on-farm demonstrations, field days and farmer focus group discussions (FFGD). The project has signed a MOA with Hoque Corporation (HC) to establish the VMP supply chain. Hoque Corporation involved Alam Engineering Workshop to manufacture 21 units of VMP. HC also: supervised the quality checking of the manufactured VMP; identified new LSP; delivered and distributed the VMP; collected money from LSP who purchased a VMP.

Training on VMP Operation, Repair, Maintenance and Safe-use of Herbicide

The training program was organized at the Bangladesh Agricultural University, Mymensingh during 19 to 21 October, 2015. A total of 102 participants including Local Service Providers (LSP) of VMP, DAE, CCDB, HC, WRC-Rajshahi, BAU, KGF Project, etc. attended in this hands-on-training program.



Refresher Training and LSP - Farmers' Exchange Visit

LSP requested a refresher training on VMP for establishing maize, jute, and mungbean. Another training event was organized on 25 December, 2015 at Rajshahi and a total of 52 participants from LSP, HC, local workshop, and WRC attended this event. Subsequently, a LSP –



farmers' exchange visit was organized in Godagari Upazila of Rajshahi where all LSPs interacted with the local farmers who used VMPs for various crops.

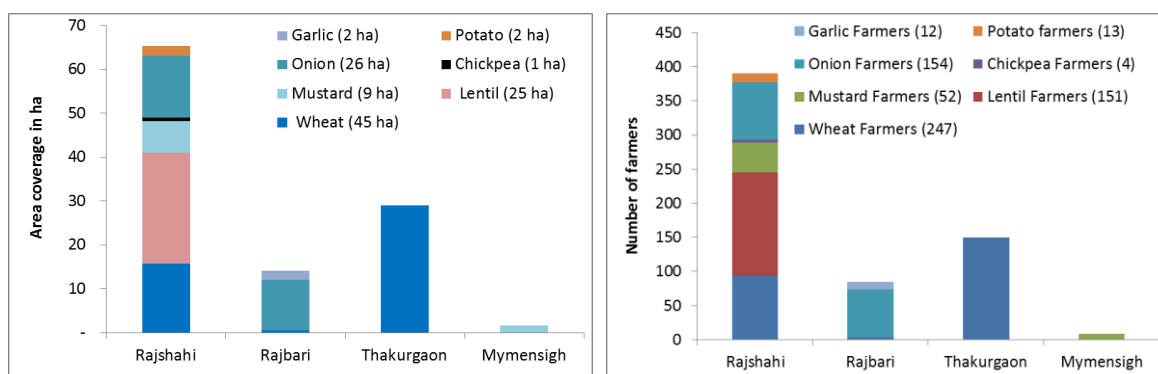
CA Network Planning Meeting

To accelerate the development and adoption of CA in Bangladesh, a network of farmers, local service providers, extension officers, NGOs and machinery manufacturers is planned in the project working sites. The purpose of this network will be to identify constraints to adoption of CA in the machinery and related-services value chain, and advocate for research and development on relevant minimum soil disturbance machinery, crop agronomy and soils involving specific cropping systems. This network could also serve as a vehicle

for dissemination of findings to farmers. The first CA Network Planning meeting was held in Rajshahi on 24 December, 2015. An initial working group was formulated with 12 LSPs from different locations.

VMP Performance Review Meeting

VMP performance review meeting was held in Rajshahi on 24 December, 2015. A total of 52 participants from different stakeholders including VMP manufacturers; commercial partners; local repair workshop; local service providers of VMP; BARI RARS Rajshahi; and project personnel attended this



meeting. During the Rabi season of 2015, a total of 21 VMPs were sold. Many LSPs were unable to use VMPs for full potential due to late delivery. However, 8 LSPs were able to cover on average 10.3 ha each (ranging from 6.93-14.1 ha); the other 8 LSPs served on average 3.6 ha of different crops including wheat, lentil, mustard, chickpea, etc.

Project Progress Review Meeting:

The project progress review meeting was held at PIO/Liaison Office of Murdoch University on 7th December, 2015 where all PIs from BAU, HC, PhD Fellows, and Project Leader (Prof. R.W. Bell) and Project Coordinator (Dr. ME Haque) attended. All PhD Fellows outlined their progress in field research, data collection and analysis, and thesis writing. All PhD Fellows are on track to submit in 2016.

Video Shooting of VMP Setting, Repair, Operation, and Maintenance:

Other than Bangladeshi use, VMP has been exported to 8 countries. To train the new LSP, it is essential to demonstrate the VMP setting, repair, operation,

and maintenance process. As such, a live video is being planned and a script developed for the video. The video shooting was done in Rajshahi on 21-23 December, 2015 and video editing is going on.

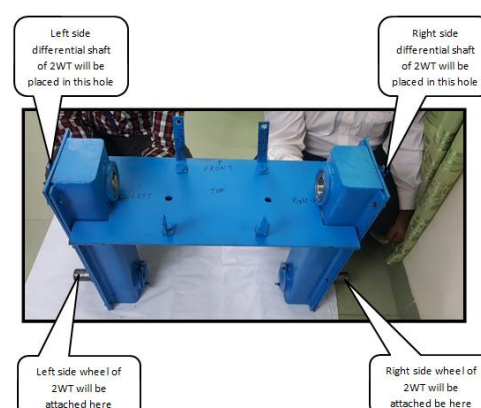
Developed Tools for Raising Ground Clearance of 2WT to Maximize In-field Uses and Intercultural Operations

Low base clearance of 2WTs restricts their use especially for inter-cultural operation in crop fields especially when the height of the crops is more than 25 cm and row spacing of the crops is narrow (<300 mm). With the existing base clearance height (182 mm) and width of the wheels, the 2WT cannot be used effectively for in-crop cultural operations (e.g., banding and



Base-clearance tools (50 cm) attached with 2WT and VMP

top dressing fertilizers, mechanical weed control, relay planning, spraying herbicides, etc.). Most of the 2WT-based smallholders in Asia and Africa perform in-crop cultural operations manually. On the other hand, unavailability of labour for these operations is a serious problem for agriculture. Volatilization losses of top dressed fertilizers are quite high due to hand broadcasting. By using of farm machinery, the crop cultivation cost and drudgery could be reduced. Fertilizer use efficiency could be enhanced by banding of top dressed fertilizers. To increase the utility of 2WT for post planting and in-crop cultural operation, it is essential to raise the base clearance of 2WT for attaching various tools. The FACASI Team Leader (Dr. Frédéric Baudron, CIMMYT- Ethiopia) and Dr. Md. Enamul Haque designed tools for raising ground clearance of 2WT. Dr. Haque and his team developed and tested the tools in Bangladesh. A third generation base clearance tool for the 2WT was exported to the FACASI Project in Africa during December, 2015.



Media:

- TV Channel - Channel I broadcasted about the VMP Operation, Repair, and Maintenance Training Program on 19 October, 2015 at 4:15 p.m.
- Bangladesh Television broadcasted a program on “VMP Development and the Conservation Agriculture Project” in news at 8:00 a.m., 12:00 noon and 2:00 p.m. on 4 January, 2016. All Bangladeshi satellite TV channels relay the 2:00 p.m. program.

Publications:

Haque, M.E., Bell, R.W., Islam, M.A. and Rahman, M.A. (2016) Minimum tillage unpuddled transplanting: An alternative crop establishment strategy for rice in conservation agriculture cropping systems. *Field Crops Research*, 185. pp. 31-39.

Haque, M.E., Bell, R.W., Kassam, A. and Mia, M.N.N. (2016) Versatile strip seed drill: A 2-wheel tractor-based option for smallholders to implement conservation agriculture in Asia and Africa. *Environments*, 3, 1; doi:10.3390/environments3010001.

Haque, M.E., Bell, R.W., Mia, N.N. (2015) Minimum Tillage Unpuddled Rice Transplanting: On-farm Performance. In *Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings*, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 11.

Bell, R.W. and Haque, M.E. (2015) Minimum Tillage Unpuddled Transplanting of Rice: An Overview, In *Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings*, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 1.

Hossen, M.M., Hossain, M.M., Haque, M.E., and Bell, R.W. (2015) Mechanized Transplanting into Unpuddled Soils for Wetland Rice Establishment. In *Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings*, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 4.

- Salahin, N., Jahiruddin, M., Islam, M.R., Haque, M.E., and Bell, R.W. (2015) Minimum tillage unpuddled transplanting of rice on a loamy soil: Medium term and Cumulative Effects on Soil Properties and Crop Yield. In Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 6.
- Zahan, T., Rahman, M.M., Hashem, A., Begum, M., Bell, R.W., and Haque, M.E. (2015) Performance of Pre-and Post-emergences Herbicides in Rice (*Oryza sativa*) Established by Minimum Tillage Unpuddled Transplanting, In Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 7.
- Hossain, M.M., Begum, M., Hashem, A., Rahman, M.M., Bell, R.W., and Haque, M.E. (2015) Mulching and Weed Management Effects on Performance of Minimum Tillage Unpuddled Rice (*Oryza Sativa* L.). In Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 8.
- Kader, M.A., Jahiruddin, M., Hasan, M.S., and Bell, R.W. (2015) Effects on Minimum Tillage and Increased Residue Retention on Crop Response to Nitrogen in a Rice-based Rotation on a Subtropical Floodplain Soil: a Medium-term Field Study. In Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 9.
- Alam, K., Biswas, W., and Bell, R.W. (2015) Greenhouse Gas Implications of Novel and Conservation Rice Production Technologies in the Eastern-Gangetic Plains. In Proceedings of the Workshop on Minimum Tillage Unpuddled Transplanting of Rice Seedlings, Bangladesh Rice Research Institute, 16-17 September, 2015; Haque, M.E., Bell R.W., Eds.; Published as e-proceedings. pp. 10.
- Alam, K., Biswas, W. and Bell, R.W. (2016). Life cycle assessment of global warming mitigation potential of novel and conventional rice production technologies in the Eastern–Gangetic Plains. *Journal of Cleaner Production* 112, 3977-3987. doi:10.1016/j.jclepro.2015.09.071