TECHNOLOGY AND INNOVATION MARKETPLACE

Profiles of technologies showcased by exhibitors during the RDFS Forum

Climate-Smart Practices and Varieties for Intensive Rice-Based Systems in Bangladesh, Cambodia, and Nepal

Cost savings from diversification, mechanization, and water-labor- greenhouse gas emission reduction practices such as alternate wetting and drying (AWD) and direct-seeded rice (DSR) technologies and stress-tolerant rice varieties can help increase yield and farmer incomes.

Overview

IRRI in collaboration with selected national research organizations, has recently completed a pilot project on climate-smart agricultural practices involving technologies with intercropping of vegetables between rice seasons, and other appropriate management practices in Cambodia, Nepal, and Bangladesh. This is part of the Asian Development Bank's (ADB) technical assistance umbrella project on "Investment Assessment and Application of High-Level Technology for Food Security in Asia and Pacific (KSTA 9218)."

Link to ADB Agriculture and Natural Resources Subsectors

- Agriculture policy, institutional, and capacity development
- Agriculture production
- Agriculture research and application

Link to ADB Sectors and Themes

- Agriculture and natural resources
- Capacity development
- Climate change

Link to Sustainable Development Goals

- Goal 1: No Poverty·
- Goal 2: Zero Hunger
- Goal 12: Responsible Consumption and Production

Training-workshops on direct seeded rice (DSR) for Nepalese farmers. The project also supported the operation of the seed drill machine for dry DSR while four drum seeder machines were distributed to farmers for wet DSR. Participating farmers also received herbicides, 12 electric sprayers, and 12 weeder machines.

Summary

Agricultural productivity and profitability from farming are low because of the limited use of modern and mechanized technologies, the high cost of production, weak links to markets, and limited crop diversification, among others.

To address these huge challenges, as affected by both climatic and resource-related factors, agricultural practices need to be adjusted. To date, different water-saving technologies for crop diversification, labor-saving mechanization, and improved management practices need to be widely introduced. For instance, the high-level technologies that are gaining ground in many countries now are AWD and DSR.

These are better options to attain optimal plant density and high water productivity in water-scarce areas, while at the same time providing higher economic returns, being suited to the objectives of mechanization, and contributing to lower methane emissions.

Farmers' Field Day in Nepal. The pilot also included Farmers' Field Day events that served as great avenues to showcase the performance of the technologies and for farmers to directly interact with other farmers and extension people from other villages.

Key Findings

The pilot project was able to demonstrate the numerous benefits of agricultural technologies introduced to the farming communities, which include (i) water savings as a result of fewer irrigation applications with the use of mechanized AWD, by up to 32% in Bangladesh and 19% to 32% in Cambodia; (ii) labor cost savings as a result of using mechanical threshing and mechanized DSR, by 70% in Bangladesh, 57% to 79% in Cambodia, and 83% in Nepal; and (iii) yield increase after the adoption of mechanized DSR and using the cropping pattern introduced by the project, by 52% to 61% in Bangladesh, 26% to 50% in Cambodia, and 6 tons (t) per hectare yield potential in Nepal.

Aside from introducing these technologies, the project also distributed seed kits of modern stress-tolerant varieties in Bangladesh (6.6 t), Cambodia (3.48 t), and Nepal (9.24 t) and conducted training for farmers and extension agents in Bangladesh (474), Cambodia (402), and Nepal (189).

Keywords: mechanization, water savings, labor savings, climate-smart, alternate wetting and drying, direct-seeding

CONTACT

Arvind Kumar
Director, International Rice Research Institute (IRRI)
South Asia Regional Center (ISARC)
IRRI-India Representative
a.kumar@irri.org

Arvind Kumar has been a fellow of the National Academy of Agricultural Sciences since 2015. He brings with him over 25 years of work experience in agriculture including his current role as leader of the Breeding for Rainfed Environments Outcome Theme of IRRI. Concurrently, he serves as the director of IRRI South Asia Regional Centre (ISARC), located in Varanasi, India and as IRRI's representative for the country. He is also IRRI's lead for the Climate-Smart Practices and Varieties for Intensive Rice-Based Systems in Bangladesh, Cambodia, and Nepal funded by the Asian Development Bank (ADB).