

## SUSTAINABLE INTENSIFICATION INNOVATION LAB: APPROPRIATE SCALE MECHANIZATION CONSORTIUM

### Phase I

#### Duration

October 2015 – September 2019

#### Appropriate Scale Mechanization Consortium (ASMC)

- University of Illinois at Urbana-Champaign (UIUC)
- Michigan State University
- Kansas State University
- North Carolina A&T State University

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#### In-Country Partners

- Bangladesh Agricultural University, Mymensingh
- Royal University of Agriculture, Phnom Penh, Cambodia
- Bahir Dar University, Ethiopia
- Nazi Boni Univ., Burkina Faso

#### Additional Partners

- ADM Institute for the Prevention of Postharvest Loss
- Conservation Agricultural Service Center
- CIRAD
- Tillers International

#### Program Goal

ASMC will assess/develop/adapt/implement/promote appropriate-scale agricultural mechanization for sustainable intensification focusing on smallholder farming systems in Feed-the-Future countries associated with targeted geographical regions, and enhance the participation and experience of women in the adaptation/adoption of technologies for agricultural development.

#### Objective and Activities

The overall objective is to intensify smallholder farmers' on-farm operations through appropriate-scale mechanization to improve land and labor productivity in a sustainable manner, considering the social, economic and environmental impacts with special focus on the role of women, by conducting the following programmatic activities via **Innovation Hubs**:

- Assess challenges and opportunities, and recommend appropriate forms for agricultural mechanization,
- Identify entities and projects engaged in mechanization research in the target countries to establish collaboration,
- Implement gender-sensitive, scale-appropriate mechanization strategies in coordination with USAID mission goals and objectives of the Sustainable Intensification Innovation Lab,
- Enhance women's skills and education in using machinery, equipment, and tools, and empower women to address agricultural issues in the future,
- Measure and evaluate impact of appropriate-scale mechanization strategies on sustainable intensification.



#### Expected Impacts

The activities supported in this program are intended to introduce mechanized technologies that are technically, environmentally, and economically appropriate for use by smallholder farmers. These technologies will contribute to enhanced labor productivity and increased land productivity, thus sustainably reducing poverty among smallholders. Finally, the program intends to leave self-sustaining innovation hubs that will persist in adapting technologies and disseminating them after the end of the project.



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### Executive Summary

The Appropriate Scale Mechanization Consortium (ASMC) has facilitated appropriate-scale agricultural mechanization for sustainable intensification in four developing countries: Bangladesh, Cambodia, Ethiopia and Burkina Faso, concentrating on technologies that increase labor productivity and timeliness while enabling sustainable cropping systems, reducing drudgery especially for women and targeting value chain development with private sector involvement for scaling. The ASMC has adopted a user-centric systems approach implemented in each country via established Innovation Hubs and Field Hubs with attention paid to the whole value chain and focused on stakeholder engagement, tertiary and outreach capacity building, and a strong emphasis on enhancing the participation of women in technology adoption.

Different technologies have been explored, developed, manufactured, and promoted to the point of them being scaled up via sustainable business models through private sector-public sector engagement. In each of the countries at least four technologies have been earmarked for scaling. An example is mini-combine harvesters for rice in Bangladesh that have been shown to reduce harvest losses by 5% with a labor saving of 65%. Importation and deployment of this technology has been facilitated by engagement with private sector companies. From a policy standpoint, the Bangladesh government announced very recently that it would provide a 60% subsidy for this combine harvester to promote its use by smallholder farmers in the country. Promotion of conservation agricultural practices is a key topic in each country and technologies have been identified that elevate such practices and contribute to improved soil health. In the case of vegetable production, the introduction of hand tools that reduce the drudgery especially for women has been an important outcome. Leveraging more efficient solar-powered water lifting devices has opened up opportunities for more efficient irrigation systems impacting vegetable and forage production.

Gender engagement has been a significant focus in the project and has been addressed through various activities. These have included gender sensitization training for understanding gender roles for technology adoption conducted in each country with Innovation Hub members and stakeholders; and development, refinement and application of a gender technology assessment tool accommodating technologies at various scales of development, including prototypes.

Considerable opportunities exist for continuing the work initiated by the ASMC. These include preparing and applying a Technology Readiness Assessment of each of the technologies identified for potential scaling and transformational change; continuing efforts to engage with the private sector to facilitate the technology scaling process; pursuing a tertiary capacity building effort to create a B.S. curriculum combining technology and business; and expanding on existing gender and youth engagement efforts.