### **Scaling small-scale mechanization in the Ethiopian Highlands**

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## Introduction

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Farming operations on smallholder farms in Ethiopia are predominantly performed by human muscle power leading to high drudgery. The animal-drawn *maresha* is a symbol of agriculture in Ethiopia. However, the system is labour intensive especially at land preparation stage when the soil is tilled 3-4 times before planting. Precision in planting and fertilization, irrigation of high value crops, harvesting and post-harvest processing is low on smallholder farms. The two wheel tractor (2 WT) based technologies offer an opportunity to tackle some of these challenges faced on smallholder farms in Ethiopia.

## Key challenges and lessons

- Lack of commitment by some service providers
- Uncertainty of project funds during 2018.
- Selection of service providers target business minded people.

# Method/Approaches

- In-class and on-field training of service providers (SPs) and agri officials.
- Paired plot on-farm demonstrations as learning and data generation centres.
- Awareness/demand creation events on small mechanization.
- SP for scaling technologies, income generation and employment.
- Government and private sector engagement throughout project implementation.
- Survey assessing effectiveness of SP models.

- First assess the niche for different 2 WT technologies before investing in different equipment.
- Training is a continuous process in the use of mechanization.
- Private sector partners require big numbers to seriously invest/participate in mechanization activities.



#### **Results/Achievements**



Type of Technology	Cost without mechanization (\$ ha <sup>-1</sup> )	Cost with mechanization (\$ ha <sup>-1</sup> )	Difference (\$ ha <sup>-1</sup> )	% cost reduction as a result of hiring mechanization services by farmers
2 wheel tractor wheat planter	105.20	63.40	41.80	40
Wheat harvester	125.90	59.30	66.70	53
Wheat thresher	201.10	92.10	109.00	54
Trailer for transportation	48.90	40.90	8.00	16

Figure 1. Various field activities in relation to mechanization in the Ethiopian highlands.

## Plans for 2019

- Training: Technical and agribusiness training of SPs and equipment operators.
- Scaling: (a) Awareness creation through field days and on-farm demonstrations, (b) service provision of 2 WT technologies.
- Research: (a) Assessing the effectiveness of service provision models being used for scaling 2 WT based technologies.
- (b) Assessing profitability of different 2 WT services
- Research: On-farm trials/demos for generation of maize and wheat productivity and profitability.
- 1100 hhs had received different 2 WT mechanization services in December 2018. We trained 1 female and 24 male service providers in 2018.

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Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

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