



Multi-Crop Thresher Fabrication



Proposal Packet



Soybean Innovation Lab
Feed the Future Innovation Lab for Soybean Value Chain Research





Build it Local

Many smallholder farmers in the tropics do not have access to durable and affordable harvest equipment such as crop threshers. Imported threshers are often too costly and too large and cumbersome for small farmers, have too high of energy needs or end up in the scrap pile if repair parts cannot be located or fabricated.

Creating a **local, skilled workforce** for the fabrication of small to medium sized threshers can solve many of the problems of availability and affordability that prevent smallholder farmers from scaling up production.

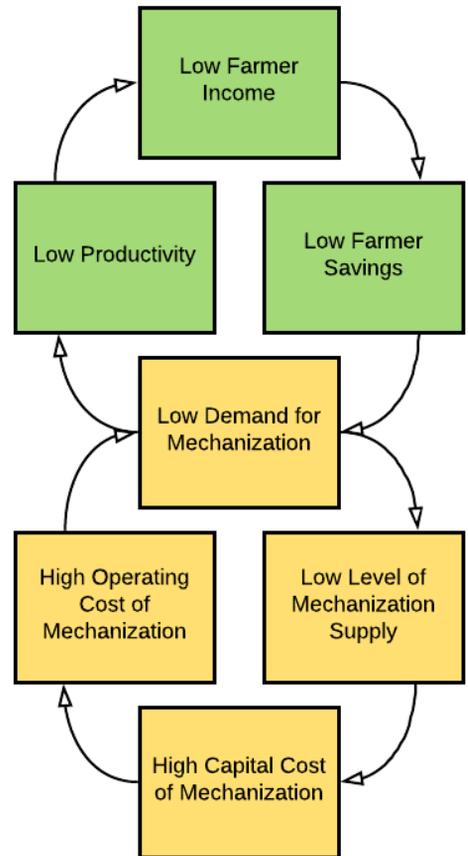
Locally-made also means locally-repaired and serviced. Local fabricators can listen to customer concerns and customize equipment to the needs of the individual or groups of end-users.



Local artisans and welders can more easily and quickly create and maintain threshers for their communities. Image credit: SIL



The SIL multi-crop thresher can easily be manufactured, maintained, and retooled to specific local needs. Image credit: SIL





The Thresher

The multi-crop thresher was designed by a Ghanaian engineer and has been extensively field-tested by both SIL and farmers. It shells maize in the husk and threshes soybean and rice with no grain loss. Interchangeable concave sieves make it usable for multiple crops. It can thresh maize, soybean, rice, sorghum, cowpea and common beans.

The machine threshes soybean 40 times faster than traditional stick beating and helps reduce drudgery and increase productivity for smallholder farmers.

The multi-crop thresher is sized and priced for purchase and use by thresher service providers for smallholder farmers or mid-sized farmers. It can be powered with a diesel engine or through a tractor power take-off.

Watch videos of the thresher prototype in action!
<https://bit.ly/2HM0Pub> and <https://bit.ly/2qX2eEx>



The thresher design features easy-to-use controls and the machine can be transported by bicycle. Image credit: SIL

Our thresher:

- Is designed for service providers
- Is 40 times faster than manual beating
- Produces near zero machine loss of grain (compared to 5-50% with commercially available multi-crop threshers)
- Produces zero dust
- Does not split seeds
- Winnows out chaff
- Requires only two people to feed and operate it efficiently
- Costs \$2,000





The Trainers and Trainees

Train the Trainer Workshops are led by SIL researcher Kerry Clark (below, left) and SIL training partner and lead engineer Gabriel Abdulai, (below, right).

The workshop is designed for local artisans, welders, machinists and others who are interested in developing and maintaining threshers for local communities. To ensure the threshers have local ownership, SIL is developing a business model to grow the capacity of local communities to manufacture, operate and maintain the technology as needed.

In addition to the thresher fabrication, attendees receive training on business development, product pricing, customer service and how to tailor the machine to local settings and community needs.

When they farm and they are harvesting they find it difficult to thresh unless they use sticks for the threshing. The threshers we are building are easier for you to carry to your farm because you can even pull it with your bicycle.

Baaba Issahaku Yakubu
Artisan in Nyankpala
Training Participant



The Train-the-Trainer workshops provide attendees with a complete understanding of how to manufacture and maintain the machines, as well as how to operate their own associated business. Image credit: SIL





Workshop Specifics

The Soybean Innovation Lab is offering customized training workshops in small thresher fabrication. Our instructors can either train your selected local blacksmiths/welders or we can train your own trainers.

SIL offers customized train-the-trainer workshops in small thresher fabrication. Workshops require 6 days.

Day 1: A knowledge pre-test is given to participants and training covers math skills and construction calculations, three-dimensional design reading, function of basic thresher components, welding methods, and safety.

Days 2-5: Our trainer teaches hands-on fabrication skills and quality control and a model thresher is constructed by participants.

Day 6: Attendees receive training on business development, product pricing and customer service, and a knowledge/skills post-test.

The complete training package for up to ten people is \$25,000.

This includes two SIL trainers, training facility charges, materials and supplies, trainee travel and per diem costs, and evaluation and reporting.

The workshop can be conducted in any area where there is a facility with power, appropriate tools, and welders.

Watch a video about the training at <https://bit.ly/2Hv0tsz>



*The workshops include training on thresher fabrication and on business development skills.
Image credit: SIL*

The machine makes threshing easier. It also does not mix with soil as compared with beating with sticks on a tarpaulin or the ground. It won't break the beans either. With threshers I don't need communal labor, my children and I can do all the threshing by ourselves.

Nakiwo Ndoiyili
Farmer in Saboba



Follow-Up Support

The SIL team actively engages in a variety of follow-up support activities after workshop completion.

These can include:

- Retooling of machinery (specifying the tools more exactly to local needs)
- Integration into a improving mechanization network
- Integration into a train-the-trainer network
- Data collection
- Monitoring and evaluation

Mechanization Network

SIL's Mechanization Network brings together farmers, mechanics, agencies, businesses, NGOs, and others to share information, ideas, designs, and business models.

The network features regular webinars including presentations from researchers, scientists, small business owners, start-up companies, and more. The network also offers participants a dedicated online forum where they can communicate and share resources.

The network also includes the Improving Mechanization for African Smallholder Farmers webinar series. The webinars address the major constraints on mechanization in Sub-Saharan Africa such as: sound business models for service delivery; local manufacturing, service, and parts supply; availability of information on appropriate and smart design; equipment affordability and credit; and gender equity when introducing mechanization.



Workshop attendees becoming skill in thresher maintenance and follow-up support for their communities. Image credit: SIL

To be included in the network, contact Kerry Clark at: clarkk@missouri.edu

To view earlier webinars, visit the SIL Events page at: soybeaninnovationlab.illinois.edu/events

The Feed the Future Innovation Lab for Soybean Value Chain Research is USAID's only comprehensive program dedicated to soybean technical knowledge and innovation. Our international team of tropical soybean experts provides direct support to researchers, private sector firms, non-governmental organizations, extensionists, agronomists, technicians and farmer associations tasked with soybean development.

Contact SIL at soybeaninnovationlab@illinois.edu

