Low Cost Sustainable Agriculture Kits (SAKs) as an Agronomic Strategy to Improve Farmer Livelihoods in Nepal

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Introduction

The world's 1.1 billion subsistence farmers do not have access to peer-reviewed knowledge of best agronomic practices, good seeds, or inexpensive farm tools. What is lacking is a means to package, deliver and share these technologies to farmers who earn \$1-\$2 per day. Like a restaurant menu, Sustainable Agriculture Kits (SAKs) are intended to be regional menus of private sector technologies and ecological practices – from which an individual farmer can purchase one or more items at a cost of \$1 (ideally) to assemble a technology kit that is appropriate for his/her own needs. The items are intended for sale at stalls in villages. A SAK consists of 3 components: (1) locally approved seeds, (2) low cost tools and technologies focused on reducing female drudgery, and (3) an agricultural extension picture book to communicate best agronomic practices (indigenous and scientific) to empower illiterate farmers. In rural Nepal, following grassroots surveying of households, we are in the process of conducting on-farm agronomic trials to test the efficacy of the identified SAK interventions. In parallel, we are scaling up SAK products and practices that have previously been validated, using participatory approaches. To enable distribution of these products, we are piggybacking onto a pre-existing snackfood distribution network as well as the franchises of a Nepalese private seed company. The picture book of best agronomic practices is open access and will be available online shortly at www.SAKNepal.org.

Objectives

- Test at least 20 best-practices and products for inclusion in the SAKs (e.g. on-farm trials with test farmers);
- Test innovative knowledge extension models for targeted communities (e.g. SAK Picture Book);
- Test the SAK scaling up model (e.g. snackfood dealers, consumer feedback cell phone survey).

Methodology

Identify farmers' needs using holistic surveys

Collaborative design of low cost (or free) and profitable solutions that are sustainable and reduce female drudgery.

Participatory on-farm testing of each solution using a split-plot design at multiple locations.

Create the toolkits that are comprised of best practices and products/tools along with the picture explanations

Scale up the best practices and products through an NGO spin off private seed company and existing ag. vendors (Agrovet/dealers, periurban snackfood distributors) to villages

Cell phone consumer survey to measure the success of the products and the efficiency of distribution networks

Large scale promotion of successful product/practices to wider communities







Toolkit Component 1: Seeds for the Cropping System



Improved and early maturing crop varieties



Planting yam in sack at the base of terrace walls



Intercrop with legumes to reduce N-requirements



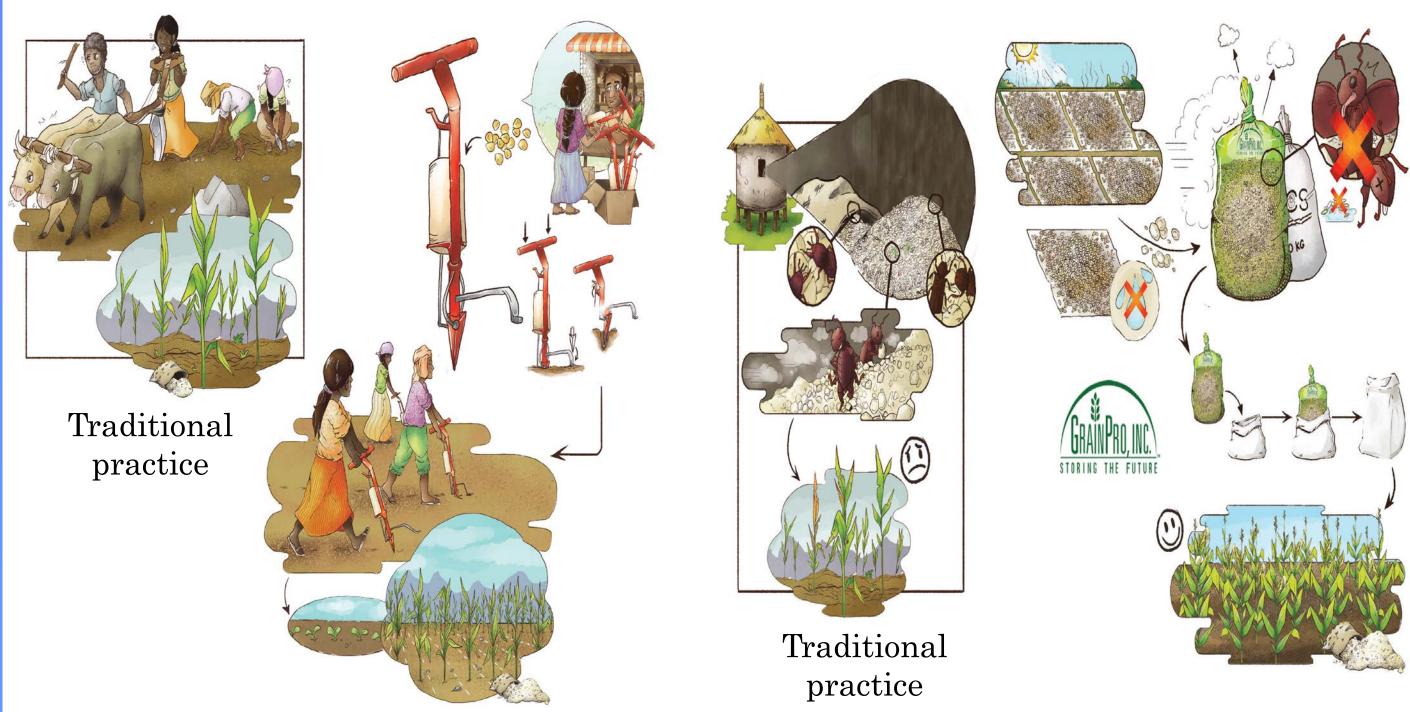
High value vegetable seeds for nutritional security

Toolkit Component 2: Low Cost (\$1-\$10) Technologies

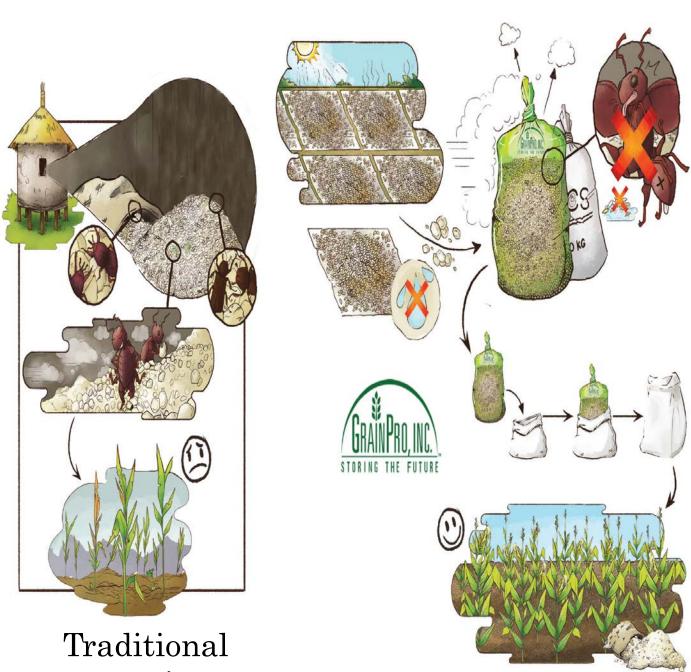
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- Wall crops in vertical slopes
- Legume seeds coated with rhizobia
- Jab planter
- Maize-ginger intercropping
- FYM improvement practices
- Hand gloves
- Low oxygen grain storage bags
- High value legumes in rotation
- Fork weeders
- Legumes on terrace edge
- Living grass barriers
- Seed cleaning

Toolkit Component 3: Picture Book of Best Practices for Illiterate Women Farmers



Lesson 1 A jab planter reduces labour (animal and human power) required to sow seeds







Ginger - soyabean intercrop to reduce pest problems

Wall crops to generate extra income and conserve soils

- Fertilizer micro-dosing Rainwater harvesting Grafting (fruit/fodder) • Cattle urine as insecticide • Dry season legume forage • Line/grid sowing tools Balanced fertilization Micronutrient fertilization • Post harvest value addition • Plastic tunnel for seedlings Electric finger-millet thresher* Mini-tillers*
 - *Community SAK products

Lesson 2: Low oxygen grain storage bags protect seeds from insect and molds

Progress

1. We conduced extensive quantitative surveys at project sites to identify needs, survey indigenous innovations and identify local entrepreneurs.





2. We have been working collaboratively with farmers to agree upon initial toolkit components



3. We are field testing toolkit components using a controlled split-plot design at multiple locations.

Intercropping Wall crops on Legumes on te Crop rotation Improved farm Rhizobium ino Trials with pla

harvesting an

4. Local vendors/ distributors have been identified and the scaling up process has begun.



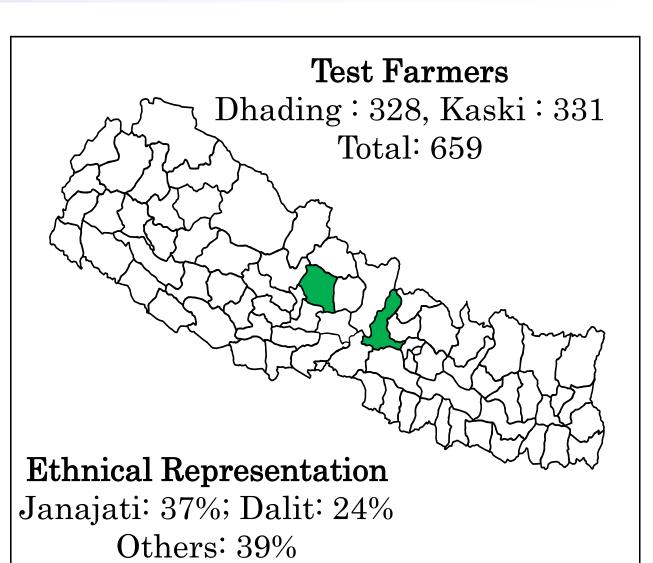
Conclusions

Acknowledgements

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SAK Nepal Trials

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Preliminary Results Increased land productivity by 20-49% Net income increased (up to \$80/plant) Provided extra benefits to farmers 8 Net economic returns increased by 25% Improved FYM quality, matured early Increased nodules, better crop growth Reduced female drudgery in agriculture by reducing time, pain and efforts

5. An open access online picture book describing $\sim 120 \text{ low cost}$ technologies is being field tested.



Subsistence hill-side farmers have been extensively surveyed to identify "low hanging fruit" bottlenecks that can be helped with simple, low cost interventions.

Candidate low cost interventions are being tested in controlled, split-plot trials to enable their incorporation into low cost commercial Sustainable Agriculture Kits (SAKs).

Local vendors/distributors have been identified in 7 districts who can transition SAKs to profit-based private businesses for scaling up of SAKs to reach 100,000 farmers in Nepal. An online, open-access, free manual describing 120 low cost technologies has been created to help farmers, entrepreneurs, and NGOs to get started with their own SAK projects.