

CONSERVATION AGRICULTURE NEWSLETTER



DECEMBER 2021 • VOLUME 7 • ISSUE 4

INSIDE THIS ISSUE

Strategies for
Improved Seed
Production

Digital and Remote
Extension Experience
from Kenya

Partner Profile:
Utooni Development
Organization

Discussions
from the
Network

Strategies for Improved Seed Production

Neil Rowe Miller, Agriculture and Livelihoods Technical Advisor for Eastern Africa

High-quality seed can increase crop yields, incomes, nutrition, and resilience of smallholder farmers. Because over 90% of the seed planted in sub-Saharan Africa is grown by farmers, not by commercial companies, the biggest gains in seed quality will come through improving local production and storage. Non-governmental organizations (NGOs) often work to improve the availability of, and access to, good quality seed by farmers. Despite large investments in seed programs, the outcomes of these interventions have been mixed.

The first step in improving seed quality and availability is to carry out an assessment of existing seed systems and their potential for improvement. Questions which should be answered by such an assessment include:

- Where do farmers currently obtain seed of the different crops they grow?
- What varieties are available and accessible to farmers?
- What is the quality of the available seed (genetic purity, germination, pest and disease status)?
- What evidence is there that “modern” varieties, available as alternatives to local seed, are actually “improved” in terms of yield or other characteristics?
- What is the potential benefit to farmers who plant seed of new varieties or of higher quality?



Self-pollinated crops, like velvet bean (*Mucuna*) can be kept by farmers genetically pure for many generations without significant outcrossing.

STRATEGIES FOR COMMUNITY SEED PRODUCTION

If you have determined that improved seed quality or new varieties have significant potential to benefit farmers, you will next need to decide what strategy has the greatest potential to deliver these benefits.

SEED PRODUCTION AT THE INDIVIDUAL HOUSEHOLD LEVEL

Virtually all small-scale farmers save some of their own seed for replanting in the following season. For some self-pollinated crops, like beans, rice and wheat, seed can be maintained for many years without significant loss of quality. For such crops, the profit potential of commercial seed production is very low, since farmers only need to purchase the improved seed once, then maintain it for subsequent years.

If the crops which have been identified as having high potential for improvement in your seed assessment are largely self-pollinated, the best strategy for improved production is to train individual farmers to produce and store their own quality seed. The quality of seed saved at the household level can be increased dramatically with training on several key subjects (*we will include such details in a follow-up article on “Methods for Improved Seed Production” in our March, 2022 newsletter*).

INDIVIDUAL SEED PRODUCERS (SERVICE PROVIDERS)

Cross-pollinated crops, like maize, sorghum and sunflower, are much more difficult to maintain on a small farm since individual fields are very difficult to isolate from neighbouring farms. Because of their high potential for such outcrossing, the genetic purity of “improved” cross-pollinated crops tends to deteriorate more quickly and their yield potential declines after a few years of saving seed. For these reasons, the benefit of buying new seed is increased for such crops, and the potential profitability for commercial seed producers is higher than with self-pollinated crops.

One sustainable strategy for local production of cross-pollinated crops is to work through local service providers. Farmers are identified who already have a high standard of production. They are further trained on appropriate isolation distances for maintaining the genetic purity of different crop species and effective seed storage methods (*we will include such details in a follow-up article on “Methods for Improved Seed Production” in our March, 2022 newsletter*). Because such farmers have much lower overhead and transportation costs than licensed seed producers, they can provide quality seed to their neighbours at a lower price and still remain profitable.

Furthermore, if such producers are connected to government seed schemes and/or private-sector seed companies, the seed they produce may be certified as [Quality Declared Seed](#), which brings higher prices and can be sold commercially in most countries. Strengthening the marketing and business skills of service providers involved in seed production is as important as agronomic training. Linkages with the private sector are also helpful as they may provide a consistent market as well as inputs and equipment which can further enhance incomes of seed producers.

COMMUNITY SEED BANKS

A common strategy for seed production and storage is to work through groups who store seed of individual farmers separately or bulk seed for collective storage. These groups may produce seed for their own use or for sale to other farmers. The biggest benefit of a community seed bank is that seed is protected from being consumed as food during times of scarcity. However, they demand a high level of management, and often collapse once project resources are discontinued due to a number of challenges:

- Financial viability – Economic sustainability should be embedded in community seed banks from the design stage, beginning with a thorough market assessment and a business plan. They must be able to cover their operational costs; including the labour of members involved in receiving, documenting, handling, and distributing seed. Schemes which rely on volunteer labor are not likely to survive long. If the business model is found to be unprofitable, the seed bank idea should be abandoned in favor of another seed production strategy based on individual household production or service providers (see above).

- Quality control - It is very difficult to control the purity of bulked seed since farmers tend to keep the best seed for themselves and give seed of lesser quality to the seed bank. An alternative to bulking is to store individual farmer's seed separately within a community storage facility. Clustering fields for seed production in one geographic area can help assure adequate isolation distances and seed purity.
- Marketing - In addition to storing farmer-produced seed, many community seed banks that have been successful also produce and sell seed to non-members to generate income for the organization. However, many seed production schemes fail to sell the seed they produce because they have a poor marketing strategy, especially if they are producing self-pollinated crops.



More details and case studies on the challenges and success of community-based seed production can be found in our Technical Note on [Sustainable Seed Systems](#) as well as in the following publications: [Community seed production](#), [Community seed banks: Concept and practice](#), [Community seed banks: Origins, evolution and prospects](#).

To reduce the quality control problem, farmer groups supported by the Evangelical Fellowship of Sierra Leone, a Tearfund Canada/Foodgrains Bank partner, store seed in a common store, but keep seed from each farmer in a separate container.

Digital and Remote Extension Experience from Kenya

Mike Salomons, Agriculture and Livelihoods Technical Advisor

When the Covid-19 pandemic hit, the National Council of Churches in Kenya (NCCCK) was implementing a three-year “Upscaling Conservation Agriculture for Improved Food Security and Sustainable Livelihoods” project reaching 4000 farming households in Tharaka Nithi County of central Kenya. As a part of this project, NCCCK worked closely with the county government in improving extension services and support for local agricultural and food security work. However, midway through the project, Covid-19 lockdown and other restrictions forced government extension officers to suspend their activities. This created more demand for NCCCK agronomists’

services, though they were also restricted to meeting with groups of 15 or less. By the summer of 2020, smallholder farmers in the county were experiencing the following impacts from Covid-19:

- Reduced access to agricultural extension services
- Market closures
- Restrictions on people's movements
- Reduced access to credit
- Loss of income and the potential for increased rates of gender-based violence

Around this same time, the Canadian Foodgrains Bank selected 17 partners that were well positioned to rapidly and efficiently respond to the significant needs that were emerging because of the COVID-19 pandemic. NCCK, with support of the Foodgrains Bank network (United Church of Canada, Tearfund Canada, and the Government of Canada) was chosen as one of these partners. The initiative they undertook included several innovative remote-training platforms to provide extension education and services to farmers.



NCCK staff train Principle Lead Farmers on use of phone-based extension services.

INTERACTIVE RADIO PROGRAMMING

Each month, NCCK recorded radio programs in the Kitharaka language on various subjects including Conservation Agriculture (CA) practices, weed management, pest and disease management, post-harvest handling and storage, poultry diseases and management, etc. Each program was aired on Getu Fm 87.6 three times during the month, and farmers could call in to give comments or ask questions to which agronomy staff responded. This generated a high amount of interest from farmers well beyond the participants in the project.

SMS MESSAGING

NCCK hired a consultant to develop a system which would send bulk SMS messages at key times of the year, covering many of the same subjects as the radio programs. These messages include a USSD code (*372*8#) that farmers could dial using smartphones or non-smartphones to get further information. NCCK pays a subscription fee so that the information was accessible to farmers at no cost. The project team update the extension messages regularly through an internet-based dashboard in order to keep them relevant.

A typical SMS message sent to farmers went as follows: "Hello farmer. Have you planted? Are you spacing your crops properly? Dial *372*8# to know how to space maize, sorghum, millet, and other crops. For more information visit, fabo.org/ncck/NCCK_CA"

ONLINE COURSES

The NCCK team developed an online CA learning site on the FABO training platform (http://fabo.org/ncck/NCCK_CA). NCCK staff and lead farmers produced video clips on CA principles and other good agronomic practices. 72 principal lead farmers (43 females, 29 male) were trained to access information on the learning site, which they could then share with other farmers. The FABO training site worked well for those who could access it, though one challenge was that only those with smart phones could access the site. NCCK is continuing to upload information and publicize this learning platform. In addition to the NCCK course, Fabo.org has a wide variety of free courses on topics related to humanitarian assistance, and agriculture and livelihoods programming.

1. WHAT IS CONSERVATION AGRICULTURE?
2. LAND PREPARATION AND PLANTING
3. INTEGRATED SOIL FERTILITY MANAGEMENT
4. SAFE USE OF CHEMICALS
5. WEEDS AND WEED CONTROL MANAGEMENT
6. COMMON PESTS AND DISEASES IN CEREALS AND PULSES
7. MATURITY INDICES FOR CROPS
8. POST HARVEST MANAGEMENT
9. MARKETING AGRICULTURAL PRODUCTS
10. BASIC AGRONOMIC PRACTICES FOR CEREAL & PULSE CROPS
11. POULTRY FARMING
12. GENDER INVOLVEMENT IN AGRICULTURE

The NCKK Conservation Agriculture course on FABO has 12 units.

WHATSAPP GROUPS

The project also formed WhatsApp groups so that lead farmers could share information, experiences and learn from each other. These WhatsApp groups also provide NCKK staff another means to keep in touch with the Lead Farmers in the project.

In the past, NCKK facilitated the purchase of bicycles at a subsidised price for Lead Farmers in their Tharaka Nithi project. Following the success of these digital/remote technologies, the Lead Farmers requested that they be assisted to buy smart phones instead of bicycles. The Covid pandemic has clearly changed the methods and technologies we use to train and keep farmers informed. Hopefully these lessons will continue to increase our impact in rural communities even beyond the pandemic.

Partner Profile: Utooni Development Organization (UDO)

John Kimathi Mbae Agriculture and Livelihoods Technical Advisor for Eastern Africa

Utooni development Organization (UDO) was founded in 2002 under the name, Excellent Development Kenya. The organization was registered as a Kenyan non-governmental organization in 2005, and in 2010 changed its

name to Utooni Development Organization. The mission of the organization is to support disadvantaged communities in the Arid and Semi-Arid Lands of Kenya by transforming their environment in a sustainable manner and by enabling farmers to improve water supplies, food production, income and health through inter-community education, peace and justice programs. UDO is a partner of Canadian Foodgrains Bank through the Mennonite Central Committee (MCC).



Demonstration of minimum tillage hand-dug furrows to new project farmers (photo: UDO).

Since its establishment, UDO has supported communities to access water resources by organizing sand dam construction with community participation and funds from donors. UDO's water projects involve environmental conservation and water harvesting through dams, water tanks and shallow wells. To date a total of 1573 sand dams and 46 shallow wells have successfully been finalized and commissioned for use by communities. In these ways, they have addressed a major constraint for smallholder farmers in southeastern Kenya communities who experience long dry seasons which lead to water insecurity.

UDO participated in the Scaling-Up Conservation Agriculture (SUCA) program from 2015 to 2021 in three counties of Eastern and Rift Valley Provinces of Kenya. The project trained 5307 smallholder farmers which gave rise to an additional 1000 spontaneous farmers adopting CA, making a total of 6307 farmers. (1602 men and 4705 women). A total of 5875 farmers adopted CA by the close of the project. The project also supported farmers in marketing of produce through aggregation/collective marketing. A total of nine aggregation groups were formed and successfully sold produce. Yields also increased dramatically under CA-Plus (see table).

Crop Yield Changes for Various Crops 2015-2021		
Crop	Baseline yield (kg/ha)	End line yield (kg/ha)
Beans	599	1447
Green grams	197	652
Cowpeas	399	1156
Maize	404	630

As a follow-up, capitalizing on experience from the SUCA project, UDO embarked on a three-year climate smart agriculture and livelihood project in September 2021. The new project will operate in Machakos and Makueni Counties and plans to work with 3000 farmers. The main project activities are promotion of CA-Plus, drought tolerant crops not available locally, biointensive kitchen gardening, food forests, poultry, goat, and bee keeping, income-generating activities like brick making, and advocacy to county governments to support policies conducive to CA-Plus and climate smart agriculture



Penina Mbindyo of Makueni County threshes a bumper harvest of cowpeas despite low rainfall during the first season of 2019, thanks to CA-Plus farming

Discussions from the Network:

John Kimathi Kirima: How effective is marigold in control of pests?

Roger Sharland: My experience is that it is effective, especially when planted as a companion in well cared for living soils, aka organic. *Tagetes* species, particularly the French Marigold *T. patula*, are often used in companion planting for vegetables as the pungent smell both repels and confuses insect pests. It also deters nematodes; and for this reason is helpful with tomato, eggplant, chili pepper and potato. Due to antibacterial thiophenes exuded by the roots, it is not recommended near any legume crop. *Tagetes* species are also helpful for repelling mosquitoes at night.

John Kimathi Kirima: Roger Sharland, thank you this is very clear.

Oliver Charles Otsimi: Lovely!

Anita Kamoni: It acts as a repellent.

Aregehegn Peter: What an Idea! thanks for sharing with us!

The CA Technical Officers manage a Facebook Discussion Group from which the above conversations were copied. If you'd like to join the discussion, sign up at www.facebook.com/groups/CAinAfrica.



Source: [Lakeshore Vermicomposting](#)