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Seed Systems in Food Security Programming

**Jean Twilingiyumukiza, Agriculture
& Livelihoods Technical Advisor,
Central/West Africa**

Production and distribution of high-quality seed can increase yields, nutrition and resilience among smallholder farmers. In fact, the Food and Agriculture Organization ([FAO, no date](#)) argues that the *food security* of a farming community is dependent on its *seed security*.

In most countries two seed systems coexist. **The formal seed sector** is run by government agencies and commercial businesses which produce certified seed of distinct and consistent registered varieties ([Louwaars & de Boef, 2012](#)). In sub Saharan Africa (SSA), the World Bank estimates only 5-10% of farmers purchase seed from the formal sector. **The informal seed sector** includes seed saved by individual farmers or sourced from neighbours or local markets. Seed from this sector is readily accessible and cheaper, but of less consistent quality ([ACBIO, 2015](#)). The informal seed sector can produce seed of registered varieties but also traditional landraces and mixtures. It provides between 80% and 90% of seed planted by farmers worldwide ([Practice Brief 6](#)).



Cover crops, like this jackbean planted under maize, have spread widely over the past 10 years, due in part to seed distribution by CFGB-supported projects.

KEY TERMS USED IN SEED SYSTEMS

- **Self-pollinated/cross-pollinated crops:** Many crop species; including beans, rice, wheat, and tomato; can produce seed without receiving pollen from another plant, and therefore reproduce “true to type” through many generations. Cross-pollinated crops, like maize and sunflower, reproduce using pollen from other plants, transported by wind or insects. Unless they are grown in isolation (either physically or by planting at a different time)

they will not breed true from generation to generation. Other crops; like melons, pumpkin, cotton and pigeon pea; reproduce through both self- and cross-pollination. These characteristics determine how much they need to be isolated to produce pure seed.

- **Open pollinated varieties (OPVs)** are varieties which produce seed that is genetically similar to the parent. If the crop is cross pollinated, the OPV will need to be isolated to produce pure seed ([FAO, 2010](#)).
- **Hybrid seed** is created by cross-pollinating different lines for seed production. Hybrids generally produce plants with greater vigour and uniformity. When grain from hybrid seed is replanted for a second generation, the offspring are not true copies of the original hybrid, so farmers must buy new seed each season. Maize is the most widely utilized hybrid seed.
- **Certified Seed** is inspected and tested by a government agency for genetic purity, germination, and freedom from disease and weed seed. Only varieties registered by a government agency can be certified ([FAO, 2018](#)).
- **Quality declared seed (QDS)** is produced and sold by farmers or community-based organizations who are not registered seed dealers. Both modern varieties and landraces can be included. Government authorities identify which varieties are eligible and must inspect at least 10% of QDS fields ([FAO, 2018](#)).

Community-based seed production strategies can help farmers access affordable, quality seed in contexts where the formal sector is inactive or ineffective. In order to be sustainable, such schemes should be run as profit-making businesses, beginning with a thorough market assessment. In order to minimize the potential for crop failure, production sites should be located on irrigated land or in areas with consistent rainfall. Group production and bulking of seed from many farmers is often challenging due to poor

management and inconsistent quality. Farmers tend to keep their best seed for their own use, and it is very difficult to monitor the genetic purity of bulked seed from a large number of farmers.

An alternative to bulking is to help individual farmers grow and sell QDS seed. Quality control is easier since fewer producers are involved, and the market for QDS is broader since it can be sold both in the local community and marketed more widely outside the community. Regardless of the production strategy, marketing challenges for OPVs will persist since farmers tend to keep and regrow such seed rather than paying higher prices for certified or QDS seed.

One example of an effective seed production strategy was implemented by *Office de Développement des Eglises Evangéliques (ODE)*, an MCC/CFGB Partner in Burkina Faso. ODE trained 20 individual farmers in seed production, provided start-up inputs, and connected them to the national seed service for inspection and certification. In 2017, these farmers produced 34.7 tons of QDS maize, sorghum, cowpea and rice.

Community seed storage strategies can help farmers conserve genetically diverse landraces of traditional crops, while avoiding the temptation to consume for food during the hungry season. Seed banks, where farmers bulk and store seed together, used to be more common in CFGB-supported projects, but they have struggled with management and quality control issues and often ended once project resources were discontinued. To address the quality control issue, farmer groups supported by the Evangelical Fellowship of Sierra Leone, a Tearfund Canada/CFGB Partner, store seed in a common storage, but keep seed from each farmer in a separate container.

Seed storage in individual households is easier to manage, and training farmers in improved storage

methods (such as hermetic bags) has been an effective and long-lasting approach, though the temptation of consuming seed stored in the household is often a problem. Farmers working with the Diocese of Central Tanganyika, a Tearfund Canada/CFGB Partner, address this temptation by storing grain in plastic-lined, underground, hermetic pits which are kept sealed until needed.



The *Tabacsne* (Patience With Ourselves) group in Brass Village, Sierra Leone, store groundnut seed of individual members to avoid the temptation of using seed stock for eating.

Seed distribution: NGOs and government projects often include seed distribution as part of food security programming. One reason for this practice is to introduce new species. For example, green manure cover crops whose use in CFGB-supported SSA projects has increased from just a handful to over 20,000 farmers today was supported by widespread seed distribution.

A second reason for distributing seed in food security projects is to improve the genetics of an existing crop. However, not all “modern” varieties produced by the formal seed sector are “improved” over what farmers are already growing. For this reason, when introducing new varieties, farmers should only receive enough seed to test in small plots alongside a control plot with the farmer’s

regular variety. Results of these comparisons should be compiled and analysed before promoting the new variety more widely.

A third commonly cited reason for distributing seed is to create an incentive for farmers to participate in a project. Our experience has shown that this practice can confuse farmers and create a false impression that they are interested in training and other activities, when their real motivation is free seed. Projects which use this strategy should only do so in the initial year of a farmer’s participation, and they should make it abundantly clear that farmers will be expected to save seed for subsequent seasons.

Projects which require farmers to return seed from the harvest of that which they have been given, face additional challenges. Monitoring the genetic purity and quality of the seed is difficult, and the logistics of collecting, processing, storing, and redistributing seed create a huge burden for the NGO. Most projects are better off purchasing fresh, commercial seed each year, and encouraging farmers to share seed with their neighbors, but not bothering to monitor their compliance.

Finally, projects should work *with*, rather than compete *against*, local merchants. When NGOs or government import large quantities of seed into a community, they take business away from established seed dealers. These same dealers can be used to help procure seed, thus lowering the workload of NGO staff. Voucher systems also support local merchants and give farmers greater choice over what seed they obtain and from whom.

Partner Profile: Help Channel Burundi

**Jean Twilingiyumukiza, Agriculture
& Livelihoods Technical Advisor,
Central/West Africa**

Help Channel Burundi (HCB) was created in 2000 and registered as an NGO in 2003. Its initial mandate was to respond to the humanitarian crisis experienced by Burundi following the war of the

1990s. The organization now continues to work at food security, human rights, child-centred security, as well as environmental protection.

HCB has worked to reduce food insecurity in Kirundo, Rutana and Makamba provinces for some 10 years. Initial strategies included direct food aid, tree planting, contour lines for erosion control, and rehabilitating rural roads in a food-for-work arrangement. Following a 2016 situational analysis, Help Channel began searching for strategies that would enhance long-term local food production and food security. This resulted in the *Ikigega Iwacu* (produce storage granary in my household) Project, which began with MCC/CFGB support in 2016. The project has trained over 1267 households in six communities, including three where they worked in the past and three new ones. Project components included increasing agricultural production by promoting conservation agriculture (CA) and other good agricultural practices, and post-harvest handling and storage technologies.

Agriculture remains the main sector in Burundi and more than 90% of the population depends on farming for their livelihoods. The main food crops are maize, rice, cassava, sweet potato and cooking bananas. There are three growing seasons: Season A (long rains) runs from mid-September through February, when most farmers

plant maize. Season B (short rains) begins in mid-February and ends in May, and farmers focus on bean production. Season C (dry season) runs from June to September when cultivation is limited to marsh areas. Climate change, war and conflict, rapid population growth, soil and environmental degradation, and extreme poverty all contribute to food insecurity.

Despite these challenges, in the six communities where the *Ikigega Iwacu* project is being implemented, food security has notably improved. The average meals per day that participants reported eating went from 1.7 at the time of the baseline survey to 2.5 in 2019. Women's Dietary Diversity Score jumped from 2.5 to 4.4, while Monthly Adequate Household Food Provisioning went from 6.6 to 9.5 months. A recent evaluation also revealed that the quality of meals and the consistency of access to food was improved.

HCB has proposed a five-year project to MCC/CFGB to build on these successes, and to continue to address food insecurity in Burundi, by scaling up to new communities while continuing to work in the old ones. The new proposal aims to engage 144 community-based groups (3,840 households) with promotion of CA and other related topics in order to increase agricultural productivity, household incomes, gender balance and food security.



Kamikazi Jeanette (l), HCB Agronomist, visits CA field in the Gahe community.

Introducing Lilian Zheke, ALTA for Southern Africa

We are pleased to welcome Lilian Zheke as our new Agriculture & Livelihoods Technical Adviser (ALTA) for southern Africa. Lillian joins Neil Rowe Miller, based in Tanzania and Jean Twilingiyumukiza, based in Rwanda, to fill out the technical support team for Canadian Foodgrains Bank and Tearfund UK agriculture and livelihoods projects in Sub-Saharan Africa.



Lilian Zheke facilitates a session on marketing at the Malawi country-wide workshop.

Lillian is based in Harare, Zimbabwe, at the Tearfund office, and began serving in January 2020. Her priority countries will include Zimbabwe and Malawi, though she will also support programming in Zambia, Mozambique and Uganda.

Lillian has experience working in both government extension and the NGO sector. In addition to basic agricultural training, she brings strong skills in agricultural marketing, meteorology, and some experience with livestock promotion. She is a practicing Methodist Christian, and we are blessed to have her in our team!

ALTA Travel Schedules

Jean Twilingiyumukiza

9-13 March, 2020

Freetown and Port Loko, Sierra Leone

Project visit: AEL (Liberia) and EFSL (Sierra Leone)

18-20 March, 2020

Gicumbi & Bugesera Rwanda

Visit to RICA and Research sites

28-30 April, 2020

Goma, DRC

Meeting re country-wide Workshop

26-29 May, 2020

Bukavu, DRC

CBM/CBCA Project visit in Muku

Neil Rowe Miller

9-13 March, 2020

Freetown and Port Loko, Sierra Leone

Project visit: AEL (Liberia) and EFSL (Sierra Leone)

6-10 April, 2020

Kitui, Kenya

Kenya-wide Partner Workshop

10-17 May, 2020

Nebbi & Bidibidi, Uganda

Project visits

Lilian Zheke

30 March- 2 April 2020

Mutare, Zimbabwe

EFZ Familiarization visit

6- 9 April 2020

Bulawayo, Zimbabwe

BICC Familiarization visit

19 April- 2 May 2020

Teddington, UK

Tearfund Orientation

11-16 May 2020

Malawi

Ag CARE and CARD familiarization visit

25-30 May 2020

Harare, Zimbabwe

EFZ/Post harvest Training