

# Community seed banks in Malawi: an informal approach for seed delivery

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## **Contents**

Foreword .....	1
Introduction.....	2
Benefits of community seed banks .....	3
Key elements of community seed bank operations.....	4
What is involved in developing community seed banks .....	5
Key pre- and post-harvest training areas .....	6
Role of community seed banks .....	8
References.....	9

# Foreword

Groundnut is a major component of livelihoods of farming communities in the humid and semi-arid tropics. The crop grows well between latitudes 40°N to 40°S, under a wide range of agro-ecological conditions (altitude: from sea level to over 1500 m, rainfall 300–1000 mm). In most countries of East and Southern Africa (ESA), smallholder farmers, with no irrigation and almost no inputs, other than land and labour, grow the crop. These farmers rely on legumes such as groundnut for protein (12–36%), energy-high oil content (36–54%), incomes and soil fertility improvement. In many smallholder fields, productivity of legumes is still low, and in the case of groundnut, the yield gap is over 50%. Limited access to robust new varieties is one of the major drivers of low productivity, especially in smallholder agriculture. Many farmers still plant material that is obsolete and/or degraded and susceptible to folia diseases such as groundnut rosette disease, that can cause up to 100% yield loss.

In Malawi, we have learnt that farmers, when mobilized into groups and trained, can improve access to seed markedly increasing their productivity, profitability and food security. The Community Seed Bank (CSB), provides a framework for farmers to produce and access seed of improved crops within their communities. It also supports easy access to knowledge and can in the long run, support aggregation of grain for sale. A community seed bank is designed to allow farmers bulk quality declared seed (QDS) certified for grain production in their local community. Through the CSB farmers are provided seed on loan and pay back to the group an agreed amount, usually twice the borrowed quantity, while retaining the extra harvest. The seed that is paid back is then provided to other new farmers. In that sense, the CSB operates on the principles of the banking system of loans and payback with interest. We found that farmers using this approach in Malawi may travel over 80 km to source such QDS seed.

In the semi-arid ecologies of Tanzania, especially the Manyara region, where Africa RISING operates, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)-led team has now moved to the point to enhancing access to seed of other improved crops. And legumes and dryland cereals, being under invested crops, lend themselves to the CSB system. Accordingly, we have established community seed banks in Kongwa, Kiteto and Iringa districts. However, in order to ensure production of QDS, it is important to train farmers and extension staff on seed production and management. This training manual is designed to meet the information needs of trainers such as extension staff. It will be revised regularly as we update our knowledge from the experiences we learn over time.

Patrick Okori

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# Introduction

Seed banks are community-based institutions used for seed multiplication and distribution for members of a community. They are part of an informal system that may have several nodes of smaller banks working together to improve access to seed of improved varieties. Seed banks operate on commercial banking principles of investment, growth and lending to new customers. These are modelled on traditional storage systems used by farmers to provide free and easy access to traditional seeds under the condition that a farmer returns twice the amount of seeds he or she borrowed.

The vast amount (80–90%) of seed used by smallholder farmers in developing countries such as Tanzania is obtained informally from markets or fellow farmers. This informal approach ensures seed availability at the right time and right prices to farmers. The Community Seed Bank, also an informal system, can thus be an important approach for improved seed dissemination. But for community seed banks to succeed, it is essential that the target community's capacity for seed multiplication and dissemination is developed. Communities must be trained to: (i) produce seed, (ii) access knowledge on production and, (iii) manage themselves (organize). This training manual addresses the three outlined areas.

# Benefits of community seed banks

In many cases, after new seed varieties are developed and released in the market, the main challenge becomes how to improve access by farmers to these improved seed varieties. Access to seed of improved crops especially self-pollinated crops and or crops with low seed multiplication ratios like groundnut is difficult because the seed distribution systems of these crops are often weak. Additionally, the private sector is weary of investing in such crops because farmers more often than not, recycle their seed, reducing the business for seed investors. Moreover, the seed of self-pollinated crops such as groundnut can be multiplied by farmers with some training, with little risk of admixtures, and off-types can be easily removed. Isolation distances required are minimal and it is not necessary to set up expensive seed processing plants or seed certification units (Sentimela et al. 2004). This makes a strong case for using CSB to improve access to these seeds in smallholder farming systems. Other benefits are outlines below:

**For communities**, the seed banks will:

1. Improve access to seed of improved varieties by rural limited-resource farmers through improved availability and reduced prices
2. Enhance demand of improved varieties
3. Enhance dissemination and adoption of improved varieties
4. Enhance both pre and post knowledge for handling groundnut

**For researchers and extension staff**, the seed banks will:

1. Study adaptability of the new varieties under different cropping systems
2. Study dynamics behind seed diffusion

# Key elements of community seed bank operations

Effective functioning of seed banks requires the following preconditions: (i) strategic partnership for superintendence and sustainability, (ii) willingness by farmers and or farmer leaders to assume responsibilities, (iii) establishment of a strong monitoring plan, and (iv) enhancement of leadership skills in community leaders.

## The model

High-quality seed, of basic/foundation class, is provided usually by researchers and or breeders. Through strategic partnership with communities, the seed bank is established and the established partnership is then responsible for training and management of the CBS. The CBS then manages seed storage and distribution, being fed by the farmer clubs that are comprised of farmers who produce the seed. The seed pass-on program is demonstrated below and uses a multiplier effect doubling in every cycle. It should be noted that after five cycles fresh seed will be needed to refresh the seed bank.

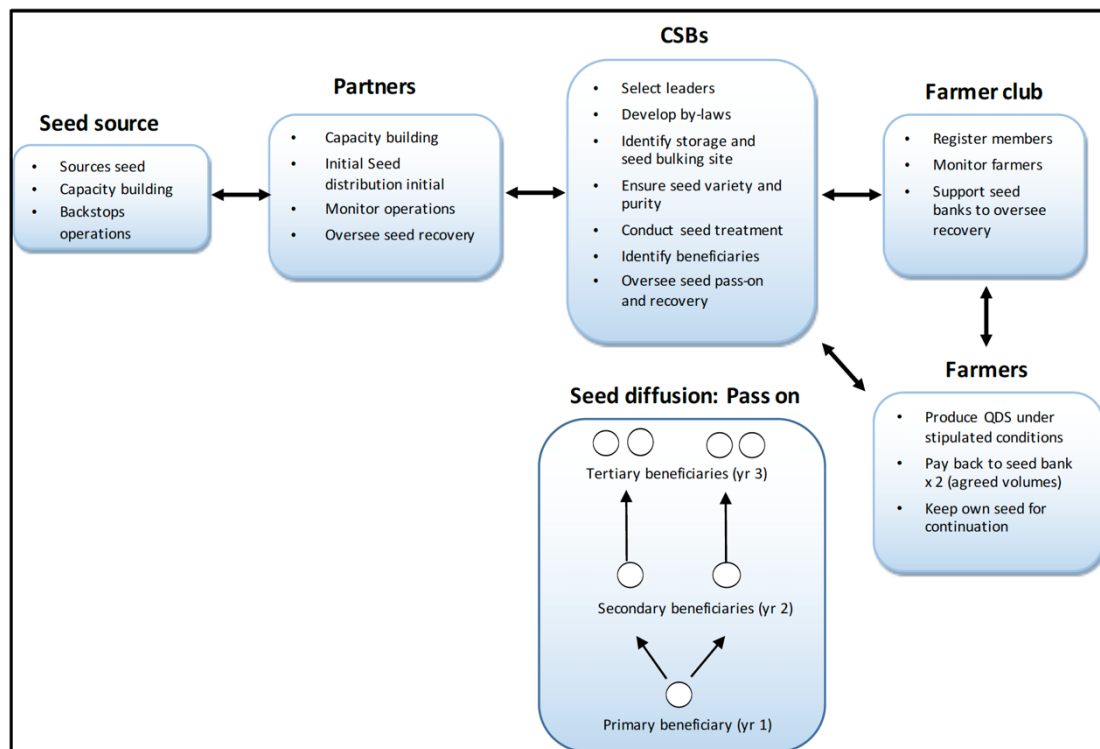


Figure 1. Model for community seed banks: ICRISAT approach used in Malawi.

# What is involved in developing community seed banks

**Tier 1: Community mobilization.** Focus group discussions are used to gain deeper understanding of community dynamics that would influence establishment and operations of a CSB. Mobilization is done through local leaders in the community or existing farmer clubs. It is important to engage traditional or village leaders, local political leaders and key farmers, who are often drivers of local policies and also need to be targeted in the awareness campaigns. Subsequently, awareness campaigns should be conducted involving different stakeholders such as extension agents, community leaders, farmers and the community to ensure complete understanding of CSB, its objectives and benefits and to gain a sense of local ownership once the seed bank is established. Village leaders may be asked to further provide awareness in their respective meetings with subjects.

**Tier 2: Farmer training.** In this tier, specialized training sessions are conducted to ensure appropriate implementation and sustainability of the system. Key areas of training include:

1. Leadership and group dynamics: This ensures that farmers acquire requisite skills for managing the seed banks.
2. Principles of seed production: This helps farmers differentiate seed from grain and provides them with ability to identify off-types to ensure quality seed is produced. These farmers will often be getting certified seed to produce quality declared seed (QDS) that in the case of Tanzania, has to be inspected by the National Seed Certification Agency. It therefore important to ensure sufficient training is given to lead farmers who enforce by-laws so that seed circulating within communities is of excellent quality. These trainings are structured based on crop phenology.
3. Principles of collective marketing: The ultimate goal of any investment in farming is to sell excess produce. It is also recognized in this set up that growth will occur but also seed will require replenishing. This training prepares farmers to understand market dynamics and also look at farming as business. It gives them opportunity to bargain for better prices and also provides a platform for them to generate resources to sources fresh seed.



## Key pre- and post-harvest training areas

**Principles of seed production:** Trained farmers, lead farmers and extension workers should have basic seed production knowledge to ensure purity is maintained and these include; site selection, land preparation, field isolation (groundnut being self-pollinated require just between 5–10m isolation distance to avoid mixtures during operations), seed selection, seed treatment, plant spacing, weed control, rouging, harvesting, post-harvest handling. Pigeon pea requires more than 100 m isolation distance, as such, care should be taken unless farmers are growing the same variety.

**Post-harvest handling:** Groundnut should be harvested without being wounded to avoid fungal infection. After harvesting, dry using Mandela Cocks or ventilated stacks. These minimize direct exposure of groundnut to the sun and late rains. For storage, groundnut can either be shelled or stored in unshelled form or in pods. Storing it unshelled is the best as the kernels are protected from external damage by the pods. It is important to store groundnut in cool, dry conditions, protected from rain and pests (particularly mice). Bagged groundnut, whether shelled or unshelled should not be placed directly on a concrete floor due to the risk of dampness that may cause mould to develop. Before bagging, pods should be dusted with Actellic Super to protect them from storage pests. Shelled groundnut is fragile and easily exposed to various agents that cause physical, chemical and biological deterioration. For pigeon pea, harvesting should be done when pods have reached 95% physiological maturity (most pods are brown). Ensure pods are further dried on the sun for ease of threshing.

**Tier 3: Group formation:** This is an essential part of the CSB and care should be taken when forming community groups. The key areas to consider are:

- The gender and age structure are the key drivers for the types of groups formed in a given community.
- Four groups are generally recommended in each community and these include; youth (<30 years), women, men and mixed groups.
- After awareness, secondary meetings should be held to allow farmers themselves to identify those willing to participate leading into group formation. With the help of a facilitator (e.g. local extension officer) the farmers can then develop operational structures for leadership.
- Each group should have a chairperson, secretary and a farmer-to-farmer leader. The chairperson provides group leadership, secretary records all group meetings proceedings including data coming from farmers and the farmer-to-farmer leader is the link between farmers and extension agents.

**Stages of group formation:** The selected leaders may be taken through the four stages of group development as proposed by Tuckman (1965): These stages are (i) forming (where the group is just starting to come together and is characterized by anxiety and uncertainty), (ii) storming (where conflict and competition are at their greatest), (iii) norming (group becomes a cohesive unit), and (iv) performing (stage marked by high productivity). The group leaders must be able to recognize and understand group behaviour at these different stages.

**Tier 4: Provision of start-up seed:** Once farmer groups collectively form the CSB and training is provided, each group is given start-up seed. A few farmers in each group commence the process. The amount of seed received varies with each crop. For crops with a low seed rate, less seed is given to farmers, for example; for pigeon pea, each farmer may receive 3 kg; for sorghum and pearl millet, 2 kg of seed is required. For groundnut, startup amount per farmers may go up to 10 kg. Each farmer receiving seed is expected to return twice the quantity of seed received to the seed bank or to the secondary beneficiary. Each group is expected to develop its own operational rules to ensure adherence to the group's vision and aspirations. Once harvested and seed recovery is done, each farmer is expected to keep his/her own seed. Farmers are also encouraged to sell excess seed to fellow members of the community willing to buy and depending on the volumes, it may be necessary to link farmers to markets especially in later years.

#### **Enhancing seed diffusion in communities**

- Pass-on seed i.e. seed recovered from one farmer is passed on to new beneficiaries: If one gets 10 kg, they repay 20 kg to the seed bank for two new farmers.
- Seed sales within the communities: Due to the networks formed within and amongst community members, farmers are aware where and when they can get QDS.
- Seed exchanged with other services i.e. labour: It often happens within communities where some farmers will put some of their seed as payment for certain tasks or members of the community will ask for seed in exchange for labour;
- Seed shared as gifts to friends and relatives: Culturally there is exchange of seed among farmers or relatives in form of gifts.

# Role of community seed banks

The CSB leaders are responsible for the following.

- Developing by-laws: These are simple rules and regulations that farmers in the group are supposed to follow.
- Monitoring: A team of farmers trained on seed production and variety characterization develop and implement a schedule for quality assurance for both pre- and post-harvest crop handling. They check on isolation distances, crop husbandry practices, availability of off-types in the fields and admixtures after harvest.
- Seed recovery: Ensure all farmers who accessed seed pay back in agreed quantities
- Identification of beneficiaries: Leadership in CSBs should already have in their database the names of new beneficiaries as soon as the initial beneficiaries get the seed
- Seed storage and handling: They should identify a suitable place for storing produce and also ensure the produce is free of moisture and pests.
- Seed distribution

A successful community seed bank ensures:

- Purity of seed variety
- Clean seed (avoid admixtures)
- High germination percentage
- Seeds free from pest and diseases (good storage and seed treatment)
- Good seed recovery and distribution
- Good knowledge transfer

Data collection: This helps to track the flow/dissemination path of seed

1. Type of crop in the seed bank
2. Amount of seed distributed to the seed bank and initial beneficiaries
3. Georeferences of farmers (keeping GPS data of beneficiaries)
4. Amount of land covered (acreage)
5. Total production by farmer and the producer group
6. Seed recovery data
7. Seed flow: any seed sharing or selling by individual farmers (who, where)
8. Amount consumed
9. Names of secondary beneficiaries. These should be known at the onset of the activity

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