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Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

# HOW TO DEVELOP AND MANAGE YOUR OWN COMMUNITY SEED BANK

*Farmers' handbook (updated version)*



BOOKLET

2

of 3

## TECHNICAL ISSUES

Ronnie Vernooy, Guy Bessette, Bhuwon Sthapit  
with Arnab Gupta



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YOUR OWN COMMUNITY SEED BANK**  
*FARMERS' HANDBOOK (UPDATED VERSION)*

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**BOOKLET 2 OF 3**  
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Bioversity International 2020

The Alliance of **Bioversity International** and the **International Center for Tropical Agriculture (CIAT)** delivers research-based solutions that address the global crises of malnutrition, climate change, biodiversity loss, and environmental degradation.

The Alliance focuses on the nexus of agriculture, environment, and nutrition. We work with local, national, and multinational partners across Africa, Asia, and Latin America and the Caribbean, and with the public and private sectors and civil society. With novel partnerships, the Alliance generates evidence and mainstreams innovations to transform food systems and landscapes so that they sustain the planet, drive prosperity, and nourish people in a climate crisis.

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# HOW TO DEVELOP AND MANAGE YOUR OWN COMMUNITY SEED BANK

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## BOOKLET 2

### TECHNICAL ISSUES





# AN EXPERIENCE FROM ASIA

## Who we are

We are members of the Bajrangi Community Seed Bank in the town of Balapur in the Bundelkhand area of central India. Our community seed bank was established in August 2016. Although Balapur has its own small, local market, the nearest market for large amounts of agricultural produce is at Karwi, about 12 km away.

Currently, we conserve seeds of chickpeas, green grams, lentils, linseed, mustard, peas, pigeon peas, sesame, sorghum, rice, and wheat. We grow rice, wheat, and chickpeas for the market. The other crops are for our own use, although they are sometimes also traded in the local market, but only in small quantities.

We receive regular technical support from the Deendayal Research Institute and Bioversity International.



# What we want to share with you

We would like to introduce you to a number of technical issues concerning the operation of a community seed bank, including key principles and practices that will help you along the way. **Every community seed bank requires members who have mastered key technical aspects.** This will take time and effort.



# 1. Crop selection and seed collection

**Which crops and varieties do you want to conserve** in your community seed bank? The priority is usually crops and varieties that are important in terms of the food security of members of the community: women and men, young and old, better off and less well off, nearby farmers and farmers farther away.

Many community seed banks also pay special attention to crops and varieties that have been lost or are becoming rare and to those with traits preferred by the community: for example, the colour of the grain, the height of the plant, the taste. Women and men often have different preferences, and this should be taken into account when deciding what to conserve in the community seed bank.

Increasingly, farmers are becoming more interested in crops and varieties that respond well to the changing climatic conditions they are facing.

It is important to determine whether you have sufficient human and technical capacity to conserve a large number of crops and varieties. You may wish to select only a small number of crops or varieties of one crop to start, then, as you gain more experience, add others.





## 2. Seed health and cleaning

A critical factor in seed collection is obtaining **disease-free seeds**. The best techniques include:

- Doing a field inspection
- Sampling from different parts of a field
- Collecting seeds from a number of healthy plants
- Avoiding plants near the edge of the field, as they might be the result of crosses with other varieties
- Paying careful attention to choosing disease-free plants, panicles, or fruit

After collection, **reject any seeds that show signs of insect pests or diseases** and repeat this process during cleaning, as insects and disease can multiply when seed is stored.

You may ask the local extension agent to supervise the cleaning process and, where they exist, farmers' field schools can share and support the use of the most appropriate techniques.

sl no	Accession no	Crop	variety	Farmer name	Community	date of accession	qty (g)
1	DL08-001	Rajma	Kalash	Suresh		16/3/2015	100g
2	DL08-002	Rajma	lohit	Sarala		16/3/2015	100g
3	DL08-003	Rajma	Chetvi	Ranjit		17/3/2015	200g
4	DL08-004	Rajma	Pink	dohar		18/3/2015	200g
5	DL08-005	Mustard	Desi	Hanvesh		14/3/2015	100g
6	DL08-006	Mustard	Pusa Mehek	Samba		13/4/2015	250g
7	DL08-007	Cow Pea	Desi Safed	Phuloc		13/4/2015	100g
8	DL08-008	Y. Mustard	Sonal	Kalpeesh		13/4/2015	100g
9	DL08-009	Mustard Sesame	Desi Krishna	Hanvesh Ravi		14/3/2015	250g
10	DL08-010	Sesame (W)	Desi	Subhash		16/08/2015	200g
11	DL08-011	Bl. Sesame	S-01	Kalash		17/3/2015	100g
12	DL08-012	Bl. Sesame	Local Black	Kashi		17/3/2015	150g
13	DL08-013	Sesame (W)	Safed Sona	Pulakesh		18/08/2015	150g
14	DL08-014	Moong	Desi	Sarpanch		19/8/2015	150g
15	DL08-015	Bl. Gram	Kala Sona	Mahim		19/8/2015	150g
16	DL08-016	Black Gram	Ravi	Samarth		19/8/2015	200g
17	DL08-017	Cowpea	Local White	Abir		19/8/2015	100g
18	DL08-018	Cow Pea	Hariyali	Jabbar		20/8/2015	100g
19	DL08-019	Moong	VM-31	Shaipal		25/8/2015	200g
20	DL08-020	Kabuli Chana	K-9	Umesh		29/6/2015	200g
21	DL08-021	Chick Pea	Desi Kal	Kamala		29/6/2015	100g
22	DL08-022	Chick Pea	Desi Kal	Timor		29/6/2015	200g
23	DL08-023	Wheat	Lok-1	Nehal		30/6/2015	200g
24	DL08-024	Wheat	CSW-18	Nilimesh		15/3/2015	200g
25	DL08-025	Sorghum	Desi	Rabesh		16/3/2015	100g
26	DL08-026	Sorghum	Cheeni	Sarala		18/3/2015	200g
		Bajra	PM 218	Saheb		29/7/2015	200g
		Bajra	Desi	Umesh		30/7/2015	200g

### 3. Registration of seeds

At a minimum, maintain a **simple log book** in which seed deposits and withdrawals can be registered, noting date; the name of the farmer, village, or community where the seed was collected; and the name of the crop and variety.

If a scale is available, then the quantity of seed should also be included. That will allow calculation of how much seed the community seed bank processes in a season or a year.

Some well-organized community seed banks maintain two registers: one for incoming and one for outgoing seeds. Others keep more than one register for different purposes, such as a register of the farmers who contribute to seed bank activities; a biodiversity register with all possible details of the seeds donated; and a register listing lost varieties.

A **biodiversity register** can include the local name of the genetic resource, its specific use and value, current status, general characteristics, method of cultivation, related agroecology, the extent and distribution of its cultivation, its capacity to tolerate stresses in the field, the perceived nutritional value, and cultural and religious uses (if any).



## 4. Seed processing and storage

**The most important factor in seed preservation is to make sure that seeds are as dry as possible and free of weeds, dust, and stones.**

To keep seed clean, healthy, and viable, proper storage equipment and methods are critical.

Many community seed banks use traditional methods for storing seeds and planting material: mud, bamboo, straw, dried bottle gourds, etc. They use the sun to dry seeds and then cool them before storage in mud-sealed containers. These methods are very effective.

Recently, some community seed banks have begun to combine traditional storage structures and practices with modern equipment and practices, such as airtight, transparent plastic or glass jars, metal bins and even SuperGrain bags (multi-layered plastic bags that provide a gas and moisture barrier). Zeolite beads (aluminosilicate-based absorbents) have also been introduced to control moisture levels inside containers; these beads are very effective.



## 4. Seed processing and storage

Except in a few cases, most community seed banks do not have a reliable mechanism to control temperature and humidity, which is key to maintaining genetic material over a long period. Therefore, regular moisture tests are an important practice in monitoring the quality of stored seeds.

Important factors to remember:

- √ The **temperature** inside the facility must not be too warm (below 35 degrees Celsius) to prevent easy germination of seed
- √ The containers (whether they are made of glass, plastic, or clay) must be **clean** to prevent infestation by pests or disease
- √ The **moisture content** before storage must be low to prevent rapid germination





## 5. Seed monitoring

To keep the seeds stored in a community seed bank healthy, we recommend **verifying seed quality regularly, i.e., once a month.**

This can be done visually by checking the containers and/or removing part or all of the seeds from a container and verifying moisture level and pest and disease incidence.

When problems are observed, immediate action should be taken to prevent the spread of mould, disease, or pests. Remove any infested seed, clean the container thoroughly, and dry the remaining seed again before replacing it in the container.



## 6. Seed regeneration

Many community seed banks **regenerate the seeds** they conserve **annually, so that they remain well adapted to local conditions.** Where they exist, farmers' field schools or agriculture colleges can carry out this regeneration task.

In the case of longer-term storage, grain seeds may be regenerated every 5–7 years and oil seeds every 3–4 years.

Regeneration can be done on a piece of land that belongs to the community seed bank or on land offered by members. Each member then takes responsibility for one or more crop varieties.

Some community seed banks require all members to regenerate at least one crop variety from the collection each year.

Some community seed banks do more than regeneration for local use; they produce local varieties of seed on a large scale for sale. To be able to do that requires sound production and marketing knowledge and skills.

Germination tests must be conducted at regular intervals to monitor regeneration potential.



# 7. Obtaining seed from the community seed bank

**Rules or regulations** concerning **access to seed from the community seed bank** should be agreed to by the community seed bank members.

In practice this means:

- √ Deciding whether to give access to members only or to include non-members
- √ Adopting the principle of first-come first-served or establishing equitable or targeted distribution
- √ Establishing a plan for repayment of seeds and the return rate
- √ Agreeing on how to deal with cases of delayed repayment or failure to return seeds
- √ Recording distribution in a well-organized manner

**We recommend keeping records of the flow of all seeds** so that we know who benefits and who does not, which crops and varieties are in demand and which are not, and how much seed is required in a season or a year.



**DRY BOX #011**



**DRY BOX #010**



# Summary

This booklet addresses the following technical issues:

- 1. Crop selection and seed collection** is about the kind of crops and varieties you want to collect and conserve in your community seed bank.
- 2. Seed health and cleaning** is about obtaining samples and selecting disease-free seeds.
- 3. Registration of seeds** can be carried out by using and maintaining various types of log books.
- 4. Seed processing and storage** introduces traditional and modern methods for keeping seeds as dry as possible and free of weeds, dust, and stones.
- 5. Seed monitoring** recommends verifying seed quality regularly.
- 6. Seed regeneration** describes various ways to fulfill this task.
- 7. Obtaining seed from the community seed bank** is about establishing rules or regulations concerning the flow and use of seeds by the community.

This is the end of our second booklet on developing and managing a community seed bank, **Technical issues.**

We will now turn to booklet 3, **Management, networking, and policies and a final checklist.**

***On to the next booklet!***

# About the authors

**Ronnie Vernooy**, Bioversity International, Wageningen, the Netherlands.

Ronnie joined Bioversity International in October 2011. He has worked on questions related to the conservation and sustainable use of agricultural biodiversity for more than 25 years in countries such as Bhutan, China, Colombia, Cuba, Honduras, Mongolia, Nepal, Nicaragua, South Africa, and Vietnam. His work focuses on the policy and legal aspects of safeguarding plant genetic resources and their sustainable use, both *ex situ* and *in situ*.

**Guy Bessette**, independent consultant, Gatineau, Quebec, Canada.

Guy has worked in development communication, social learning, and natural resource management in Africa and Southeast Asia. He currently supports various Bioversity International initiatives related to seed systems.

**Bhuwon Sthapit** (in memoriam)

Bhuwon, a plant breeder, joined Bioversity International in 1997 as an *in situ* conservation specialist, first based in Malaysia, then India, and, until his death in August 2017, Nepal. His major research interests included participatory methods to assess and use agricultural biodiversity, participatory crop improvement, in situ and on-farm conservation, home gardens, community-based biodiversity management, and community seed banks.

**Arnab Gupta**, PhD (Seed Science and Technology) is an agroecology and seed systems scientist based at the Wageningen Center for Development Innovation, the Netherlands. Before moving to the Netherlands, he worked in India to support community seed banks with a special interest in dry-storing seed storage theory and practice. One of his responsibilities was to train farmers and genebank officials in the use of Zeolite beads technology for enhancing seed shelf life in genebanks and community seed banks.

















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