

Conservation of Seeds:

Sustainable seed banking and long-term storage

Faith Juma, East Africa seed bank manager
Emma Mudd, Global seed bank manager



Introduction



Staff introductions



Faith Juma



Emma Mudd

The what and the why

- What is a community seed bank?

A type of seed bank that exists to serve an individual community /a small collection of communities. Often owned or operated by members of community within which they are located.



Learning objectives

1

Identify local, low-cost solutions for effective community seed banking

2

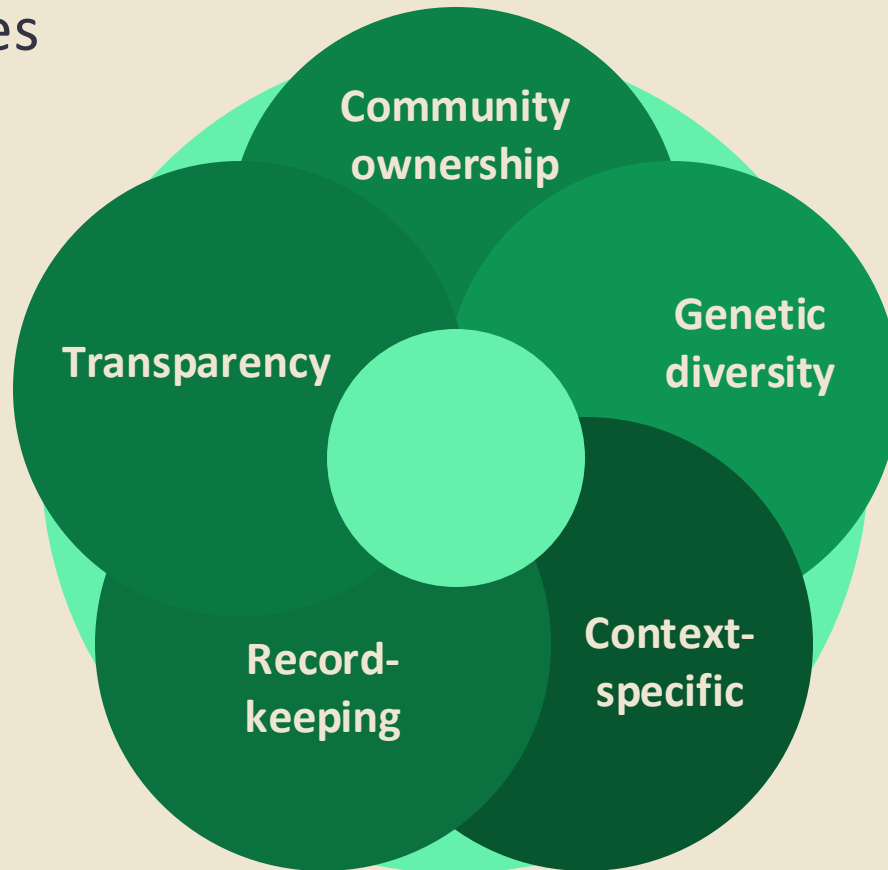
Explore equitable and effective seed exchange practices

3

Learn sustainable ways to store seeds for the long term

Sustainable Seed Banking

Guiding principles



Sustainable Seed Banking: Planning and Organization

Vision and purpose

Purpose could be based on the functions of the seed bank or the mode of operation.

- What will be the functions of your seed bank
 - assist farmers to access seeds in need/ improving crop genetics/for preservation and maintaining seed germplasms) or the combination.
- What will be the mode of your operation ?
 - Institutional model? Support from NGOs/other external sources
 - Cooperative model? Member-driven , support through membership fees or commitments. Could be individuals/groups

Community Seed Bank Committee

POSITION	Role & Responsibilities
1. Seed bank manager	<ul style="list-style-type: none">- Organize meetings (dates & place)- Visit and remind members who failed to repay- Ensure good and efficient storage & post harvest treatment
2. Seed bank distribution manager	<ul style="list-style-type: none">- Record all members who paid and those who didn't- Organize distribution of seeds
3. Treasurer	<ul style="list-style-type: none">- Manage all financial elements conducted in the seed bank
4. Record manager	<ul style="list-style-type: none">- Record weight of seeds borrowed and seeds reimbursed- Record contributions of each member
5. Maintenance manager	<ul style="list-style-type: none">- Identify new measures to control the seed bank from any form of attack- Seed monitoring

Crop selection

- Include staple crops and underutilized crops
- What's important to stakeholders?
- What is possible given budget, staff, resources?
- How will seeds be documented and registered?



Site selection



Management

- Volunteers or paid staff?
Responsibilities? Training?
- Open access or membership-based?
- Rules for borrowing, returning, access?



Sustainable Seed Banking: Operations

Seed collection and multiplication

- Grow onsite, wild-harvest, partner growers?
- Healthy, high-quality, pure seed
- Clean, dry and sort
- Restock as needed



Record-keeping

Consistency

- Keep data collection consistent
- Larger seed banks should use accession

Seed data

- Label all containers
- Source
- Species, variety, uses
- Grow-out data

Transaction data

- Deposits
- Withdrawals
- Date, name of farmer, type of seed, quantity

Monitoring

- Storage conditions
- Seed quality
- Quantity, supply/demand

Record-keeping

Seed Bank Growout Plan 2024-2025 (Week 30-29)

Scientific Name	Common name	Variety	Accession #	Germ %	Where	Plot	How	When	# of seeds	Seeding Date	Transplant Date	Planted # of plants	Survived # of plants	Spacing	Bed feet	Square Bed feet	Flowering Date	Growing comments	First Harvest Date	Removal Date
<i>Vigna unguiculata</i>	Cowpea	Sangaraka	23054FL-231D	N/A	GO		TP 2x	30	24 1x	7/25/24	8/6/24	24	22	12" 2 row	12	36	10/22	putting on biomass like crazy, vining but also crawling.	11/18/24	12/10/24
<i>Paophocarpus tetragono</i>	Winged bean	Thai	07036FL-081E	98%	GO, LL	Trellis	TP 2x	32	50 1x	8/6/24	8/28/24	24		22" 8" 1 row	17	51	10/29	struggling to get started, 2 distinct phenotypes and only one is right so it will need to be grown again	1/13/25	2/26/25
<i>Apios americana</i>	Groundnut		12078FL-232E	N/A	GO	Trellis	DS (tu)	33	n/a	n/a	8/13/24	14		13" 12" 1 row	16	48	10/22	2 tubers per hole, sprouting randomly throughout bed	1/28/2025	1/28/2025
<i>Capsicum baccatum</i>	Hot Pepper	Rainforest	23058FL-231D	N/A	GO	SGO	TP 2x	34	30 & 23 1x	8/22/24 & 9/26/24	11/5/24	36		33" 18" 2 row	24.5	73.5	12/30	first tray went missing, reseeded 9/26 23 seeds; leaf crinkling and frost damage	4/3/2025	5/1/25
<i>Solanum melongena</i>	Eggplant	Listada de Gandia	20100FL-201D	N/A	GO	SGO	TP 2x	36	50 1x	9/4/24	9/30/24	48		45" 18" 2 row	37	111	11/5	spotty yellowing on lower leaves, caterpillar damage, prolific producer, no problems once pests knocked back and micros applied	1/13/25	3/10/25
<i>Cajanus cajan</i> (long dur)	Pigeon pea	Black			LL, MT, MS, CG, SA, R			36												
<i>Helianthus tuberosus</i>	Jerusalem Artichoke				harvest tubers!	MT, RF		49												
<i>Pachyrhizus erosus</i>	Jicama		00040FL-171E (harves		LL, RF, MS			?												
<i>Capsicum chinense</i>	Sweet Habanero	Iquitos	23002FL-231D	N/A	GO	SGO	TP 2x	4	20 1x	1/9/25	2/18/25	17		13" 12" 2 row	8	24	4/2/25	many dying off, maybe irrigation problems... pulling off flowers until rainforest pepes are done? can use isolation bags?	6/26/25	
<i>Manihot esculenta</i>	Cassava				harvest roots!	SA	Rain-fed	2												
<i>Canavalia ensiformis</i>	Jack Bean				harvest seeds for farm!	SA	Rain-fed	2												
<i>Phaseolus lunatus</i>	Lima bean	Pima Orange	05049FL-051D	N/A	GO, UG	Trellis	TP 2x	6	21 1x	2/6/25	2/18/25	9		9" 18" 1 row	16	48	3/31	some aphids, looks like drought stress, pods not filling some caterpillars, female flowers matured first	5/5/25	7/24/25
<i>Cucurbita moschata</i>	Seminole Pumpkin	Ingram Billie	92029FL-162E	98%	GO	NGO	TP 2x	7	38 1x	2/18/25	3/11/25	22	??	2' 2 row	23.5	70.5	4/14/25		6/16/25	8/6/2025
<i>Phaseolus vulgaris</i>	Common bean	KAT B1 (bush)	24008FL-241D	N/A	GO, SA	NGO	TP 2x	8	50 1x	2/18/25	3/11/25	40	??	12" 3 row	14	42	3/31/25	some dying randomly	4/28/25	5/27/25



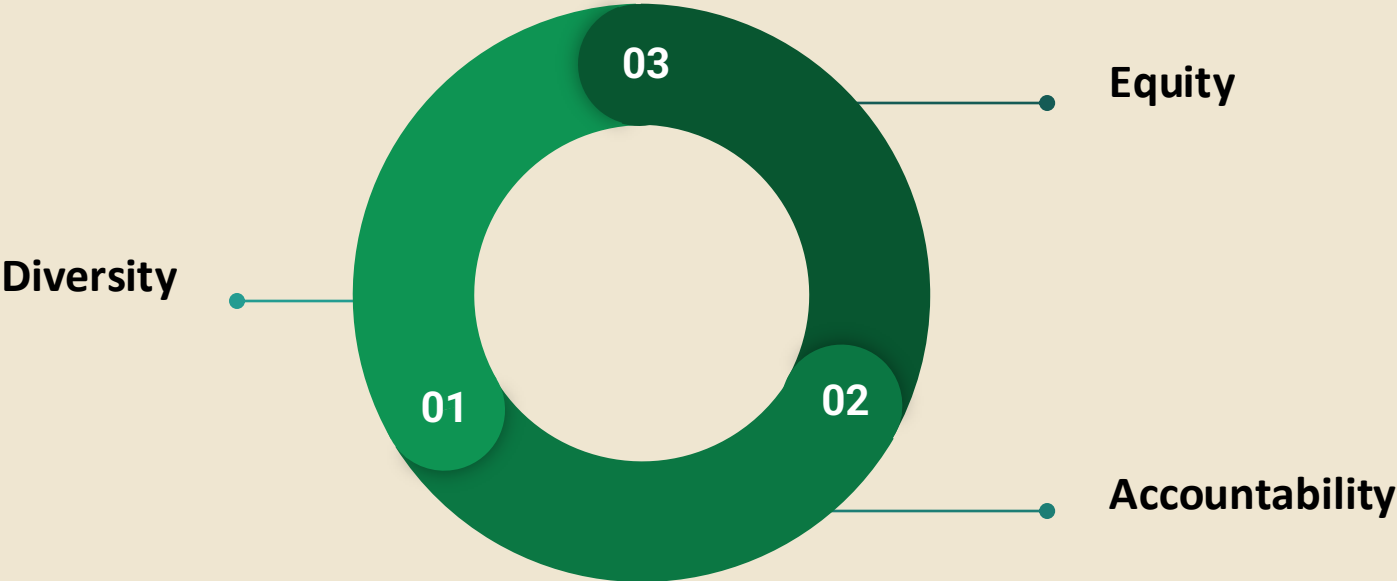
Capacity building

- Ongoing trainings on:
 - selecting, cleaning, storing & record keeping
 - Management
 - Leadership
 - Group dynamics



Seed Distribution and Exchange

Priorities for distribution



Maintain genetic diversity

- Diversity → resilience
- Emphasize underutilized crops
- Open-pollinated varieties, not hybrids



Accountability

- Recall the record-keeping considerations mentioned above
- Keep staff accountable
- Make sure to collect feedback from farmers
- Necessary to equity



Equity considerations

- Review rules, adjust if needed
- Make information accessible
- Consider marginalized groups



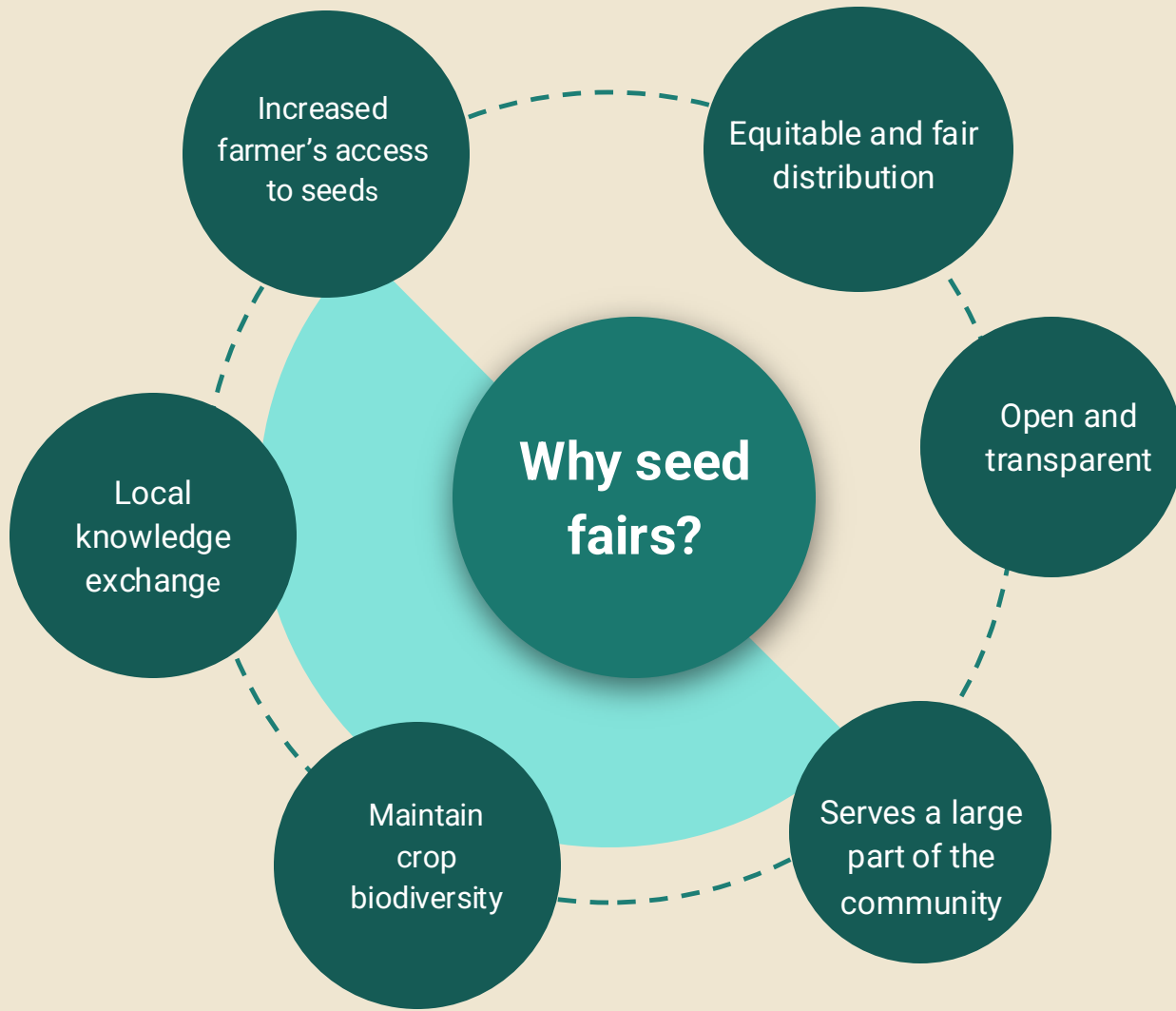
Options for systems

- According to the African Centre for biodiversity, The distribution and sale of any non certified seeds is considered illegal.
- Seed exchange, seed fairs and seed swaps are potential for seed distribution than in markets.
- Seed distribution can happen in seed bank through:
 - regular access
 - seed fair/seed swaps



SEED FAIRS/SEED EXCHANGE

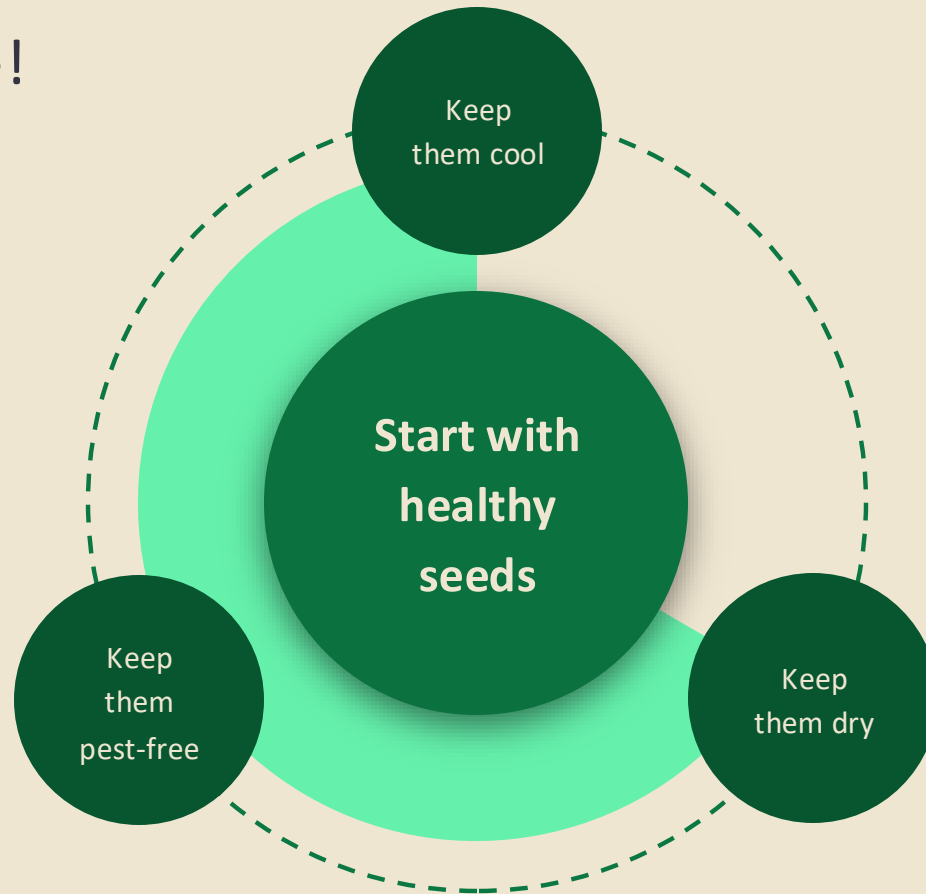






Seed Storage

Seeds are alive!



Seed types

Orthodox

Intermediate

Recalcitrant



Drying

Ideal seed moisture content for storage is 3- 12%, depending on the species and behavior

Simple ways to tell:

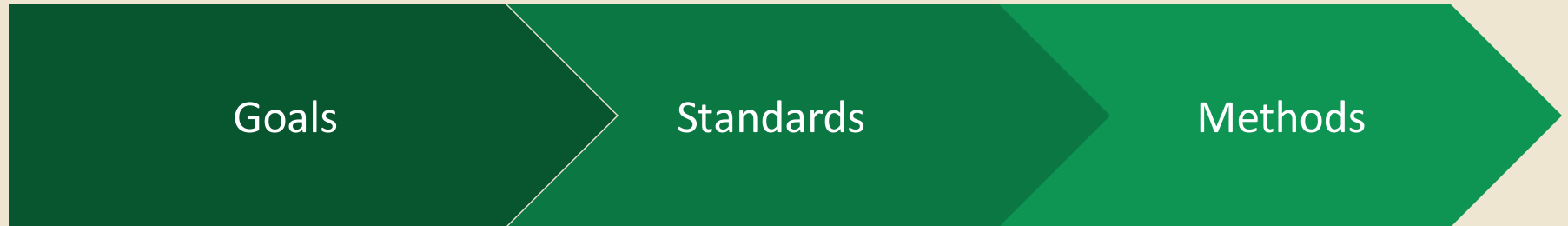
I. Bend & bite test

(if dried seeds are bent, they don't bend easily, if you bite/press a fingernail, it doesn't leave a mark and breaks easily)

ii. Salt jar test



Storage options



Traditional methods



Airtight containers



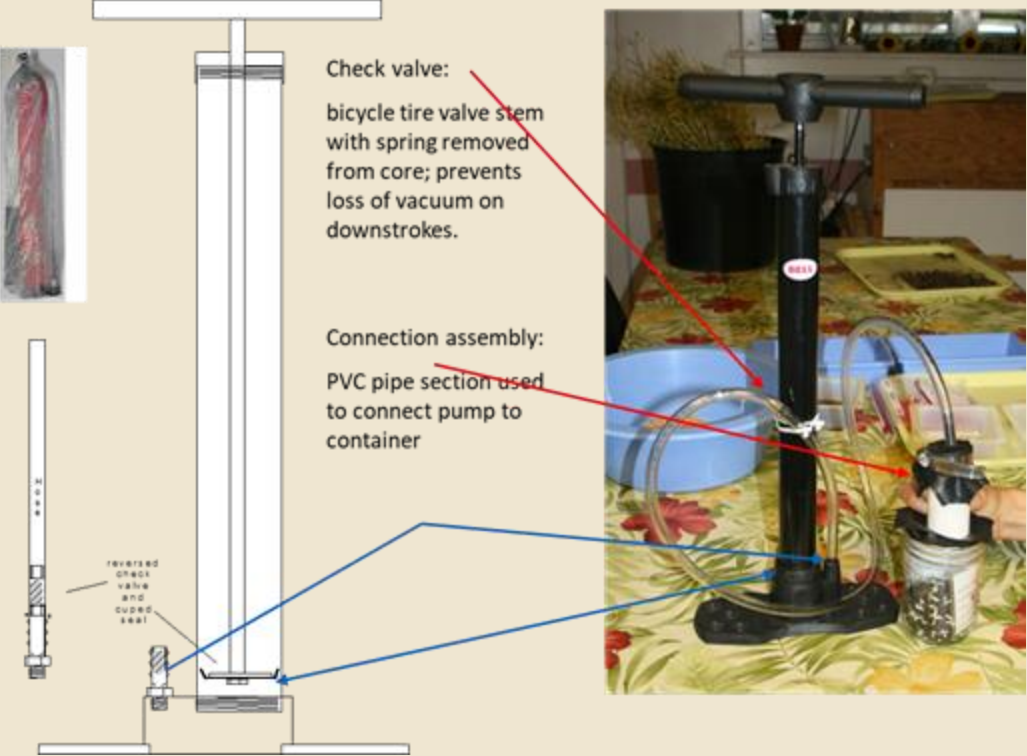
Desiccants



Vacuum sealing



Bicycle pump vacuum sealer



Infrastructure options



<https://www.echocommunity.org/s/w/resources/15bef2a3-b247-44fe-b9ae-9ec2de9dbfa3>

Conclusion



Plan Together

Share Fairly

Protect What You Save