

Farmer's seed diversity and seed conservation practices in Nakuru Kenya

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Introduction

Farm-saved seed is existential for agriculture and nutrition in Kenya. Crop varieties of most vegetables, pulses, tuber crops and cereals almost entirely depend on farmers' breeding and seed production. Genetically, local cultivars are the result of generations of farmers' intuitive knowledge in plant breeding.

However, these cultivars are insufficiently described and threatened with extinction. This is partly due to various reasons:

- Low attention to orphan crops
- Sole attention of the private sector to crops with high commercial value.
- Efforts within the farming community itself are scattered,
- Little effort towards developing farmer-led plant breeding.
- Appropriation of traditional seed by national research institutions and seed companies.
- Plant Variety Protection (PVP) and patents threaten the free use of seed and farmers' rights.

As a suitable support strategy, Seed Savers Network Kenya together with Agrecol decided to test the suitability of a commons approach, that enables free access to seed and supports farmers to characterize and describe their existing traditional varieties. The approach consists of a material transfer agreement, that is similar to an Open Source Seeds (OSS) license introduced by Agrecol in Germany a few years ago. Fully described local varieties will be protected in this way by the Seed Savers Network.

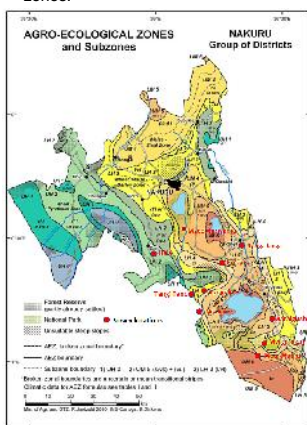
The concept of OSS is explained quickly via scanning the link to the following 1 minute video



Materials and methods

Field surveys were undertaken in a February 2022 and in August 2023.

The first seed study was conducted with 10 farmer groups across Nakuru county reaching out to 244 individual farmers (68% female and 32% male respondents). Besides this main tool using a formal questionnaire, focus group discussions, village walks, characterization trials, group ranking exercises, individual in-depth interviews with 11 farmers were carried out. Farmers are located in very different agro ecological zones.



Rainfall is ranging from about 600mm to 1200mm with 3 to 6 months usable cropping season per year.

Annual daily max temperature is near 26C, with up to 3C variation between the sites mainly determined by the altitude of villages ranging from 1600 to 2400 metres.

This highlights that local cultivars are subjected to a very broad range of ecological factors.

In the course of the years 2022 and 2023 SSN and farmers worked on characterizing 10 crop species with a total of 62 local varieties. Each cultivar was planted in 2 locations with one replication.

Results

How widespread are crops and varieties?

	Crops	% of growers	No. of varieties
Cereals	Maize	97,5	15
	Millet	12,1	5
	Sorghum	11,6	2
Beans / pulses	Phaseolus vulgaris	50-85,6	13
	Garden Peas (minji)	70,2	6
	Dolichos	26	3
	Broad beans	19,7	9
	Cowpeas	14,1	4
Vegetables and others	Pigeon pea	13,6	2
	Kales Sukuma	88,5	4
	Wiki	85	3
	Spinach	84,1	2
	Spring onions	70,7	6
	Black nightshade	69	1
	Kahurura melon	65,7	9
	Pumpkin	58	2
	Amaranth	52,8	2
	Coriander	43,7	5
Tubers	Spider plant	42	7
	Tomato	31,8	1
	Comfrey (Mafaki)	15,6	1
	Butternut	9,4	3
	Potato	6,2	8
	Sweet potatoes	22,5	2
	Cassava	16,7	2
	Arrow roots	8,2	1
	Yam		

Percentage of farmers that can meet at least 3/4 or more of their seed and food needs from their own production

Criteria	Before	Today
Food security	37%	88%
More species grown on farm	4%	88%
Growing drought tolerant crops (cassava, sorghum, millet)	32%	79%
Perennial fruit trees	24%	75%
Strong culture of seed sharing / banking	38%	87%
Total new groups (2 yrs)	32%	61%
Total old groups (6+ yrs)	25%	90%

Crops tested in the field for cultivar description

Crop	Cultivars	OSS descriptors
(1)Pumpkin /Cucubita maxima	8	24
(1)Tomato (Solanum lycopersicum)	4	24
(1)Irish Potato (Solanum tuberosum)	8	23
(1)Garden Pea (Pisum sativum),	4	21
(1)Sweet Potato (Ipomea batata)	11	20
(1)Bean (Phaseolus vulgaris)	7	19
(1)Bean (Phaseolus coccineus)	7	19
(1)Black Night Shade	4	19
(1)Spring Onion (Allium fistulosum)	5	14
(1)Swiss Chard, (Beta vulgaris)	4	12

- Farmers grow on average 16 crops. Due to the seed banking activities farmers diversified more and the older groups now cultivate 22 crops on average.
- Many villages are rather isolated and seed exchange between villages was limited. Some villages even reported that almost all seed is purchased today.
- The old traditional practice of seed exchange is lost in many places. Therefore, intraspecies diversity is rather low and the majority of farmers just grow a single variety per crop species.



• The OSS characterization acted like a farmer field school. Farmers became highly motivated and the learning exceeds the simple description of plants by far.

• The combination of seed banking and characterization of crops brings much more diversity back to the villages. This creates much enthusiasm among the farmer groups. They realize how this helps them to overcome the challenges of drought and climate change and it helps them to earn additional income.



Farmers' conclusions



Francis Ngiri from Makongo village is enthusiastic about his seed bank. After 10 years of collection is now stored 103 local species. He states, "we want to demystify the narrative that the seeds are made from laboratories and farmers are not able to produce their own seeds, we want to show the world that we have been the main breeders over the decades, we have been selecting our seeds and maintaining them but now we are trying hybridization and we hope that we will get good results."



Beatrice Wangui of Belakom organic farmers, states, "I am so passionate about this exercise, I have learned so much, especially about cherry tomatoes and black nightshade. We as a group of women now have a greater understanding of each kind of cherry tomato, including the fruit colour, leaves, and overall behaviour of each variety. Our group is now the only one with cherry tomato seeds. Someone from Nairobi called me last week and asked for the red cherry tomatoes, and now we may earn some money by selling."

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