30 Uganda

The Kiziba community gene bank

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Origin of the gene bank

The Kiziba community gene bank, located in Kabwohe, Kiziba parish, in the Sheema district of Uganda, was started in 2010. Focus group discussions and household surveys had revealed that some varieties of beans were becoming rare and others were no longer available in the area. Obtaining good-quality seed was also a problem, as most farmers relied on exchanges with fellow farmers, shops and markets. The lack of quality control among these sources was resulting in the rampant spread of seed-borne diseases in the area. Farmers also expressed a need for a facility where they could store some of the varieties that were less popular in terms of market, yield and taste, for example, so that they would be available in the future to meet unforeseen needs that may not be important at present. A series of meetings among farmers, Uganda's Plant Genetic Resources Centre and Bioversity International led to the realization that a community gene bank would solve these problems and provide farmers with a viable source of diverse, locally common bean seeds.

The seed supply journey

With technical support from Bioversity International and the Ugandan National Agricultural Research Organization and financial support from the United Nations Environment Programme's Global Environment Facility, farmers worked to save the seeds that formed the starting capital of the community gene bank. The first beneficiaries, about 100 farmers, returned twice the number of seeds borrowed from the gene bank, and that trend was repeated in the seasons that followed. By the end of 2012, 200 farmers had benefitted from the gene bank and, to date, 280 farmers have received varieties of common bean (*Phaseolus vulgaris*) seeds from the bank, with demand for some varieties surpassing the supply (Plate 20). The community gene bank management committee and the beneficiary farmers not only plant the seeds they receive from the gene bank, but also undertake careful observations of the varieties they plant to increase their knowledge and document the characteristics of the various common bean varieties – in the garden, in the store, in the market and 'in the mouth' (Tables 30.1 and 30.2).

Table 30.1 Characteristics of common bean varieties available in the gene bank

Variety	*Farmer-preferred characteristics*	*Limiting characteristics*
Nambale long (Kachwekano)	High market value, withstands adverse weather conditions, tasty, can be stored for long periods without being destroyed by weevils	Late maturing (four months to harvest)
Nambale short	High market value, withstands adverse weather conditions, tasty, can be stored for long periods (four months) without being destroyed by weevils	
Yellow short	Tasty, especially when cooked as katogo (mixture of beans, bananas, cassava or sweet potatoes), matures early (2.5 months), cooks quickly due to the soft testa (1.5 hours)	Susceptible to weevils
Kankulyembarukye purple	Tasty, especially when cooked as katogo, matures early (2.5 months), cooks quickly due to the soft testa (1.5 hours)	Susceptible to weevils
Kabanyarwanda	Grows well in poor soils, produces good soup, endures adverse weather	Small seeds
Gantagasize	High yielding, produces good soup, cooks quickly, seeds remain whole after cooking	
Kabwejagure	Good yields on poor soils, endures adverse weather	
Yelllow long	High yielding	Not marketable: poor cooking quality, produces slimy soup, spoils overnight
Kiribwaobwejagwire	High yielding, can be stored for long periods without being attacked by weevils (four months)	Long cooking time due to the hard testa (four hours)
Kanyamunyu	High yielding, can be stored for long periods without being attacked by weevils (four months)	Long cooking time due to the hard testa (five hours)
Kakurungu	Tasty, matures early (2.5 months), cooks quickly due to the soft testa (1.5 hours)	Susceptible to weevils
Kanyebwa	Tasty, matures early (2.5 months), cooks quickly due to the soft testa (1.5 hours)	Susceptible to weevils
Kayinja	Tasty, matures early (2.5 months), cooks quickly due to the soft testa (1.5 hours)	Susceptible to weevils
Mahega short	Matures early (2.5 months)	
Kahura short	Matures early (2.5 months)	
Kahura long	Can be stored for long periods without being attacked by weevils (four months)	Long cooking time due to the hard testa

Table 30.2 Ten most preferred varieties from the gene bank and their characteristics as ranked by farmers (5 highest rank, 1 lowest)

Variety	*Type*	*Marketability*	*Taste*	*Cooking time*	*Early maturity*	*Pest resistance*	*Endurance in heavy rainfall*	*Drought tolerance*	*General acceptability*	*Total score*
Kahura	Landrace	5	5	4	4	3	3	3	5	32
Kaki short	Landrace	5	5	4	3	4	3	3	5	32
Kanyebwa	Landrace	5	5	5	4	3	2	3	5	32
Yellow short	Landrace	5	5	4	5	2	3	3	5	32
Kankulyembarukye purple	Landrace	5	5	3	3	3	3	4	5	31
Katosire	Landrace	5	5	3	3	5	2	3	5	31
Nabe 14	Modern	5	5	3	3	3	3	3	5	30
Kabwejagure	Landrace	5	5	4	2	3	2	3	5	29
Kanyamunyu, long and short	Landrace	3	4	1	4	5	4	4	3	28

Through a series of training sessions, farmers learned about the life cycle of bean weevils and now endeavour to time the harvest and dry the seeds to minimize damage before they are treated and stored in the gene bank.

Initially, the gene bank operated smoothly, with the volume of seed increasing steadily every season. However, in July 2012, the pattern of rainfall and sunshine began to change and affected the growth of beans. Some varieties died out completely. For others, the total harvest amounted to about 10 per cent less than the amount sowed (Figure 30.1). This occurred at the Kabwohe, Nakaseke and Kabale sites as well as at the national gene bank at the Plant Genetic Resources Centre in Entebbe. From the initial 49 varieties, the gene bank's capital dwindled to only 35. Fourteen varieties did not survive the 2012 planting season, possibly because they were unable to adapt to the changes in the weather.

Among the 14 varieties that did not survive were the climbing beans that had been brought from the Rubaya site, a different agro-ecological environment with a higher elevation. Their loss might have been partly due to the fact that Kiziba farmers do not like climbing beans, as they must be staked and this is seen as an extra burden in terms of both labour and funds to buy stakes. The gene bank management committee is monitoring and documenting the situation to establish the real cause of the disappearance. Farmers have expressed

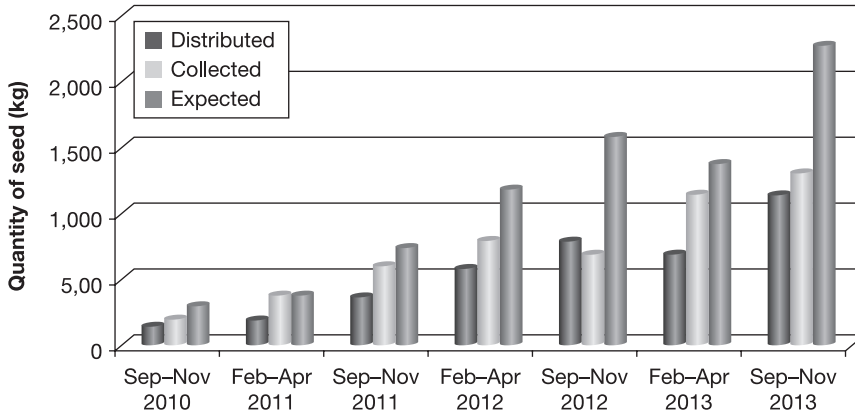

Figure 30.1 Quantities of seed distributed and collected by season since the gene bank was established

concerns about weather vagaries, especially long droughts and short rainy seasons, and how this will affect their community gene bank. Irrigation would help, but is too expensive for the majority of farmers in this area.

Operations

The gene bank is governed by bylaws developed by the Kiziba beneficiary community. It is staffed by a management committee composed of the gene bank manager, records manager, distribution manager, quality assurance manager and four 'mobilizers'. The management committee operates on a voluntary basis, which may be limiting in terms of motivation, particularly with the increased workload resulting from the steady increase in seed turnover. The manager is in charge of overall functioning of the gene bank; the records manager keeps the records; the quality assurance manager ensures that good-quality seed is brought, preserved and stored; and the distribution manager is in charge of distributing seed. The mobilizers are responsible for ensuring that farmers get seed from the gene bank and repay a portion of their harvest. Farmers not only have access to a diversity of common bean varieties, but they also benefit from training carried out by the committee with support from the National Agriculture Research Organization and Bioversity International. Among other agronomic practices, farmers learn how to produce good-quality seed and how to handle seeds after harvest.

After distributing seeds at the beginning of each planting season, members of the management committee, led by the quality assurance manager, monitor farms to ensure that the recommended agronomic practices are followed. Farmers must adhere to these practices; however, some are unwilling to do so, while others fail to harvest enough seeds to return to the bank because of poor soil and bad weather. In a few cases, seeds have been rejected by the management committee because they were of poor quality. Sorting seed is a

responsibility of the farmers and the distribution manager, who then records the amount of seed returned; the gene bank will only accept clean seeds.

The management committee ensures that seed deposited in the gene bank is stored properly and preserved using locally made organic materials, mainly cow dung, which is burned and ground to powder before being applied to the bean seeds at a rate of 25g per kilogram of beans. Because the effectiveness and shelf life of this preservation technique was not known, the management committee was prompted to work with the Plant Genetic Resources Centre and Bioversity International to investigate how it works. The committee has expressed interest in receiving more information about seed preservation and storage.

Governance

The gene bank is currently functioning as a community-level initiative managed by members of the community with technical oversight and guidance from Bioversity International and the Plant Genetic Resources Centre. Members of the gene bank management committee are appointed by general consensus of community members at their annual general meeting and serve for a two-year renewable term. The parish chief presides over the election of the committee. The general meeting is held at the end of a planting season, after harvest and return of seeds to the gene bank, to let all farmers know how much seed has been returned to the gene bank and to agree on the quantity to be given out the following season. Farmers apply for seed through the mobilizers two months before planting time and the beneficiaries are approved by the management committee. The quantity distributed depends on quantity returned.

Costs for establishment

Construction of the gene bank cost US$4,633, and furnishing it cost US$612. Another US$3,312 was needed to cover the costs of the meetings that initiated the idea and brought it to reality, to train farmers in how to run the gene bank and for capacity building. These funds were provided by Bioversity International through the National Agriculture Research Organization with support from the United Nations Environment Programme's Global Environment Facility and the Swiss Development Corporation. Operation of the gene bank is still on a voluntary basis, but discussions are underway to see how a business arm can be established to generate income from the sale of some of the seeds and still maintain the original idea of supplying free seed to small-scale farmers.

Links and networking

This initiative has come a long way and is now attracting attention in neighbouring districts. The National Agricultural Advisory Services have asked the Kiziba group to supply seeds to the surrounding areas of Buhweju and Mitoma and to help other farmer groups set up similar facilities elsewhere

in the region. This presents an opportunity for collaboration, although it is also a challenge, as the quantity of seed produced at the moment is not sufficient to satisfy the demand in Kiziba. The group has discussed the need to work on a sound strategy for increasing seed production without sacrificing quality. They are expecting to receive more technical support during a transition to a medium-scale business operation, while maintaining the free seed service for small-scale farmers. The group wishes to strengthen its capacity for business planning and management, financial management and marketing strategies, among other functions.

The farmers have had discussions with officials from the Integrated Seed Sector Development Programme, an organization that develops commercially sustainable local seed businesses and explores possibilities for collaboration. In recognition of what the gene bank is doing, its manager was elected to represent the Sheema district in the Uganda southwestern region multistakeholder seed platform. The community gene bank staff work closely with the national gene bank in Entebbe, with the Plant Genetic Resources Centre providing technical guidance. The centre keeps duplicate accessions of the Kiziba varieties as well as linking the gene bank with international support, such as that received from Bioversity International. In a bid to create visibility and more opportunities for collaboration, the Kiziba community gene bank group has also started participating in functions, such as exhibitions on International World Food Day and at diversity fairs.

Policy and legal environment

The gene bank is registered at the district level as a seed-producing group and operates under various policies, but the draft national agricultural seed policy (2011) that is currently being reviewed will be the major policy influencing its operation. The seed policy defines the modalities by which the seed industry should be regulated and the roles of various players in the industry, including farmers. The Seed and Plant Act (2006) is the legal framework that provides for the promotion, regulation and control of plant breeding and variety release, seed multiplication and marketing, seed import and export and quality assurance of seeds and planting materials. The Seed and Plant Regulations (2009) provide guidelines for enforcement of the act. The International Treaty on Plant Genetic Resources for Food and Agriculture and the Multilateral System also stipulate ways in which the gene bank can be linked to the international system of access and benefit sharing. The members of the Kiziba community gene bank have expressed enthusiasm about collaborating and benefitting from connections with other parts of the world.

Achievements

The gene bank started with 100kg of seed, but, in three years, it has distributed over 3,000kg of good-quality common bean seed. Its coverage has also

expanded: from fewer than 100 farmers in 2010 to 280 farmers in 2013 and the demand for seed surpasses the supply of some varieties.

The member farmers have also benefitted from a number of capacity-building initiatives, including training in general bean production, postharvest handling, sorting, preservation and pest and disease control. They have also started learning about business management in a bid to expand the gene bank and become an enterprise.

The group has shared knowledge, information and experience with farmer groups involved in seed activities elsewhere: for example, the Kakindu Farmers' Association from Mityana, Uganda, and the Kusinduka Farmers' Cooperative from Rubaya, Rwanda. In addition, their awareness of issues surrounding the International Treaty on Plant Genetic Resources for Food and Agriculture has increased and they have learned how they can exchange germplasm with farmers operating community gene banks in other countries.

Sustainability and prospects

The gene bank can be sustainable if it becomes a profit-making enterprise. For example, the farmers are looking to raise funds from the sale of seeds and by teaching other groups who want to engage in seed production in the same manner. Links with other organizations may provide more opportunities for the gene bank to evolve further. Exposure to the Multilateral System is also an opportunity for the gene bank to collaborate with other countries, increase crop diversity and receive technical and financial support.