Farmers and researchers are using a subtle blend of traditional knowledge, science and business skills as they work together in the Great Lakes region of Africa to use and thus conserve some of the richest banana diversity in the world.

Reconciling modernity and tradition to conserve diversity

In Uganda, women often tend to the banana plants while the men are in charge of selling the fruits.

Florence Kizito, one of the participants and most ardent supporter of the IDRC-funded on-farm conservation project.

"There was a time when every farmer around here knew the names and the appropriate use of each of these bananas", reflects Mrs Florence Kizito, indicating her neatly-tended and labelled collection of some thirty East African highland banana cultivars, not far from Masaka town in Uganda. Every home worthy of the name had a banana garden and a man's worth as a farmer and householder was evident to friends and foes alike from the state of that garden – even though it was mainly women who kept the weeds at bay and neatly trimmed off the dead leaves, to keep the garden looking at its best.

"Nowadays, many people only know the price of banana at the Kampala truck stop – and they grow just a few kinds that give them the best return." Florence lays the blame for the loss of highland banana diversity firmly on an official extension policy based on imported 'green revolution' thinking. "Our ancestor must have turned in his grave as he listened to the extension messages", she says, alluding to Kintu, the legendary founder of the Buganda Kingdom.

Florence grew up knowing bananas as an integral part of her Kiganda culture (*see A banana for every occasion*), as well as the dominant element in her environment. She

A banana for every occasion

Kintu, the ancestor said to have founded the Buganda Kingdom, reputedly came to the region with a cow and banana suckers, representing the five main types of highland banana: Nakitembe, Musakala, Nakabululu, Nfuuka and Mbidde. Besides having practical uses, such as treating gastro-intestinal ailments or malaria, tradition required that the right banana variety be used to celebrate the birth of twins or to mourn the death of loved ones – with different varieties to be used for the death of a man or of a woman.

Nakitembe, believed to be one of the oldest cultivars in the Great Lakes region of Central Africa, was a woman's cultivar from the moment of birth: immediately after she was born, the placenta had to be buried, with due ceremony, under a plant of that variety. For a boy-child, the cultivar was Nsowe and similarly his after-birth had to be buried below a clump of that banana. When the boy grew up and set out to find a woman to marry, he needed cultivar Mpologoma ('the lion') as part of bride payments. If he began to stray from hearth and home, his young wife might have employed the services of cultivar Enzinga, whose spirally arranged bunches were supposed to ensure that husbands did not wander.

Market forces that encouraged farmers to grow only a few of the most productive banana varieties for the urban market, threatened to cut whole communities adrift from their cultural roots. However, taking a broader perspective on livelihoods has helped farmers to see how they can use banana diversity to build their social capital, as well as enhance their financial and natural resources. By reasserting traditional uses of bananas, at the same time as developing new ones, farmers have been able to reinforce community cohesion and preserve traditional cultivars.

joined the modern world as a teacher, but she returned to the farm by choice, becoming a successful producer of both bananas and dairy products. Now she has turned her teaching skills to effective use, as an enthusiastic advocate of an innovative project – funded by the International Development and Research Centre of Canada (IDRC) and implemented by INIBAP – on preserving banana diversity for both cultural and economic reasons.

The challenge of the project, explains Eldad Karamura, INIBAP's regional coordinator for Eastern and Southern Africa, was to show farmers that there was no inherent conflict between preserving traditional values and achieving success in the contemporary market economy. "The farmers were being offered a stark choice: between increasing their income or preserving their cultural identity," says Eldad, himself a child of the banana culture of Uganda's fertile south-western corner. However, in long and patient consultation with communities involved in the project, in the Kagera region

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of Tanzania and the districts of Masaka and Bushenyi in Uganda, project facilitators explored all possible dimensions of the issue. Eldad again: "The problem of poverty and the need to grow only what the market could take were raised and discussed at all meetings. Were culture and modernization at war? By all means no! Could our traditional cultivars really meet our cultural obligations and our income challenges at the same time? That's the hypothesis the project set out to test."

Farmers in Uganda have to make do with an ever-diminishing land base.

Tailor-made solutions

Exploring together a whole range of social and biophysical aspects of the situation, farmers and researchers discovered that they can enhance both the cultural and economic value of cultivar diversity and, in the process, help to reverse the erosion of the region's fragile natural resource base too. Demographic pressure, especially the challenge of supporting growing families on ever-diminishing plots of land, is an underlying issue throughout the project area. The Great Lakes region in the heart of Africa supports some of the densest rural populations in the continent, with figures of over 500 persons per square kilometre recorded in some areas. Pressure on the natural resource base is correspondingly intense.

"The farmers were being offered a stark choice: between increasing their income or preserving their cultural identity"

Communities chose collectively to focus on different aspects of the problem or on pursuing different kinds of solutions. Benchmark sites, representative of each area, were chosen as test beds for new technologies and

Do you need a cow to be a successful banana farmer?

As the legend of Kintu applies, the people of south-western Uganda were traditionally both cattle-herders and banana growers. Those who were serious about cattle used to breed long-horned Ankole cattle – and indeed, the look of the cows and the exact form of their horns still seems to be a matter of great pride for the breeders. But as the pressure on land increases, farmers are developing new skills in integrating livestock rearing more closely with banana growing. Instead of herding the cows extensively, to make use of both pasture and crop residues, farmers are keeping cows under 'zero-grazing' regimes: the cow (or, for modest establishments, a goat) is kept in a stall, for at least the greater part of the time, and forage is brought to the animal.

This implies a great deal of work. For a cow to be productive, especially to produce high-value dairy products, it needs both considerable quantities of plant matter but also water. Many farmers, however, are finding that the investment of labour pays off. Some of the greatest gains can be made if a farmer can afford the additional investment in a sloping concrete floor for the cattle pen. Farmers and researchers are finding that the urine collected from the cattle provides greater benefits to soil fertility than the manure. And there is even the suggestion that the urine repels banana weevils too. To make the most of zero-grazing, however, the farmer must also pay attention to the genetics of the cows: crosses between traditional breeds and more productive specialist dairy cattle are needed, in order to maintain disease resistance while repaying the investment of labour with more milk. If there is any sign of strife among members of the Bushenyi farmers association, it is because the demand for dairy cows outstrips the current supply.

Lack of space has forced farmers to keep cows in stalls and bring them forage, in this case chopped up banana pseudostem.

approaches that might contribute to the solution of each problem or set of problems identified. The project offered a flexible approach to identifying similarities and differences between the situations of participating communities, learning from them and even capitalising on them through exchanges and training.

In Bushenyi, in southwestern Uganda, declining soil fertility, coupled with banana weevil attack, were singled out for attention. In this mountainous benchmark site, some farmers specialized in testing and demonstrating soil erosion control measures; other farmers focused on preparing manure from crop residues, weeds and domestic animal waste. The effort to integrate livestock was boosted by linking-up with a USAID-funded ECOTRUST project that provided cows, which in turn provided manure to fertilize the fields (see *Do you need a cow to be a successful banana farmer?*).

In Lwengo Masaka, in more gently rolling terrain, nearer to Uganda's capital, Kampala, the key specialization was innovative marketing that addressed the problem of making use of the cultivars with small bunches – typically rejected by the traders. This was approached through the packaging and sale of banana fingers instead of whole bunches. In urban markets this broadened the market to include those people who needed only a few fruit and not an entire bunch.

Across the border in Tanzania, farmers in Ibwera, close to Lake Victoria, identified weevil attack as their overriding problem. Weevils not only decimated their traditional cultivars but also greatly diminished their production of plantain for the street food market in Bukoba town. Meanwhile farmers in Chanika, the most remote of the four project sites, had to address the problem of post-harvest losses. As there were no nearby markets for fresh fruit, they evaluated strategies for ensuring a longer marketable life and higher value for their fruit, including solar drying banana figs and making wine.

For those farmers who cannot afford a cow, a goat or a sheep will do just as well (below). An East African highland banana of the Musakala type (right).

> *"The same plant grown under different conditions may show quite different characteristics, and these characteristics may also change over time"*

Rediscovering diversity

Underpinning the search for solutions to production and marketing problems, and to some extent running in parallel with it, was the quest to understand and harness the region's rich diversity of banana varieties. Nobody knows exactly how bananas first arrived in Africa nor exactly how many kinds there are. Highland bananas are derived from the *acuminata* bananas of South-East Asia and, like the dessert banana of international trade, they are triploids. However, these bananas have evidently been in East and Central Africa a very long time – long enough for numerous mutations to

accumulate and for this region to become what taxonomists describe as a secondary centre of diversity for bananas, encompassing perhaps 10% of the world's known banana cultivars.

As mutations created new cultivars and as useful ones were exchanged between communities, they were given numerous names, some used generally throughout the region, others in just a few communities. The person charged with sorting out this biological and social complexity is Deborah Karamura, perhaps the world's leading expert on highland bananas. "The

assembling the various cultivars in village 'genebanks' in each of the project communities, where they can be compared growing side by side, by researchers and farmers alike. Local names and detailed characteristics are carefully compared and synonymies are established. When distinctions are still unclear, the molecular biologists at Makerere University in Kampala are called in to analyse the DNA 'fingerprint' of the cultivars, an analysis that also helps to show how the cultivars are related to one another.

In the process of sorting out the taxonomy, various

Farmers from Masaka discussing strategies to conserve their unique set of banana cultivars.

'plasticity' of these cultivars presents us with a special challenge," she explains. "The same plant grown in different places, under different conditions, may show quite different characteristics, and these characteristics may also change over time."
The project has sorted out many of these distinctions by

traditional cultivars, feared lost in one community, were rediscovered growing not far away in another. Community members exchanged planting material and information about traditional and contemporary uses for each cultivar, in the process exchanging not only the genetic resources, but also the knowledge that will help to ensure their survival.

Finding markets for diversity

Since the beginning of the project in 1999, the number of participating farmers has grown from 30 to 40 at each site to 200 to 500, each organized into a community-based producers' association. However, enthusiasm for traditional banana diversity was not enough to sustain the effort over the long term. The associations needed group- and financial-management skills, better links to markets and more options for processing their bananas, and thus adding value to the diversity they had so painstakingly restored.

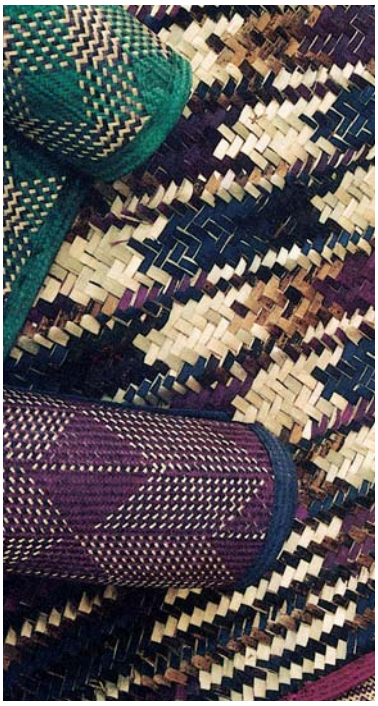
Some East African highland banana cultivars are peeled and put in a "banana boat" to make a beer rich in vitamin B.

During 2004 all the participating community associations have been busy, accessing and learning the different arts and trades that can add value to their diverse banana cultivars and broaden utilization. Handicrafts such as basket-weaving make the most of cultivar diversity because the different colour shades of banana fibre, available in different cultivars, enliven the elaborate patterns and textures of the baskets. The handicraft groups around Masaka, formed by women in the banana-producing communities, have made considerable progress in linking up with the tourist industry in Kampala and other urban centres; souvenir shops are already selling banana fibre-based handicrafts and the women have proven adept at adapting and adopting designs to respond to market opportunities.

The Bisheshe community in Chanika has taken the lead in wine making and has sent trainers to both Masaka and Bushenyi to help develop wine making skills in these communities. In much of Uganda, more recently introduced 'beer bananas' are used as the raw material for all juice-based products. In the project area, however, farmers are rediscovering the virtues of their own high-juice highland cultivars – even if other cultivars can be pressed (and fermented!) into service when they are available in abundance. Efforts are now under way to persuade the national bureaux of standards of Uganda and Tanzania to establish the standards that will pave the way for quality control and wider marketing. Speciality paper-making offers another route for turning by-products and local labour into high-value products.

The road ahead is not without its share of potholes, speed-bumps and check-points. One major concern remains the long-term maintenance of soil fertility, as more bananas and by-products are taken away to urban markets, instead of being consumed on site and the residues re-cycled onto the banana plots. Even under traditional management, farmers often brought residues from other crops to boost the fertility of their banana plots. So far, Ugandan farmers are not, in general, re-investing their new profits from bananas in mineral fertilizers to replenish the nutrients lost from the farms. The project's philosophy, however, is that when farmers are making a reasonable profit from the banana plots, they will have a strong incentive to invest in the future of those plots. And there are some signs that this is already happening. As you travel around the project area, you can often identify the active members of the growers' association, not just from the new corrugated iron roofs on their houses, but also from the greener, stronger banana plants. Perhaps the tradition of judging the skill of a farmer by the state of his – or her – banana plot is being reasserted. And now, with the new spirit and philosophy of the growers' association, there is every prospect that the skills necessary to sustain the gains will spread throughout the community. ■

The women have proven adept at adapting and adopting designs to respond to market opportunities



Women from Masaka use banana fibre to make mats (above) and baskets (right) that are sold in Kampala and other cities.