



**NEIGHBORS
HELPING NEIGHBORS:
A STRATEGY FOR
SUB-SAHARAN AFRICA**



FOR TWO DECADES, MANY
OF AFRICA'S LEADING ROOT
AND TUBER CROP SCIENTISTS
HAVE WORKED TOGETHER
THROUGH A NETWORK
CONSIDERED TO BE ONE OF
THE DEVELOPING WORLD'S
MOST SUCCESSFUL RESEARCH
AND DEVELOPMENT
PROGRAMS

In 1988, in an emergency effort to restart Uganda's national potato program, scientists working in Rwanda under the umbrella of PRAPACE (the French acronym for the Regional Network for the Improvement of Potatoes and Sweetpotatoes in Eastern and Southern Africa) supplied their Ugandan colleagues with 9 tons of high quality potato seed. At the time, Uganda was recovering from nearly 15 years of political upheaval that had left the country's once-thriving agriculture in disarray. Without an infusion of clean seed stocks and improved varieties, scientists feared that Ugandan potato farmers would be forced to plant deteriorated seed, all but guaranteeing poor yields and little return on investment. The effort was a success, and Uganda's potato program subsequently recovered.

Rwanda's generosity was repaid in 1994 following that country's own civil war. Weeks before the nation's farmers began returning from camps set up across the border in the Democratic Republic of the Congo, aid donors began looking for a source of high quality potato seed that could be supplied to thousands of returning refugees. Uganda's National Agricultural Research Organization—a PRAPACE member—helped avert a crisis by providing 20 tons of quality potato tubers as part of the CGIAR's Seeds of Hope Campaign. As it turned out, much of the material sent to Rwanda was derived from the emergency shipment Rwandan scientists had sent to Uganda six years before.

A GOOD-NEWS STORY

"This is the kind of good-news story that you don't hear much about in the media," says PRAPACE Coordinator Berga Lemaga, "but it's not all that unusual either. In Africa, when problems arise neighbors try to help neighbors."

Today, Rwanda produces nearly three times as many potatoes as it did 20 years ago, including large numbers of improved, CIP-derived varieties that have a broader genetic background than the potatoes grown in most industrialized countries. In Rwanda, as in much of eastern and southern Africa, potato is a basic food security crop and a major income generator for the poor. In 2001, per capita potato production equaled that of some of Europe's largest potato producing countries. German farmers, for example, produced about 11 million tons, while Rwanda—with one tenth of the population and less than 1 percent of the land—produced nearly 1 million tons.

NOT JUST POTATOES

Originally established as a potato research network, PRAPACE now covers sweetpotato as well. The network invests nearly half of its US\$400,000 annual budget in sweetpotato research and development, with highest priority directed to the distribution and testing of orange-fleshed sweetpotato varieties or OFSPs, which contain high levels of beta-carotene, used by the body to make vitamin A. "PRAPACE has been a key player in our efforts to promote OFSPs in the fight against vitamin A deficiency," says Regina Kapinga, Coordinator of the VITAA (Vitamin A for Africa) Partnership. Vitamin A deficiency is one of Africa's most widespread public health problems, and also one of its most treatable, she says. For example, a CIP study presented at a recent meeting of the International Vitamin A Consultative Group concluded that up to 50 million children under five would benefit if African farmers switched from traditional white-fleshed varieties to improved orange-fleshed sweetpotatoes.

"We have been working closely with PRAPACE to distribute orange-fleshed varieties to its member countries, and we expect that the network will play an important role in promoting a new generation of sweetpotatoes that is just now beginning to reach the region," Kapinga says. She notes that PRAPACE was an early proponent of orange-fleshed varieties, and invested significant resources to demonstrate the feasibility of using OFSPs to eliminate vitamin A deficiency among young children and their mothers. The early VITAA varieties were high beta-carotene lines selected from farmer varieties and genebank holdings.

CIP plant breeders have produced a new and improved set of OFSP materials that not only meet local market standards for taste and texture, but also can be harvested earlier—a factor that is important for pest control because it limits exposure in the field—and produce higher yields. The new plant types, which began shipping from CIP headquarters at the end of 2002, are the first to emerge from a six-year breeding program supported by the German Government's Ministry for Technical Cooperation (BMZ) and its operating arm, GTZ.

A SHARED MISSION

The PRAPACE network, which celebrated its twentieth anniversary in 2002, supports the region's farmers by providing a range of technical services through the combined efforts of the agricultural research and extension programs of its ten member countries.

PRAPACE membership is not automatic. To join, a prospective member must apply formally and then agree to commit staff and resources for research in a specific problem area. Scientists in Burundi, for example, play a lead role in integrated disease management focusing on bacterial wilt, while researchers in Uganda and Ethiopia work on varietal testing and late blight disease management. In this way, PRAPACE helps to pool resources and maximize benefits. Among its newest members, Tanzania joined in 1998 followed by Madagascar and Sudan in 1999.

"We estimate that the value of the services provided by PRAPACE members now totals more than US\$1.0 million annually, roughly four times the amount provided by our international sponsors," Lemaga says. PRAPACE receives its principal funding from the United States Agency for International Development (USAID), with complementary grants from Canada's International Development Research Center (IDRC) and the United Nations Food and Agriculture Organization (FAO). The network is governed by a steering committee composed of the leaders of the national potato and sweetpotato research programs of its member countries. CIP is the project's executing agency and provides technical backstopping.

ASARECA: A STRENGTHENING ASSOCIATION

While PRAPACE's overarching mission is to promote root and tuber research and development among its members, the network members are particularly proud of their success in supporting linkages and communication between a range of different organizations. Such linkages are particularly important, Lemaga notes, as the world globalizes and as the region's environmental problems become more challenging. "No one nation or group of nations can go it alone and be successful," he says.

PRAPACE partner agencies currently include four Future Harvest Centers—CIAT, CIP, ICRAF, and IITA—and FAO, IDRC, and two dozen bilateral agencies and nongovernmental organizations. Its most important relationship, however, is with ASARECA, the Association for Strengthening Agricultural Research in Eastern and Central Africa. PRAPACE operates under the auspices of ASARECA and is one of its twelve commodity research and development networks.



ORIGINALLY ESTABLISHED AS A POTATO NETWORK, PRAPACE NOW DEDICATES ABOUT HALF OF ITS BUDGET TO SWEETPOTATO, IN PARTICULAR TO THE NEW ORANGE-FLESHED VARIETIES BEING PROMOTED BY THE VITAA PARTNERSHIP (BOTTOM).

ASARECA, established in 1993, is a regional coordinating body set up to improve the quality and cost-effectiveness of agricultural research, support regional collaboration, and improve information and technology delivery. It is considered one of Africa's most important research partnerships and an essential mechanism for agricultural development in the region.

Former USAID project officer Carole Levin says that her agency's decision to invest in ASARECA was originally linked to PRAPACE's early success and to its Directors Committee's willingness to lobby for a regional organization that would work with crops other than potatoes and sweetpotatoes. "The PRAPACE Steering Committee laid much of the ground work for ASARECA by demonstrating the value of regional cooperation and the benefits of pooling national resources," she says.

"We are extremely proud of our early links and our ongoing association with PRAPACE," adds ASARECA Director Seyfu Ketama. "PRAPACE is an example of what can be achieved when countries and international organizations work together to collectively and equitably promote regional economic growth through agriculture."

"PRAPACE is also an important part of our efforts to promote long-term sustainability of our natural resources," he says. "Maintaining the land and the water is not a foreign concept, it is very much in keeping with traditional African culture and traditions. Through PRAPACE and ASARECA we are working together to achieve a greater good by combining our traditions with science that serves the public's greater interest. We congratulate PRAPACE and all of its members on its twentieth anniversary."

CIP research in sub-Saharan Africa is broadly supported by the CGIAR donor community through nonrestricted funding and, in particular, by restricted projects financed by Germany and the United States. Other important donors include IDRC, the McKnight Foundation, and the UK's Department for International Development, which support research and development in the areas of postharvest utilization, peri-urban agriculture, and genetic conservation.



SINCE ITS FOUNDING 20 YEARS AGO, PRAPACE HAS HELPED TO STRENGTHEN NETWORKING FOR ROOT AND TUBER CROP DEVELOPMENT IN AFRICA.

PRAPACE MEMBER ORGANIZATIONS

Burundi	Institut des Sciences Agronomiques du Burundi (ISABU)
DR Congo	Institut National d'Etudes et de Recherches Agronomiques (INERA)
Ethiopia	Ethiopian Agricultural Research Organization (EARO)
Eritrea	Department of Agricultural Research and Extension of the Ministry of Agriculture and Extension (DRE)
Kenya	Kenya Agricultural Research Institute (KARI)
Madagascar	Centre National de la Recherche Appliquée au Développement Rural (FOFIFA/FIFAMANOR)
Rwanda	Institut des Sciences Agronomiques du Rwanda (ISAR)
Sudan	Agricultural Research Centre (ARC), Khartoum Tanzania Uyole Agricultural Research and Training Institute (UARTI)
Uganda	National Agricultural Research Organization (NARO)

DETECTING VIRUS DISEASES

CIP has used enzyme-linked immunosorbent assay (ELISA) and nucleic acid spot hybridization (NASH) techniques to develop highly effective detection kits that are relied upon by PRAPACE seed producers and tissue culture laboratories to detect virus-infected seed tubers. The simple-to-use kits can detect, with high sensitivity and accuracy, the world's four leading potato viruses and the viroid PSTVd, which are transmitted by aphids and mechanically during tuber handling. Because African potato farmers use very little insecticide, and because there are few sources of genetic resistance to viruses available, control depends on eliminating infected seed before it reaches farmers' fields. The kits give seed producers the ability to detect viruses at high levels of efficiency, rivaling the standards obtained in sophisticated laboratories in developed countries.



A QUESTION OF SEED

Ask any African potato or sweetpotato farmer what they want most and their response will be "high quality seed." The better the seed, the greater the return on investment. Farmers who use superior quality seed can easily double or triple production.

Since its inception, PRAPACE has invested heavily in rural seed production projects in an effort to move improved varieties to where they are needed most. In 2002, more than 1.2 million farmers working through hundreds of nongovernmental and community-based organizations participated in PRAPACE seed programs.

- In Rwanda, 240 local seed associations distributed nearly 18,000 tons of superior quality potato tubers, almost doubling the amount distributed in 2001.
- In Burundi, government agriculturalists set rehabilitation of the country's national potato seed program as priority for the period 2002–2004. Burundi's goal is to produce 10,000 tons of high quality tubers by the end of 2004 using CIP/PRAPACE-released varieties.
- In support of that effort, government and private sector laboratories are producing large quantities of "basic seed," a product that is virtually pest- and disease-free. Basic seed, the highest quality seed, is normally provided in small quantities to top seed producers to produce seed for the market.
- In Ethiopia, the national potato program—a PRAPACE affiliate—established its first modern tissue culture laboratory. The new lab, which is multiplying four potato varieties for the Ethiopian highlands, has the capacity to produce up to 1 million ultra-high quality plants per year.
- To jump start potato breeding and development efforts in Sudan and Tanzania PRAPACE, in cooperation with CIP, provided researchers in those countries with a series of new breeding lines that have proven successful elsewhere in the region. The objective is to develop varieties that are well suited to local conditions in the shortest possible time and at limited expense.

AFRICA AND THE PRIVATE SECTOR

Economists and development experts agree that one of the best ways to promote rural development in sub-Saharan Africa is for farm enterprises to tap into local and international markets. For African farmers to take advantage of market opportunities, however, they will need to produce higher quality products that are delivered on time and in sufficient quantity. To link farmers and markets, PRAPACE encourages participatory research involving community-based organizations, the private sector, and national research and development programs.

- In 2002, investments in postharvest research by PRAPACE and Uganda's National Agricultural Research Organization led to the release of a highly nutritious porridge by the Maganjo Millers, a local food processor. The new high-protein, high-beta-carotene product, known as Nutri-Porridge, is made from a combination of orange-fleshed sweetpotato, maize, and groundnuts. It is reportedly outselling all of its competitors on the Kampala market and is already in short supply.
- A partnership established with the Uganda-based House of Quality Spices has opened up new opportunities for local farmers to export potato and sweetpotato flour to Europe. The company also plans to produce snack foods for sale to neighboring countries including Rwanda, where its products received high marks from the nation's President, Paul Kagame, after he performed a taste test.
- A Rwandan company, Potato Enterprises, recently announced that it would commence commercial chipping operations in 2003 using CIP potato varieties released through PRAPACE. The firm's long-term strategy calls for the manufacture of nearly 5,000 tons of chipped potatoes during its first year of operations, with a ten-year goal of 15,000 tons. Seventy-five percent of its output is slated for export.
- More than 20 Kenyan companies are currently involved in production of frozen potatoes and snack foods for the domestic market. One food processor, Mugumo Family Farms, produces 1.2 tons of processed products per week, mainly for the hotel and airline industries. Farmers who sell their potatoes to Mugumo receive twice the going price for their products.
- Researchers working for the commercial feed companies UGACHICK and NUVITA in Uganda are conducting studies to determine the feasibility of using sweetpotato as a principal ingredient in commercial animal feeds. If successful, their products will be sold in Burundi, the Democratic Republic of Congo, Rwanda, Tanzania, and Uganda. Processors are attracted to sweetpotato because of the productive potential of improved varieties and because of their early maturity, which helps farmers produce up to three crops per year. Many of the new varieties are also high in beta-carotene, an important ingredient in poultry feed.
- As Ugandan sweetpotato production reaches record levels, Maganjo Millers in Kampala has agreed to purchase all of the orange-fleshed sweetpotato produced by farmers in Uganda's Soroti and Kumi districts. The agreement is expected to remove a marketing bottleneck that has limited the crop's potential.
- Western Kenyan community-based organizations in three districts are involved in producing and marketing weaning foods that contain orange-fleshed sweetpotato. The NGO Appropriate Rural Development Agricultural Program, for example, works with local processors to supply charity homes and midwives with a product, attractively packaged in 1 kg packets, that they use to improve the health of their clients.