

Kenya

The Centers of the CGIAR, working with the strong network of public sector and civil society partners, have helped advance agricultural development in Kenya. Most of the CGIAR Centers operate research programs in the country.

New varieties of beans give higher yields

Farmers in western Kenya have adopted new varieties of beans that resist root rots and produce yields more than double those of the commonly grown local varieties susceptible to such diseases. In response to a root rot crisis, CIAT and the Kenya Agricultural Research Institute (KARI) worked with the extension service of the Ministry of Agriculture (MoA) to introduce 27 improved bean varieties. In a complementary participatory research project, local farmers selected 11 of those varieties as the best. Seed from the chosen germplasm was multiplied and distributed via women's groups, government extensionists, and an NGO. A recent impact study shows one of the new bush beans was being grown by 80 percent of farmers surveyed in one district and by 42 percent in another.

Two other varieties had smaller adoption rates in both districts. The rate of adoption was highest in Vihiga Districts, which is one of Africa's most densely populated regions, with 850 persons per square kilometer.

Building forest-related research capacity

CIFOR has conducted three regional studies of forest-related capacity in Africa. In 2001/2 CIFOR initiated a collaborative research initiative with the Kenya Forestry Research Institute (KEFRI). The FAO-supported study assessed the research capacity of 47 organizations in several East African countries, including Kenya. Country representatives from the region participated in a training workshop hosted by KEFRI in July 2001. Participants learned study methods from CIFOR scientists before returning home to apply them in assessing their national research systems. In January 2002 KEFRI and CIFOR organized the data analysis and writing workshop at Makerere University, Uganda, where findings were shared and the capacity information was analyzed. The final report is in press and, like earlier studies, is expected to influence investor funding for building research capacity in the region.

Protecting maize from pests

"Without maize, there is no food." The Kenyan saying reflects the hard reality of life for the country's smallholder subsistence farmers. CIMMYT and KARI have collaborated to increase maize harvests through technologies that cut losses due to pests - specifically, stem borers and the parasitic weed striga. The Insect-Resistant Maize for Africa (IRMA) project brings KARI and CIMMYT researchers from diverse disciplines together to develop maize that is resistant to stem borers, which inflict yield losses of 15 percent annually (estimated value of losses US\$72 million). Conventional breeding and genetic engineering are used to produce varieties that are better adapted to Kenya's diverse agroecological zones. The two institutes also teamed up with the Weizmann Institute to develop a novel, but simple, seed treatment method that protects maize from striga, which infests more than 75 percent of the farmland in Western Kenya, causing an estimated US\$1 billion in crop losses.

Developing a taste for sweet potatoes

Over the past seven years, over 70 partners have worked together under the umbrella of the Vitamin A for Africa (VITAA) initiative to fight vitamin A deficiency in Kenya. Among them, CIP, KARI, and the Rural Energy and Food Security Organization (REFSO), an NGO based near Lake Victoria, have teamed up to introduce orange-fleshed sweet potato in four Kenyan districts with the highest rates of vitamin A deficiency. CIP begins by breeding improved varieties of sweet potatoes to meet African consumer requirements while providing good levels of beta-carotene. The Center forwards these to KARI, whose Kakamega station provides a continuous supply of basic materials to REFSO. REFSO then organizes the production and distribution of vines and tips (sweet potato is planted using vine cuttings) to strategically placed farm families for testing and promotion. CIP works closely with KARI and REFSO to ensure quality control of the vine production. Over 3 million vine cuttings have been distributed to some 200 farm families, who in turn have passed the material on to their neighbors, promoting better nutrition for thousands of rural people.

Improvements in crops and soil water use

Kenya cooperates with ICARDA in malting and forage barley improvement through its National Plant Breeding Research Center (NPBRC), based in Njoro. ICARDA recently supplied a special collection of 42 elite lines to NPBRC for use in the Kenyan barley improvement program, and eight barley nurseries were provided to select lines suitable for cultivation in Kenya. ICARDA has also been involved in the improvement of food and forage legumes (chickpea, dry pea, lathyrus, and vetch crops) for Kenyan agriculture. In cooperation with KARI, Moi University, and Kenya's National Dryland Farming Research Center, ICARDA has been undertaking crop improvement research and providing improved germplasm to Kenya.

Helping farmers meet market demand

ICRISAT is involved in an innovative system to ensure that farmers in semi-arid areas can benefit from market opportunities. Considering more than 70 percent of Kenya is semi-arid, this is without question a significant initiative. The focus is on grain legumes because of the strong domestic, regional, and international demand for

these foods. To do this, ICRISAT works with a range of development partners: Catholic Relief Services (CRS), to organize farmers into production marketing groups; private sector partners such as the Kenya Agricultural Commodity Exchange (KACE); to provide market information and to facilitate trading; and TechnoServe, an organization with expertise in enterprise development, to develop a strong and vibrant private sector. On this science and technology front, ICRISAT works with KARI to ensure that farmers have the right varieties to meet market demand, and that they can increase productivity.

Research projects to improve food security

Kenya is one of six countries participating in IFPRI's Network for East Africa, an innovative effort to reduce poverty and improve food security in the region using three main tools: collaborative research, strengthened capacity for food policy research and analysis, and improved communication of policy research. The network is guided by a regional advisory committee. Kenya has been an important focus of the network's research projects on rural services and agricultural markets, as well as its capacity-strengthening activities such as a competitive research grants program and proposal-writing workshops. The network's publications include a report on ways of improving delivery of animal health services for Kenyan farms. Kenya is also participating in an IFPRI-facilitated effort to design a collaborative masters program in agricultural and applied economics in East and Southern Africa.

Averting a crop disaster in western Kenya

When the devastating pandemic of the virulent Uganda variant of cassava mosaic disease (CMD) spread from Uganda to western Kenya, yield losses were so great that farmers started to abandon cassava cultivation. Six years ago IITA teamed up with KARI to tackle the problem. IITA, using its experience in fighting the pandemic in Uganda, provided diagnostic tools and CMD-resistant germplasm from its collection and was able to move the material quickly into western Kenya (working in conjunction with the Kenya Plant Health Inspectorate Service). As a result of the rapid multiplication and distribution of the new cassava, with the assistance of participating farmers and NGOs, production has returned to prepandemic levels and next year the harvest is expected to be even larger. The project is a fine example of the longstanding cooperation between IITA and Kenya's agricultural research system for achieving development impact.

Smallholder dairy marketing for nourishment and income

ILRI was founded in Kenya in 1972. Among ILRI's closest Kenyan partners are KARI, MoA, and the Ministry of Livestock and Fisheries Development (MoLFD). Among their current collaborative projects are an award-winning Smallholder Dairy Project that is helping subsistence farmers market their products. Other Kenya-ILRI collaborative projects are helping highland farmers integrate livestock and crops for higher yields and better soils, determining the severity of droughts in the Horn of Africa, developing new diagnostics and vaccines against East Coast fever and trypanosomosis, and assessing development trade-offs in Kenya's wildlife-rich rangelands. Fifteen years of research by KARI, MoA, MoLFD, the Kenya Dairy Board, and ILRI has supported the ongoing boom in Kenya's smallholder dairy production, which - contributing up to 80 percent of the milk marketed in Kenya - has proved one of the most effective ways for poor Kenyans to nourish their children while generating incomes and jobs.

Strengthening the vegetable genebank

African leafy vegetables are important for food security, nutrition, and poverty alleviation throughout sub-Saharan Africa. They are adapted to local conditions and add to the genetic richness of home gardens. IPGRI's regional office in Nairobi has worked with local partners, including KARI, through the National Genebank of Kenya (NGBK) to increase understanding of the role of African leafy vegetables in production systems. IPGRI and NGBK have conducted surveys of 14 priority species. More than 1,000 accessions are currently documented and conserved in the genebank. Together with farmers, NGBK is characterizing six key species, which will be followed by participatory varietal selection and bulking of seed. A major outcome has been the discovery of two new species within the *Solanum nigrum* complex. One of these has exceptional characteristics: it is not bitter and therefore has great market potential.

Controlling malaria in Kenya

As part of the Systemwide Initiative on Malaria and Agriculture (SIMA), collaborative research by IWMI and the International Centre of Insect Physiology and Ecology (ICIPE) in the Mwea irrigation scheme in Kenya has helped identify opportunities for improving the health and economic well-being of communities in rice irrigation schemes. Water management practices were researched for their potential to reduce malaria and other health risks - in particular the wet/dry irrigation method that involves the intermittent drying of rice fields. This method is effective as a means of saving water and killing off mosquito larvae. Farmer cooperatives have expressed interest in this method of boosting rice production under conditions of increasing water scarcity. Because malnutrition lowers people's immunity to disease, researchers also assessed the mixed crop and livestock production systems of the Mwea scheme to help improve household nutrition and income generation.

Agroforestry and conservation go hand in hand

The World Agroforestry Centre was founded in Kenya 25 years ago as ICRAF (International Centre for Research

in Agroforestry). Close partnerships with Kenya' two principal national agricultural research institutions - KARI and KEFRI - have been vital to the success of its work and the impact it has had on Kenyan farmers. The foundations for the science of agroforestry were laid in Kenya and expanded through the Machakos field station set up in 1981. From there were developed improved fallows of leguminous trees to restore the fertility of degraded soils and increase crops yields and the incomes of small holders. These practices are now being used by tens of thousands of Kenyan farmers. In partnership with national and international institutions, the Center also introduced the use of fodder shrubs as low-cost dairy feed options. Mixed agroforestry systems developed around the periphery of the Mount Kenya World Heritage Site are providing poor people with alternative sources of timber and income . Agroforestry is also helping to restore the health of the Lake Victoria watershed.

Fostering the development of aquaculture in Africa

In 2002 Kenya hosted a groundbreaking meeting on the impacts of using genetically improved and alien species on aquaculture in Africa. Convened in Nairobi with the support of the WorldFish Center, the Technical Center for Agricultural and Rural Cooperation (CTA), the World Conservation Union, FAO, UNEP and the Convention on Biological Diversity (CGD), the workshop brought together over 40 aquaculturists, geneticists, and conservation specialists to develop guidelines that will foster the development of aquaculture in Africa while maintaining the continent's aquatic biodiversity. The meeting issued the Nairobi Declaration on Conservation of Aquatic Biodiversity and Use of Genetically Improved and Alien Species for Aquaculture in Africa.

Source: *Voices from the Field: Science for the poor in Kenya. 2003.*