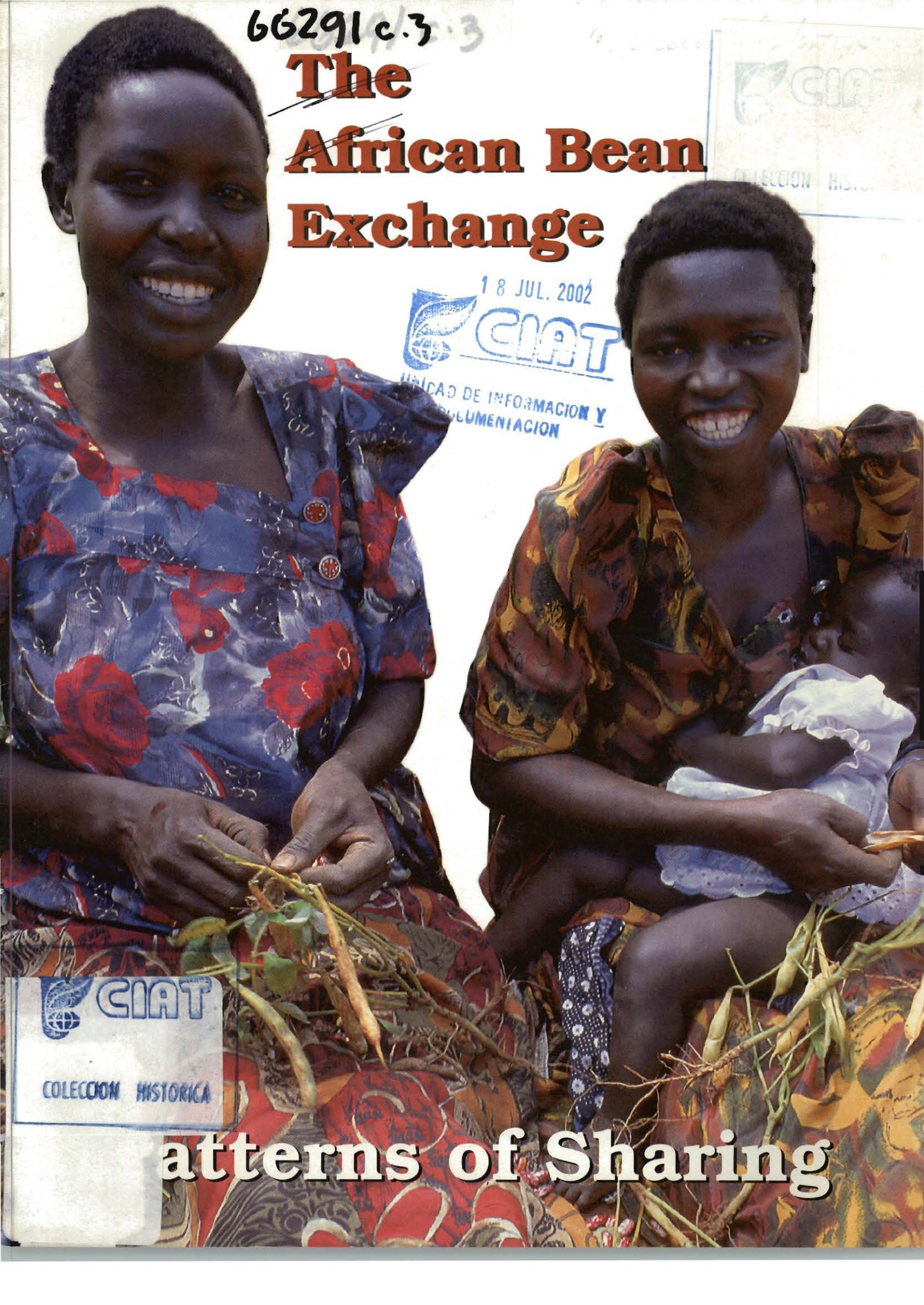


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The African Bean Exchange

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Patterns of Sharing

The Near-Perfect Food

Because of their high protein content and generous amounts of iron, folic acid, complex carbohydrates and other essentials, nutritionists characterise beans as “a near-perfect food”.

This quality is especially important for Africa, where protein deficiency and malnutrition plague millions of poor people—particularly children, whose growth, health and cognitive development all suffer as a consequence. For many rural and urban consumers, beans provide the least expensive source of calories and protein.

Beans grow on more than 3.5 million hectares in Africa, cultivated for subsistence and, increasingly, as a cash

crop by poor farmers, most of them women. In Rwanda alone, 95 percent of all farmers grow beans, which provide 32 percent of all calories and 65 percent of all protein consumed in the country.

Although bean yields in Africa have increased modestly during recent years, the rate of increase in production still lags behind population growth. The full realisation of this crop's potential to combat hunger and poverty requires a major research effort aimed at overcoming key constraints.

The secret to finding solutions lies in combining Africa's family and community tradition of sharing with new patterns of exchange between farmers and scientists.



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Leave it to the Experts

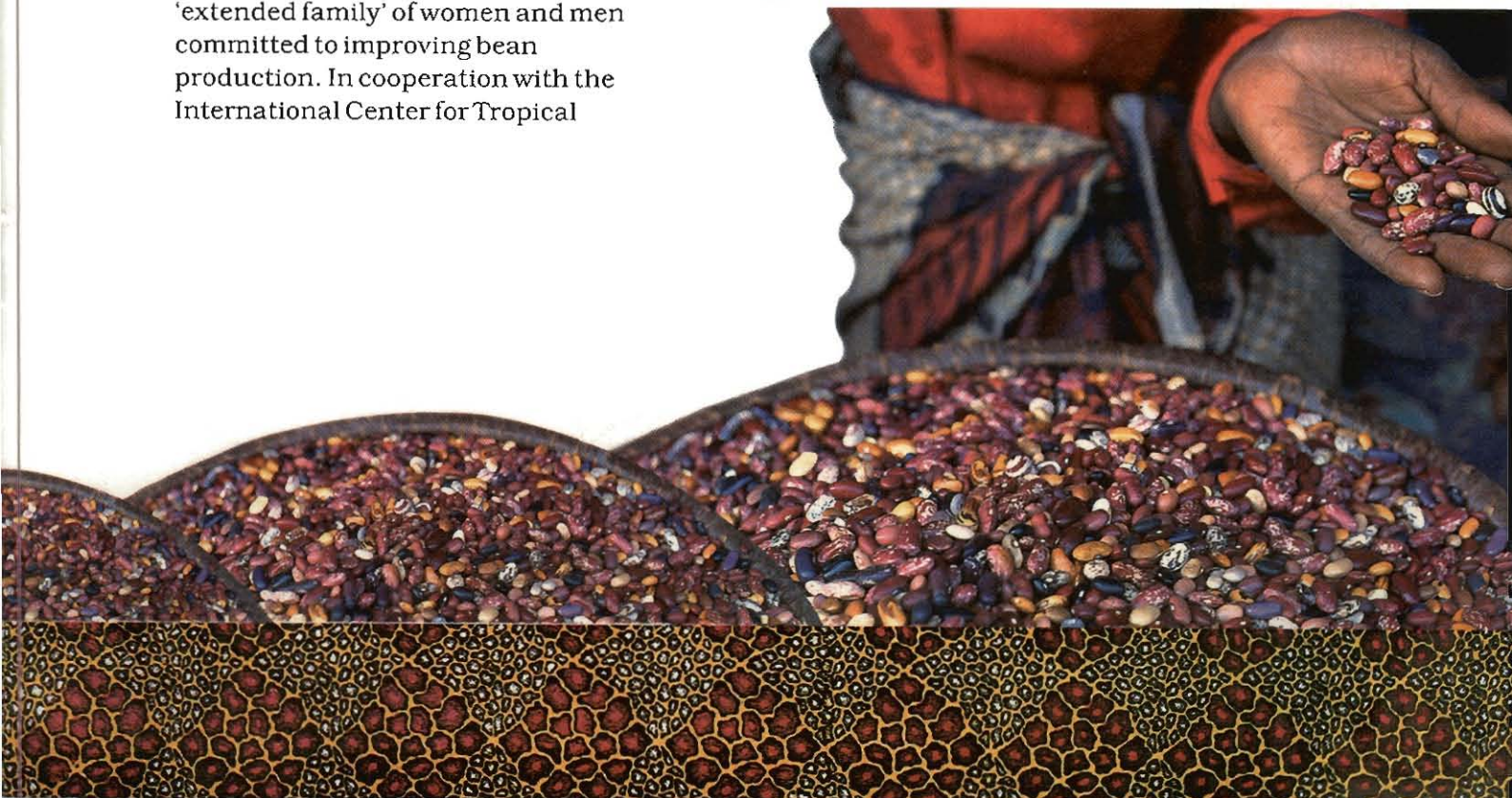
Elisabeth Myranturo, a farmer in southern Rwanda, has been sharing her knowledge of bean production for a long time. Before the country's horrific civil war in 1994, she and other women bean experts periodically visited a nearby research station, where they helped select experimental lines by rating the new seeds and their performance. Scientists in turn visited the farmers' homes to learn about the amazingly diverse mixture of beans that they grow.

In the late 1980s, Elisabeth adopted new climbing beans originating in the Mexican highlands. After the violence subsided in mid-1994, she obtained more seed of those varieties and others, some of it multiplied by bean researchers in neighbouring countries under the 'Seeds of Hope' project and disseminated by many non-governmental organisations (NGOs). This was a regional initiative that helped replenish Rwandan farmers' seed supplies and monitor the genetic diversity in their fields.

Elisabeth's story is also the story of an 'extended family' of women and men committed to improving bean production. In cooperation with the International Center for Tropical

Agriculture (CIAT), Africa's regional bean networks share improved seed, practices, and methods—with farmers as well as with colleagues in neighbouring countries and even in more distant lands.

Currently, two such networks operate within the Pan-Africa Bean Research Alliance (PABRA): the Eastern and Central Africa Bean Research Network (ECABREN) and the bean network of the Southern Africa Development Community (SADC). The following sections describe what they have accomplished and how.



Nowhere to Go But Up

A clear success story for the networks is the spread of productive climbing beans in the highland regions of eastern and central Africa. The story began with women like Elisabeth. In her country beans are a vital component of the daily diet, and high population density and scarce land make more intensive production an absolute necessity.

Representing an entirely new set of genetic diversity for Africa, the improved climbing varieties showed marked advantages (especially in yield and root rot resistance) over bush beans and local climbers. Farmers in Rwanda complained at first about their requirement for tall stakes, but with help from local NGOs they found a number of environmentally sound ways of obtaining these. Before the country's civil war, farm families planting the new seed were producing an additional 50,000 tons of beans, worth US\$12 million a year.

More recently, the achievements of Rwanda's bean experts have gone abroad. By the mid-1990s, scientists in Kenya and Uganda were already well along the road towards replicating Rwanda's experience by incorporating climbing beans into the banana and maize-based systems of their own densely populated highland regions.

In western Kenya, research is under way with a UK-funded local NGO to control root rot in these areas. Farmers are testing an integrated approach that combines improved germplasm with crop management practices, such as planting on raised beds and heavy use of organic matter. This work is linked to the Africa Highlands Initiative, coordinated by the International Centre for Research in Agroforestry (ICRAF).



Bush Beans for Buying Power

National programme and CIAT scientists have also registered important achievements in improving bush beans for highland and other environments. The impact of new varieties is particularly evident in Uganda and Tanzania, where their higher yields and disease resistance strengthen the food security of farm families and enable them to produce a surplus for the market.

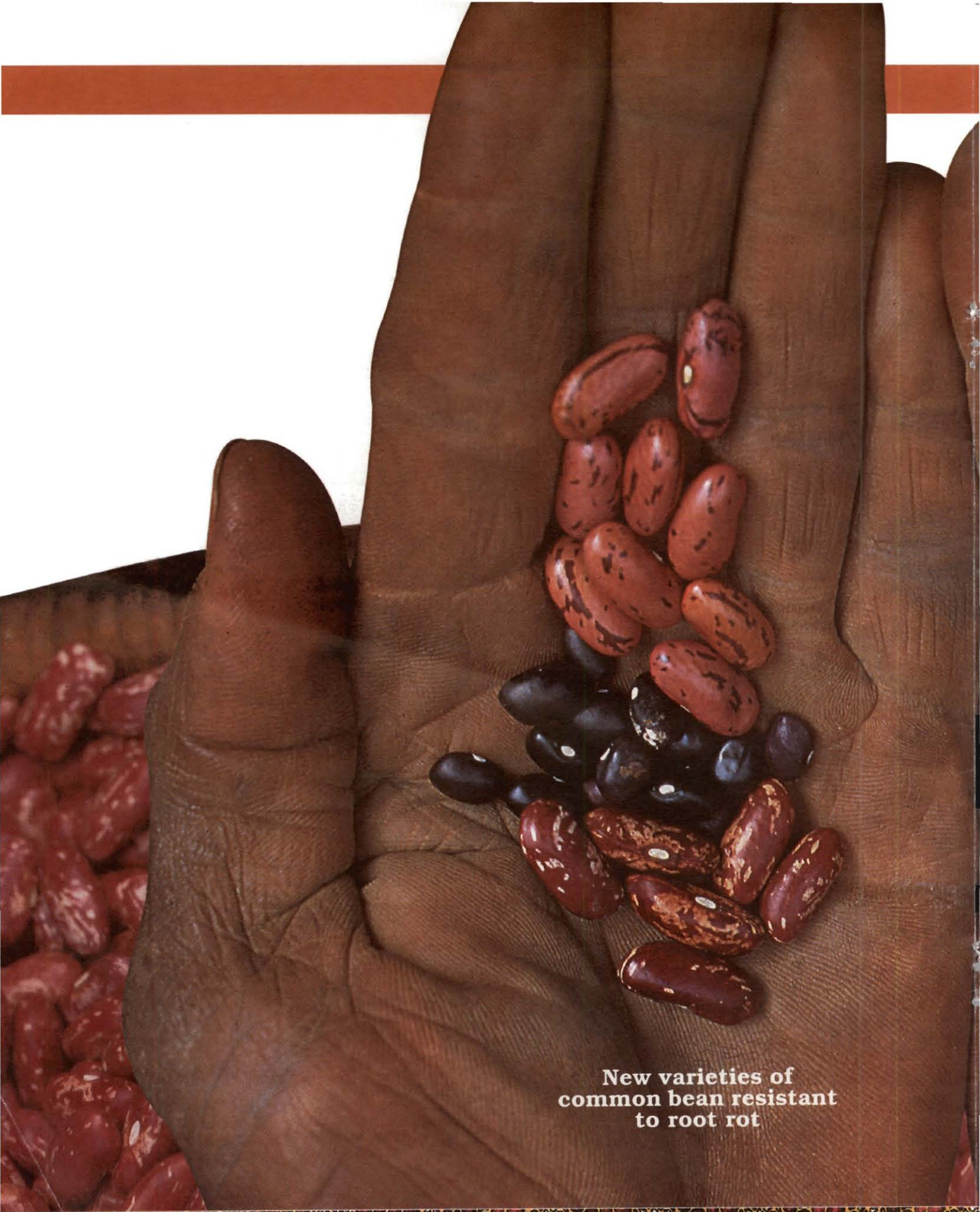
Most of the benefits go to women like Aida Namisano of Nabongo parish in southeastern Uganda. She has just adopted a new variety whose local name means 'very good tasting'. It looks like one of the local varieties, Aida explains, but has softer grains, so they take less time to cook, requiring less firewood. With cash income from the sale of these beans, "I can buy soap, salt, sugar, paraffin . . . everything," she adds.



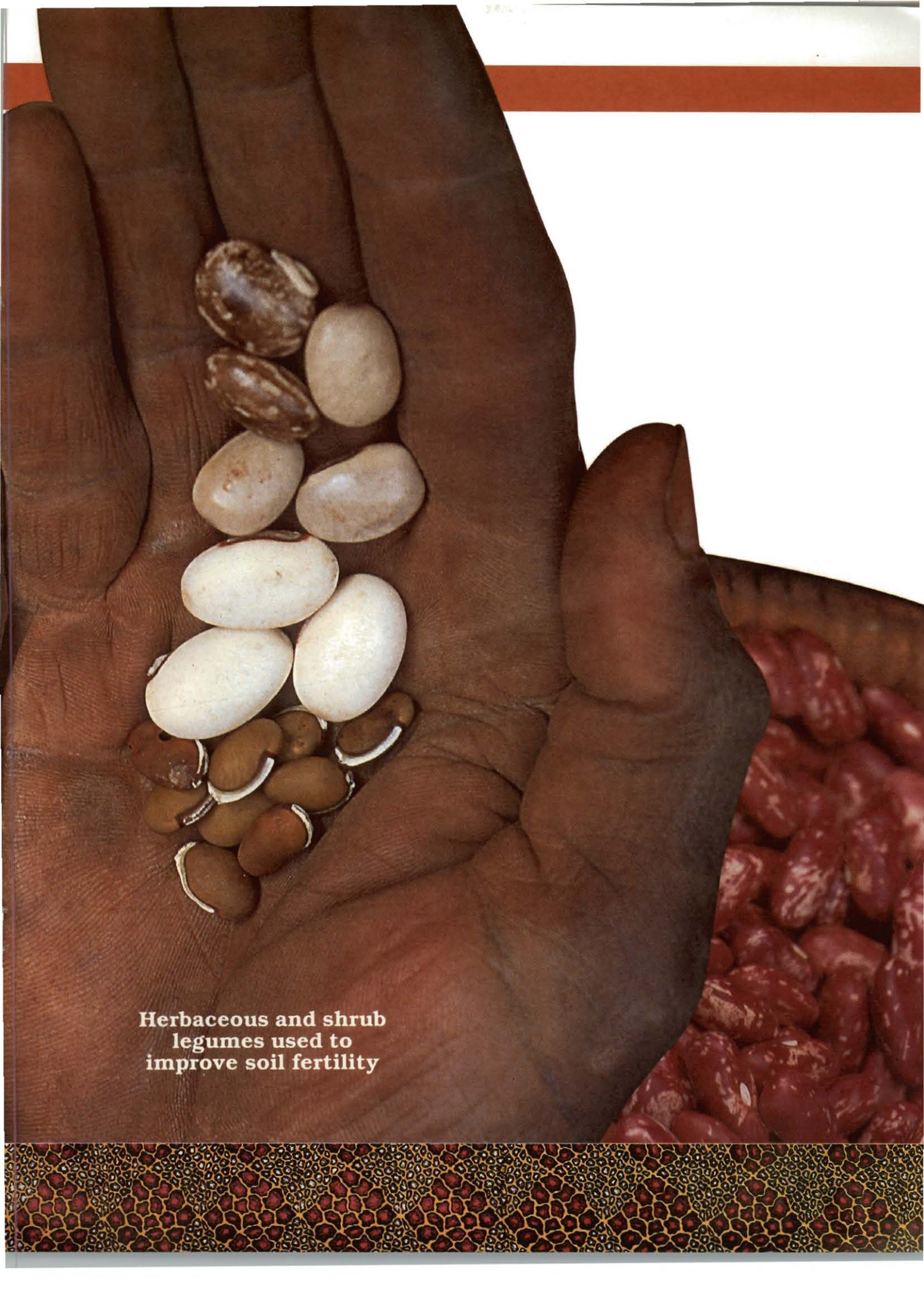
In the nearby village of Makhai, a group of women have begun producing good quality seed of new varieties for sale to other farmers. They have received support in this enterprise from CIAT and a local NGO. Soon after the last cropping season, the Makhai group sold all the seed they had produced and deposited the proceeds in a bank account at the nearby town of Mbale. The group's treasurer, Lorna Muboji, explains

that "as a group we can pool our assets as well as our labour to accomplish things that none of us can do alone."





**New varieties of
common bean resistant
to root rot**

A close-up photograph of a person's open palm holding a variety of legume seeds. The seeds are arranged in a vertical line, showing different colors and shapes: some are light brown, some are white, and some are dark brown. In the background, a large pile of red kidney beans is visible. The image is framed by a white border at the top and a decorative patterned border at the bottom.

**Herbaceous and shrub
legumes used to
improve soil fertility**

At the limits of Bounty

Researchers of the African bean networks are justifiably proud of their achievements. But they are also acutely aware that recent progress will be short-lived unless solutions are found to the fundamental problem of declining soil fertility, particularly in heavily populated regions where farm size is shrinking and cultivation is already intensive.

Part of the answer is to identify bean lines that tolerate infertile soils and use scarce nutrients efficiently. Towards this end African scientists are exchanging and testing germplasm through a project called 'Bean Improvement for Low Fertility in Africa'.

Another promising option is the use of herbaceous and shrub legumes (*Mucuna* and *Calliandra*, for example) as green manure crops. Recent experience in southeastern Uganda suggests that farmers are both receptive to this practice and highly inventive at finding niches for green manure crops in their complex farming systems. For example, Frederick Alifugani, a smallholder near the village of Ikulwe, is closely studying the effects of several such species and is sharing his experience with neighbours. "When they ask why I'm growing these plants," he says, "I explain the purpose of each one and give them seed to try on their own farms."



Patterns of Sharing

This pattern of sharing, common among farmers, is also a central feature of bean research aimed at helping them build lives that transcend mere subsistence. The sharing starts with joint decisions made by the bean networks' steering committees (each composed of one CIAT scientist and leaders of the national bean programmes) on priorities, responsibilities and allocation of funds. Other forms of exchange include:

- Cooperative trials that enable researchers to screen germplasm (from Africa and from CIAT headquarters in Latin America) for traits of interest
- Field monitoring tours in which participants visit experiment sites in various countries to exchange ideas and experience
- Interdisciplinary workshops that bring multiple viewpoints to bear on specific problems
- Regional gatherings where scientists report research results and account for the use of network funds

- Training at CIAT headquarters, local courses organised jointly with national programmes and other international centres, and degree studies

One testimony to the networks' success is the fact that national programmes have released 42 new bean varieties in Africa since 1984. Nineteen of these were breeding lines developed at CIAT headquarters, and another 23 were selected in Africa based on CIAT introductions.

Moreover, the bean networks were cited as effective models of how to build national research capacity by the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), which is made up of directors from the region's agricultural research institutes.

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