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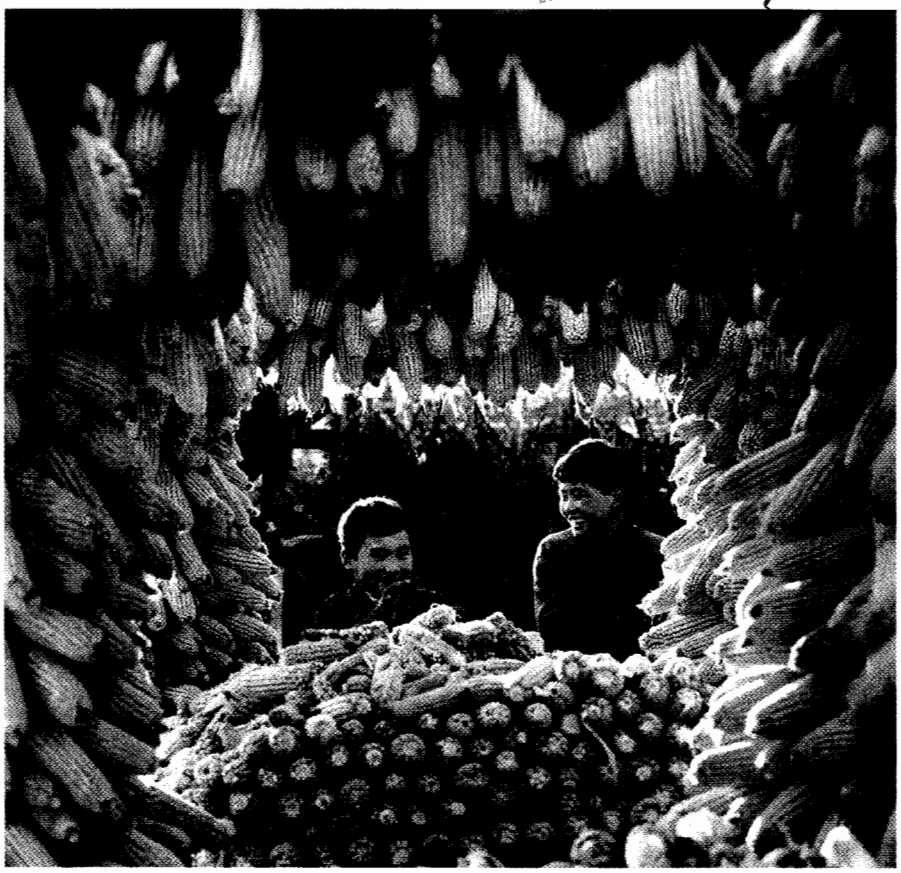

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Save our **SEEDS**

FRANCISCO REIFSCHNEIDER describes the importance of saving biodiversity in securing the world's food supplies

Biodiversity – the web of life, linking people to ecosystems – provides enormous benefits, including aesthetic, cultural, ecological, economic, educational, environmental, genetic, medical, recreational, scientific, and social services.

Humans and plants have had a close relationship ever since the birth of agriculture over 10,000 years ago. Plants, including food crops, are an important part of agricultural biodiversity, vital for nourishing and sustaining human society. And our dependence on them is growing.

Less than a dozen crops now feed most of the world's six billion people. Three cereals – maize, rice and wheat – alone supply 80 to 90 % of world caloric intake. Maize is the backbone of food security for Africa, providing 40 % of food calories in the eastern and southern parts of the continent alone. Rice is the principal food source for half of the world's population, including some of the poorest people in Asia. Worldwide, demand for wheat is surging: consumption has doubled in the last 30 years.

Natural resources

Plants are also a major source of drugs vital for human health and well-being. Of the top 20 drugs with an estimated market value of $6 billion, two are derived from natural resources, eight from synthetics modeled on natural compounds, and seven had pharmacological activity defined from natural products. Plant biomass also provides fodder for livestock, building materials, and soil

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conservation practices. Microbial diversity plays an important role in drug development and the manufacture of processed foods.

Yet biodiversity is being lost at unprecedented rates. One-third of terrestrial biodiversity is in vulnerable 'hot spots' accounting for 1.4% of the Earth's surface and is threatened with complete loss from natural disasters or further human encroachment. Such harmful practices as slash-and-burn agriculture, habitat conversion, massive exploitation of common pool resources, and the introduction of non-native species are major contributors to biodiversity loss. Conflicts and natural disasters also exact a heavy toll on biodiversity. Meanwhile, the Food and Agriculture Organisation estimates, budgets for many of the 1,470 genebanks worldwide have either been cut (as in 28% of developing countries) or have remained static (in a further 29%).

Conserving biodiversity

For over 30 years, the Consultative Group on International Agricultural Research (CGIAR) and its partners have recognized the importance of conserving biodiversity for sustaining the world's food supplies, both now and into the future.

It supports a network of 15 international agricultural research centres, of which 11 have genebanks that hold the world's largest collection of over 600,000 samples of crop diversity. These seed samples represent one-tenth of the world's unique samples of major food crops, with a large concentration of traditional farmers' varieties. The collections include not only important 'pillar crops' such as maize, rice and wheat but also 'orphan crops' such as cassava, cowpea, pearl millet, potato, sorghum, and yams. These crops are not attractive for private sector▶

investment but are major sources of income, food, and nutrition for millions of poor farmers.

CGIAR's efforts in conserving agricultural biodiversity span the entire spectrum: collection, characterisation, distribution, and regeneration. Its scientists work with farmers who traditionally save seeds from one season for planting in the next. Ex situ conservation involves storing seeds stored in genebanks under controlled environments. In situ conservation is done in farmers' fields and the wild. In vitro conservation is done in laboratory settings.

The collections are a valuable global public good, and a pivotal part of the global conservation effort. Saving seeds is costly: collectively, the CGIAR Centres spend over US$6 million annually. Simply holding a seed sample costs less than $1.50 per accession per year for most crops, except for maize, which costs $2.16, while in vitro conservation of cassava costs $12.

Naturally resistant

CGIAR's actions fully support international and national biodiversity conservation strategies, including the Convention on Biological Diversity. The recently-approved International Treaty on Plant Genetic Resources for Food and Agriculture has acknowledged the importance of the collections, and commended it for holding them in trust for the benefit of humanity.

Exchanging germplasm is vital for the agricultural research enterprise. A recent CGIAR study showed that the vast majority (over 80 %) of the [illegible] samples exchanged over the past [illegible] went to universities and national agricultural systems in developing countries. Agricultural [illegible] there use them to develop new crop [illegible] higher and more stable yields and [illegible] content, use less water and are natur[illegible] pests, disease and climatic stresses su[illegible] floods. The exchange of germplasm is a[illegible] growing awareness and [illegible] and biopiracy.

CGIAR's g[illegible] to notable [illegible] including:

- Quality Protein Maize containing twice the amount of beneficial amino acids (lysine and tryptophan) is currently grown in over 25 countries in Africa and elsewhere.
- New rices for Africa that combine the high productivity traits of Asian varieties and the ruggedness of African rice are now being planted on 100,000 hectares across Africa, 10,000 of them in Uganda alone.
- S-35, a new sorghum variety, is being grown on nearly 30 % of the total rainfed area for sorghum in Cameroon and Chad. Benefits include higher grain yields, and reduced production costs.
- New cassava varieties (Tropical Manioc selection) grown extensively in Sub-Saharan Africa are achieving on-farm yield gains of 40 % even without fertilizer.
- New bush bean varieties resist root rots and produce yields more than double those of commonly grown local varieties in east Africa. A recent impact study shows one of them was being grown by 50 % of farmers in one Kenyan district and by 2 % in [illegible].
- CGIAR seed [illegible] instrumental in rehabilitating local genebanks in war-affected countries such as Afghanistan, Burundi, Rwanda, [illegible] and Timor-Leste – efforts critical for restoring [illegible] the foundations of durable peace.

Agricultural biodiversity

Agriculture contributes on average [illegible] % of total gross domestic product in sub-Saharan Africa, the only region not on track for achieving the Millennium [illegible] Agricultural biodiversity has a [illegible] role in improving the productivity, profitability and [illegible] of agriculture in developing countries. [illegible] science-based efforts in promoting sustainable agriculture can create the next generation of farming technologies that will increase agricultural productivity, create wealth, reduce hunger and promote environmental sustainability. Saving biodiversity is indeed a useful way to benefit [illegible] people.

Francisco Reifschneider is Director of the Consultative Group on International Agricultural Research.