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SHAREHOLDERS IN SUSTAINABLE DEVELOPMENT

The United States of America and CIAT

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Relations between the USA and CIAT have been close since the late 1960s, when the Rockefeller and Ford Foundations established the Center. More than 160 U.S. citizens have worked at CIAT as scientists, administrators, students, and support staff. U.S. agricultural researchers regularly exchange ideas, information, and plant germplasm with CIAT. The strong financial support that the U.S. Government and private foundations give CIAT reflects the value placed on this close association.

By supporting CIAT's work, the USA helps tackle problems of concern to many U.S. citizens. One of these is political instability, which stems from poverty and other social problems, and which threatens U.S. trade and investment abroad. In many countries, poverty and political unrest are powerful incentives for rural-urban migration, and even for massive and unmanageable emigration to other countries, especially the USA. By collaborating with national governments to build up and stabilize food production, the USA can help reduce poverty and migration, and thus alleviate some of its own problems.

Stable, or sustainable, food production means feeding a constantly growing human population without degrading those natural resources (soils and water) on which production depends. In many developing countries, overpopulation and poverty lead farmers to use unsuitable production systems, which, in turn, degrade the environment. Because environments stretch across borders, the problems and dangers of

such degradation can affect the lives of people in distant lands. By supporting CIAT, the USA helps promote environmentally sound agriculture.

In promoting "green" agriculture, the USA also helps preserve valuable genetic resources with which to broaden the relatively narrow genetic base of its own agriculture. Examples of U.S. crops that are potentially vulnerable to disease and pest epidemics are maize, soybeans, rice, wheat, potatoes, tomatoes, cotton, oats, common beans, and peanuts. The origins and centers of genetic diversity of many of these crops are found in the Third World. U.S. scientists need to collaborate with research institutions such as CIAT, which are located in or near centers of diversity and often have large gene banks.

CIAT is a nonprofit, international agricultural research center whose mission is to help reduce poverty and hunger in the tropics. The Center applies science to improve agriculture while conserving natural resources. Traditionally, its research focused on four commodities vital to farmers and consumers in the tropics: cassava, common beans, rice, and tropical forages. Since 1992, CIAT has also emphasized natural resource management, with the aim of developing agricultural technologies that would sustain the region's soil, water, and genetic resources even as food production increases. Activities center on three major Latin American agroecologies: *savannas, hillsides,* and *forest margins.*

To achieve its mission, CIAT works with national agricultural programs, international bodies, and nongovernmental organizations, both in Colombia and elsewhere. Its main research station is located near Cali, Colombia. Five other stations in Colombia provide access to the wide range of ecological conditions needed to ensure the relevance of research. Of 126 principal staff who served in 1992, 25 were outposted to 14 other countries. Four of these were U.S. citizens who worked in Rwanda, Uganda, Tanzania, and Ecuador.

Citizens of USA at CIAT

In 1993, about 45% of CIAT's principal staff came from either the USA (24) or Colombia (31). The rest (66) came from another 27 countries. About 57% of the whole staff took advanced degrees at U.S. universities.

CIAT's first two directors general, who led the Center for 17 years, were from Oklahoma and Kansas. Nine members of the Board of Trustees, including 2 chairmen, were U.S. citizens. At least 90 more citizens have served CIAT as scientists, administrators, and support staff. About 32 were Ph.D. students who conducted their dissertation research at the Center, and 29 pursued shorter training programs (Table 1). Although most returned to work in American industry and universities, many former students maintained contact with CIAT in their subsequent employment. Five U.S. students even returned as staff. The Center not only receives students, but also directs researchers from developing countries to U.S. universities for advanced studies.

Because CIAT's germplasm bank and research facilities offer special opportunities, U.S. scientists visit CIAT for international meetings or to pursue specific research interests. Many visitors stay only the few days needed to attend a meeting, whereas others continue to complete research projects in cooperation with CIAT

Table 1. Citizens of the USA at CIAT, 1970-1992.

Positions held	Number
Directors general	2
Members of Board of Trustees	9
Staff scientists or administrators	88
Scientists trained at CIAT	
For Ph.D. research	32
For M.S. or other research	29
Support staff	2
Total	162

scientists. Some U.S. researchers take sabbatical leave at the Center, coming from Cornell University, USDA/ ARS (Pullman, WA), Louisiana State University, Purdue University, University of Massachusetts, and Fordham University.

CIAT's ties with the U.S. include aspects other than research. For example, a fiber-optic computer network is being developed for the Center through collaboration with the Carl Vinson Institute of the University of Georgia. Recently, a team from the Agricultural Communications Video Group (AGCOM), a U.S. agricultural film company based in Tucson, AZ, helped produce a video on CIAT's research strategies for the 1990s. The current heads of the Information and Documentation Unit and the Communications and Public Awareness Unit are U.S. citizens.

Collaboration Between the USA and CIAT

Formal projects with U.S. institutions range from applying biotechnology to rice breeding (funded by the Rockefeller Foundation) to supporting the regional bean program in eastern Africa, which serves Uganda, Kenya, Ethiopia, Somalia, and Sudan (USAID). Among many results of such collaboration are:

DNA fingerprinting of the rice blast fungus, permitting the development of more efficient rice-breeding strategies for both Latin America and southern USA (with Purdue University).

Development of the first transgenic plants of *Stylosanthes guianensis*, a promising legume for improving the fertility of tropical pastures (with Louisiana State University Agricultural Center).

Recent identification of arcelin, a protein that enables stored beans to resist the bean weevil, *Zabrotes subfasciatus*, a major pest (with Wisconsin University).

Development of a biological pesticide from a virus that kills the cassava hornworm, a caterpillar that

recently affected 34,000 hectares of cassava in Brazil (with the Boyce Thompson Institute at Cornell University in New York).

Collaboration to develop computer models of nutrient cycling in savanna environments (with Colorado State and Cornell Universities).

Each CIAT commodity program has a long history of exchanging plant material with U.S. researchers. CIAT holds the world's largest collections of common bean and cassava germplasm and an important collection of tropical forages. Through plant breeding, the Center's researchers have produced literally hundreds of promising materials. U.S. scientists in universities and the USDA, searching for such traits as disease resistance, often request both germplasm accessions and CIAT-bred materials. These are usually provided free. Similarly, CIAT researchers use plant material from U.S. institutions, including the U.S. Department of Agriculture.

Data, techniques, and ideas also flow freely both to and from the USA. CIAT scientists attend U.S. meetings as invited speakers, and contribute to major U.S. journals such as *Crop Science*, *Economic Botany*, *Plant Disease*, and *Environmental Entomology*. CIAT's Land Use Program actively exchanges data on, for example, climate, soils, and land systems with various entities, including the National Geophysical Data Center of the National Oceanic and Atmospheric Administration (NOAA) and many U.S. universities.

While research is CIAT's primary activity, the Center also works to strengthen the research capacity of national institutions in developing countries. In several cases, USAID or U.S. foundations have contracted CIAT to do "institution building." For example, USAID is funding CIAT bean scientists to help rebuild Uganda's research capacity in agriculture, which was decimated by a long civil war.

Financial Contributions from the USA

Generous contributions from the U.S. Government and U.S.-based organizations such as the Ford, Kellogg, Kresge, and Rockefeller Foundations make many CIAT activities possible (Table 2, Figure 1). Funds support (1) core (or basic operating and program) activities and special projects conducted by CIAT in Colombia and other developing countries, and (2) collaborative projects carried out by CIAT and U.S. institutions (*see* Appendix).

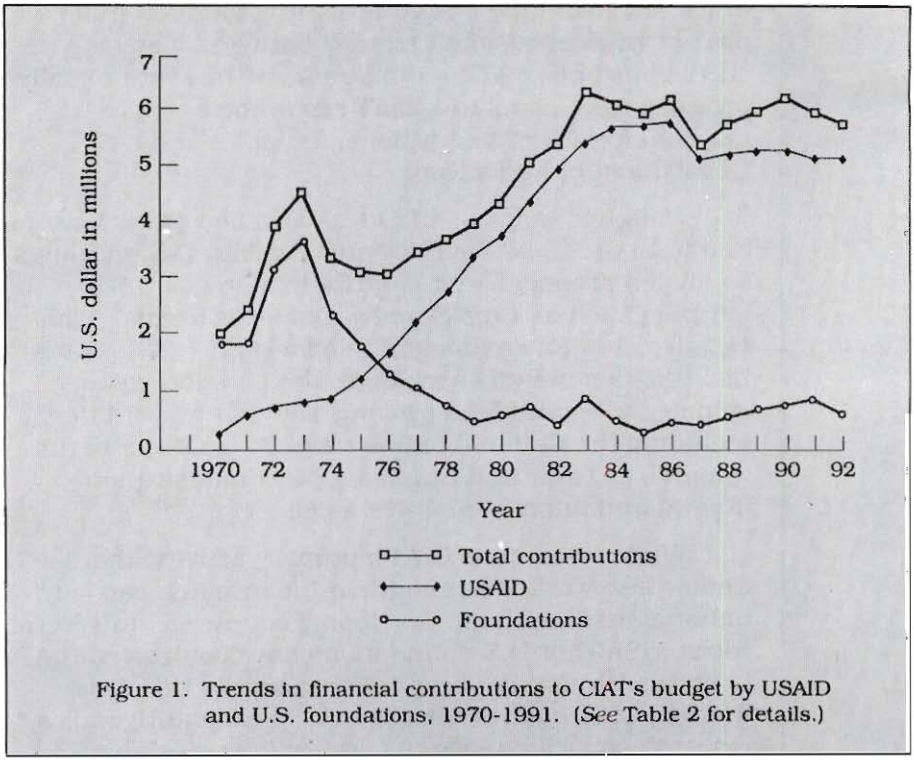

Figure 1. Trends in financial contributions to CIAT's budget by USAID and U.S. foundations, 1970-1991. (*See* Table 2 for details.)

Table 2. U.S. funds to CIAT (in thousands of U.S. dollars).[a]

Year	USAID		Foundations[b]				Total
	Core	Other[c]	Ford	Rockefeller	Kellogg	Kresge	
1970	259		500	1,194	115		2,068
1971	680		680	903	227		2,490
1972	721		720	1,527	185	750	3,903
1973	880		750	2,545	367		4,542
1974	950		819	1,309	280		3,358
1975	1,230	30	722	785	290		3,057
1976	1,700	27	400	610	300		3,037
1977	2,340	14	368	458	310		3,490
1978	2,600	104	200	300	320		3,524
1979	3,300	137	155	331	_		3,923
1980	3,650	83	100	347	133		4,313
1981	4,350	23	100	218	262		4,953
1982	4,900	36	75	173	148		5,332
1983	5,400	44	160	100	569		6,273
1984	5,600	68	140	100	266		6,074
1985	5,540	152	212	46	_		5,950
1986	5,600	102	256	239	_		6,197
1987	4,820	157	182	166	69		5,394
1988	4,820	424	80	207	225		5,765
1989	4,995	247	121	288	268		5,919
1990	4,920	454	101	307	449		6,231
1991	4,700	426	100	132	576		5,934
1992	4,700	364	100	268	356		5,788

a. *See* Figure 1 for trends.

b. Includes contributions to core and special projects.

c. Includes special projects and restricted core.

Looking to the Future

As agricultural science rapidly evolves and incorporates increasingly sophisticated techniques such as those of molecular biology and computer sciences, the Center's need for close contacts with advanced research institutions necessarily increases. Because the USA is a leader in these fields, CIAT will maintain its especially close ties with this country.

Conversely, new techniques in biotechnology increase the ability of agricultural scientists to manipulate useful genes for crop improvement. Scientists therefore need easy access to diverse genetic resources and to test new products in different environments. Because CIAT offers good facilities and access to a range of germplasm and environments, U.S. scientists will continue to strengthen their links with the Center.

Appendix: List of Current Projects Carried Out by CIAT with U.S. Funds

Donor Project	Date started	Date ended
United States Agency for International Development (USAID)		
Eastern Africa Bean Project	27/11/84	30/9/93
Mississippi State University		
Sorghum Project (INTSORMIL)	1/11/82	Undefined
University of Florida		
Monoclonal antibodies for serological differentiation of bean golden mosaic virus isolate	1/11/90	20/8/94
FUNDAGRO (Ecuador)		
Cassava in Ecuador	1/1/89	31/3/94
Kellogg Foundation		
Dry cassava production (Brazil)	1/3/89	30/6/93
Farmer participation in technology design	1/7/90	30/6/94
Rockefeller Foundation		
Rice/Biotechnology research	1/1/90	31/12/92
Cassava molecular mapping	1/1/92	31/12/94
Land use sociology	1/11/91	31/10/93
Agroeconomic study of cassava	1/1/88	31/12/90
International Fertilizer Development Center (IFDC)		
Soil fertility studies	1/1/89	30/9/92
Inter-American Development Bank (IDB)		
Training trainers	1/1/91	15/4/93
Agropastoral systems	1/7/90	31/3/93
United Nations Development Programme (UNDP)		
Biological control of cassava mites	1/10/85	31/3/92
Ecologically sound cassava plant protection in Northeast Brazil and West Africa	1/1/93	31/12/96

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