Appendix B

The CGIAR in Africa

Considerable interest exists in the work of the international agricultural research centers that are part of the Consultative Group on International Agricultural Research (CGIAR). This short description of the CGIAR's work in Africa was prepared by the CGIAR office in Washington, DC, and appears with permission.

Introduction

1. This paper presents a brief overview of the role and activities in Africa of the 13 international agricultural research centers (IARCs) funded by the Consultative Group on International Agricultural Research (CGIAR). Four of the centers are located in Africa and most of the other centers have significant programs in Africa.

2. The CGIAR was organized in May 1971 to bring together countries, public and private institutions, international and regional organizations, and representatives from developing countries in support of a network of international agricultural research centers and programs. The basic objective of this effort was then, and is now, to conduct research to produce technologies or technology components that will lead to an increase in the quantity and improve the quality of food production in the developing countries, The research supported by the Group concentrates on those critical transferable aspects of food production in the developing countries that are not adequately covered by other research facilities, and which are of wide usefulness, regionally or globally. Currently, the CGIAR network is involved in research on nearly all of the major food crops and many of the farming systems in the major ecological zones of the developing world (table B-l).

3. The international center's research and training activities deal with crops and livestock that encompass three-quarters of the food supply of the developing countries. These centers have already made significant contributions toward increasing food production in the developing countries. The total system is small, however, with expenditures of less than $200 million in 1984, compared to an estimated $2.6 billion spent by developing countries in 1980, and project loans/credits for agricultural research by the World Bank and IDA of $1.0 billion since 1980.

Current Activities

4. Africa figures very prominently in the current work programs of the international agricultural research centers funded through the CGIAR. Four of the 13 centers have their headquarters in African countries, and all the others have outreach activities that involve African countries in various ways. Table B-2 shows there were 291 IARC staff stationed in West, East, and Southern Africa in 1983 and that 122 of them were outside the four countries hosting Centers, mostly in outreach or "country programs." Outreach activities usually take the form of cooperative research programs in conjunction with national or regional institutions, or with other international institutions operating in Africa.

5. ***IARCs headquartered in Africa.*** The four centers that have their headquarters in Africa are the International Institute of Tropical Agriculture (IITA), the International Livestock Center for Africa (ILCA), the International Laboratory for Research on Animal Diseases (ILRAD), and the West Africa Rice Development Association (WARDA).

6. ***IITA*** (the International Institute of Tropical Agriculture), located in Ibadan, Nigeria, was the first international agricultural research center on the African continent. In the CGIAR system, IITA has worldwide responsibility for the improvement of cowpea, yam, cocoyam, and sweet potato, and regional responsibility for cassava, rice, maize, and soybean. Another important program is devoted to improving traditional farming systems. The object of the farming systems program is the development of more productive and ecologically sound alternatives to traditional systems of bush fallow and shifting cultivation. IITA works in a number of African countries, usually with funding specially provided for work in specific countries, on programs relating to one or more of the crops for which it is responsible or on farming systems, From its inception, IITA has been strongly identified with research on important food crops of the humid tropical areas of Africa.

7. ***ILCA*** (the International Livestock Center for Africa), located at Addis Ababa in Ethiopia, was established in 1974 to assist national efforts in tropical Africa by carrying out research and development on improved livestock production and marketing systems, by training livestock specialists in their region, and by gathering documentation useful to the African livestock industry. ILCA is one of the two CGIAR centers in Africa devoted to livestock research. ILCA is primarily concerned with the improvement of livestock production systems. Dealing with livestock in the context of deeply traditional, complex and diverse farm-

Table B-1 .–Centers Supported by the CGIAR, 1984

Acronym (year established)	Center	Location	Research programs	Geographic focus	1984 budget[a] (millions of dollars)
IRRI (1960)	International Rice Research Institute	Los Banes, Phillipines	Rice	Global	225
			Rice based cropping systems	Asia	
CIMMYT (1966)	Centro International de Mejoramiento Maiz y Trigo	Mexico City, Mexico	Maize	Global	21 0
			Bread wheat	Global	
			Durum wheat	Global	
			Barley	Global	
			Triticale	Global	
IITA (1967)	International Institute of Tropical Agriculture	Ibadan, Nigeria	Farming systems	Tropical Africa	21 2
			Maize		
			Rice		
			Sweet potato, yams	Global	
			Cassava, cowpea, lima bean, soybean	Tropical Africa	
CIAT (1968)	Centro International de Agricultura Tropical	Cali, Colombia	Cassava	Global	23.1
			Field beans	Global	
			Rice	Latin America	
			Tropical pastures	Latin America	
CIP (1971)	Centro International de la Papa	Lima, Peru	Potato	Global	**109**
WARDA (1971)	West African Rice Development Association	Monrovia, Liberia	Rice	West Africa	**29**
ICRISAT (1972)	International Crops Research Institute for the Semi-Arid Tropics	Hyderabad, India	Chickpea	Global	**221**
			Pigeonpea	Global	
			Pearl millet	Global	
			Sorghum	Global	
			Groundnut	Global	
			Farming systems	Semi-Arid tropics	
ILRAD (1973)	International Laboratory for Research on Animal Diseases	Nairobi, Kenya	Trypanosomiasis	Global	9 7
			Theileriosis	Global	
IBPGR (1974)	International Board for Plant Genetic Resources	Rome, Italy	Plant genetic sources	Global	3.7
ILCA (1974)	International Livestock Center for Africa	Addis Ababa, Ethiopia	Livestock production systems	Tropical Africa	127
IFPRI (1975)	International Food Policy Research Institute	Washington, DC, U.S.A.	Food policy	Global	4 2
ICARDA (1976)	International Center for Agricultural Research in the Dry Areas	Aleppo, Syria	Farming systems	Dry areas of West Asia and North Africa	20.4
			Wheat, barley, triticale, broad bean, lentil, chickpea, forage crops		
ISNAR (1980)	International Service for National Agricultural Research	The Hague, Netherlands	National agricultural research	Global	**35**

[a]CGIAR supported core budget net of capital at the bottom of the bracket (from 1983 Integrative Report)

SOURCE: Consultative Group on International Agricultural Research 'The CGIAR in **Africa," Washington,** D.C. **1984**

ing systems, ILCA is more concerned with systems analysis and management approaches and techniques than with individual commodities. Although cattle have received much research attention from ILCA, sheep and goats have also received considerable attention. ILCA focuses its research efforts on four ecological zones—arid, subhumid, humid, and highlands. ILCA's Humid Zone Program is based at IITA and the **two** centers cooperate in farming systems research in which animals do or may play an important role.

8. ***ILRAD*** (the International Laboratory for Research on Animal Diseases) was established in 1974 in Nairobi, Kenya, to assist in the development of effective controls for two major African livestock diseases: trypanosomiasis and theileriosis (East Coast Fever). Together these two diseases prevent livestock production in vast areas of a number of developing countries in Africa. The total foregone production—not only in milk and meat production, but also in production of leather, wool, fertilizer, animal power and

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Table B-2.—Number of IARC Senior Staff, Visiting Scientists, and Staff on Deputation, Posted in Each Country, 1982 or 1983[a]

Country	Total	Scientists not in IARC's host countries	CIAT	CIMMYT	CIP	BPGR	ICARDA	ICRISAT	IFPRI	IITA	ILCA	ILRAD	ISNAR	IRRI	WARDA
Total senior staff	757	23	73	77	73	15	63	84	30	105	50	30	29	104	68
Asia	***177***	***38***	***1***	***12***	***6***	***2***	***0***	***54***	***2***	***0***	***0***	***0***	***0***	***100***	***0***
Bangladesh	7	7	—	2	1	—			—	—	—	—	—	4	—
Bhutan	2	2	—	—	2	—	—	—	—	—	—	—	—	—	—
Burma	3	3	—	—	—	—	—	—	—	—	—	—	—	3	—
India	55	1	—	—	1	—	—	54	—	—	—				—
Indonesia	3	3	—	—	—	—	—	—	—	—	—	—	—	3	—
Pakistan	4	4	—	4	—	—	—	—	—	—	—	—	—	—	—
Philippines	90	5	—	—	2	1	—	—	2	—	—	—	—	85	—
Thailand	13	13	1	6	—	1	—	—	—	—	—	—	—	5	—
North Africa and Middle East	***74***	***15***	***0***	***1***	***4***	***2***	***63***	***2***	—	—	—	—	—	***2***	—
Cyprus	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Egypt	3	5	—	—	—	—	1	—	—	—	—	—	—	2	—
Syria	62	3	—	—		1	59	2	—	—	—	—	—	—	—
Tunisia	5	5	—	—	—	—	3	—	—	—	—	—	—	—	—
Turkey	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—
West Africa	***207***	***100***	***0***	***2***	***0***	***2***	***0***	***22***	***0***	***100***	***12***	***0***	***0***	***1***	***68***
Cameroon	12	12	—	—	—	—	—	—	—	12	—	—	—	—	—
Gambia	2	2	—				—	—	—	—	—	—	—	—	2
Ghana	5	6	—	2	—	—	—	—	—	2	—	—	—	—	2
Guinea	2	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Ivory Coast	1	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Liberia	35	1	—	—	—	—	—	—	—	1	—	—	—	—	34
Mali	11	11	—	—	—	—	—	2	—	—	3	—	—	—	6
Nigeria	86	13	—	—	—	—	—	4	—	73	8	—	—	—	—
Niger	12	12	—	—	—	—	—	9	—	—	1	—	—	—	2
Senegal	9	9	—	—	—	—	—	—	—	—	—	—	—	—	9
Sierra Leone	9	9	—	—	—	—						—	—	—	9
Burkina Faso (U. Volta)	15	15	—	—	—	2	—	7	—	5	—	—	—	—	—
Zaire	7	7	—	—	—	—	—	—	—	7	—	—	—	—	—

Table B-2.—Number of IARC Senior Staff, Visiting Scientists, and Staff on Deputation, Posted in Each Country, 1982 or 1983[a]—continued

Country	Total	Scientists not in IARC's host countries	CIAT	CIMMYT	CIP	IBPGR	ICARDA	ICRISAT	IFPR	IITA	LCA	LRAD	ISNAR	RRI	WARDA
East and South Africa	***84***	***22***	—	***5***	***5***	—	***0***	***4***	***0***	***2***	***38***	***30***	***0***	***0***	***0***
Burundi	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Ethiopia	33	1	—				—	—	—	1	32	—	—	—	—
Kenya	43	13	—	4	2	—	—	1	—	—	6	30	—	—	—
Malawi	1	1	—	—	—	—	—	1	—	—	—	—	—	—	—
Rwanda	2	2	—	—	2	—	—	—	—	—	—	—	—	—	—
Sudan	2	2	—	—	—	—	—	2	—	—	—	—	—	—	—
Tanzania	1	1	—	—	—	—	—	—	—	1	—	—	—	—	—
Zimbabwe	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Latin America	***186***	***29***	***72***	***55***	***57***	***1***	***0***	***2***	***0***	***3***	***0***	***0***	***1***	***1***	***0***
Argentina	1	1	—	—	—	—	—	—	—	—	—	—	1	—	—
Brazil	6	6	4	—	1	—	—	—	—	1	—	—	—	—	—
Costa Rica	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Chile	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Colombia	67	5	62	1	—	—	—	—	—	—	—	—	—	1	—
Ecuador	3	3	—	3	—	—	—	—	—	—	—	—	—	—	—
Guatemala	2	2	2	—	—	—	—	—	—	—	—	—	—	—	—
Mexico	52	2	—	50	—	—	—	2	—	—	—	—	—	—	—
Paraguay	2	2	—				—	—	—	2	—	—	—	—	—
Peru	54	3	3	—	54	—	—	—	—	—	—	—	—	—	—
Others	***67***	***11***	***0***	***2***	***1***	***8***	***0***	***0***	***28***	***0***	***0***	***0***	***28***	***0***	***0***
Holland	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Italy	6	6	—	—	—	6	—	—	—	—	—	—	—	—	—
Netherlands	28	—	—	—	—	—	—	—	—	—	—	—	28	—	—
Portugal	2	2	—	2	—	—	—	—	—	—	—	—	—	—	—
USA	30	2	—	—	—	2	—	—	28	—	—	—	—	—	—

[a]1983 data for CIAT, CIMMYT, CIP, IBPGR, ICARDA, ICRISAT, IFPRI, ILCA, ILRAD, ISNAR, and IRRI; 1982 data for others.

SOURCE: Consultative Group on International Agricultural Research, "The CGIAR in Africa," Washington, 1984.

animal by-products—is incalculable. Both diseases are caused by parasites that are transmitted by insect vectors; the tsetse fly carries trypanosomes while ticks transmit theileriosis. In both cases, the relationships among parasites, hosts and vectors are subtle and complex; intervention is difficult. ILRAD's emphasis is to identify and exploit disease control methods that rely on the immunological responses of the host animals. ILRAD works with other institutions to pool animal disease and production skills toward the solution of livestock problems in Africa. For example, ILCA and ILRAD work together with ICIPE (the International Center for Insect Physiology and Ecology) in a Trypanotolerance Network to study relationships of the parasite, the vector, the animal, and animal management in livestock that have some tolerance to trypanosomiasis. ILRAD hosts staff of several other CGIAR centers, including ILCA, at its headquarters in Nairobi.

9. ***WARDA*** (the West Africa Rice Development Association), located in Monrovia, Liberia, is a regional organization to promote self-sufficiency in rice in 15 countries of West Africa. The CGIAR helps to support the research activities of WARDA. WARDA seeks to develop improved rice varieties adapted to the region's agroclimatic and social conditions, and to develop improved farming systems that are appropriate to improved rice varieties and to socio-economic and agricultural conditions of the region. The WARDA program concentrates on four systems of rice production—mangrove swamp rice (somewhat saline conditions), irrigated rice, upland (rainfed) rice, and deep water rice.

10. ***IARCs With Programs Located in Africa.*** In addition to the four centers whose headquarters are in African countries, seven other centers have staff stationed in Africa engaged in a variety of activities in cooperation with national research institutions. The seven are the Centro International de Agricultural Tropical (CIAT), the International Maize and Wheat Improvement Center (CIMMYT), the International Board for Plant Genetic Resources (IBPGR), the International Potato Center (CIP), the International Rice Research Institute (IRRI), and the International Center for Agricultural Research in the Dry Areas (ICARDA). All of these centers are working on a range of crops that are important staple foods throughout Africa.

11. ***CIAT*** (the International Center for Tropical Agriculture) with headquarters in Colombia, has responsibility for the world germplasm collection of cassava and, in cooperation with IITA, is involved in supplying germplasm for cassava improvement programs in Africa. It carries on similar work for the common bean in East Africa and is now building up a nine member team to work on bean improvement there. CIAT has a large tropical pastures program in Latin America and is working to develop relationships between it and forage research efforts in humid and subhumid zones of Africa, particularly with ILCA.

12. CIMMYT (the International Maize and Wheat Improvement Center) is headquartered in Mexico, but the center has a number of ongoing programs in Africa. Some of these programs are supported by bilateral donors, and most are run on a cooperative basis with national institutions. The CIMMYT Maize Program has had staff working in national programs in three African countries—Ghana, Tanzania, and Zaire. The oldest of these programs began in 1973. CIMMYT also has a joint African maize program with IITA, located at Ibadan, Nigeria. The Wheat Program has staff members assigned to the East Africa regional program which includes 17 countries, from Ethiopia in**the north** to Lesotho in the south. In addition, the Economics Program has a regional economist headquartered at ILRAD in Nairobi who works with national research programs in Kenya, Tanzania, Malawi, and Zambia. Training is an important part of CIMMYT's contribution to African agriculture; during the period 1971-83, 187 trainees from tropical Africa were involved in the maize in-service training course, while from 1966-83, 96 trainees were involved in wheat in-service training. CIMMYT also provides at its headquarters and field research sites in Mexico training opportunities for visiting scientists from Africa.

13. IBPGR (the International Board for Plant Genetic Resources), located in Rome, was established to promote an international network of genetic resources centers to further the collection, conservation, documentation, and use of plant germplasm. Although IBPGR provides services to national and international organizations, it also supports and encourages research in genetic resources by other IARCs and national programs. It works closely with other centers in the CGIAR system. The IBPGR has sponsored a number of collecting missions in various African countries, notably in West Africa, and, from time to time, has stationed staff in Africa over extended periods of time.

14. ***ICRISAT*** (the International Crops Research Institute for the Semi-Arid Tropics) has its headquarters in Hyderabad, India, but much of its work is applicable to, designed for, and takes place in, semi-arid areas of Africa. The two major cereal crops for which it is responsible, sorghum and millet, are major staples especially in West Africa, and groundnut is a major crop in many parts of the continent. In 1983 ICRISAT had scientists posted to Bukina (sic) Faso (Upper Volta), Kenya, Mali, Niger, Nigeria, and the Sudan.

ICRISAT's work in West Africa has, in the past, taken place within the national research programs and has been largely designed to facilitate transfer of technology from India. It has become apparent that the types of sorghum and pearl millet varieties that gained substantial acceptance in India were not adapted to the ecological conditions and farm family needs in West Africa. As a result ICRISAT has decided to establish a research subcenter for the difficult environment of the Sahel in which it would have the facilities and capability to carry out the complete range of research activities needed. The ICRISAT Sahelian Center, being located near Niamey, Niger, should serve the longer term needs of the region. ICRISAT is in the process of establishing a regional team at Bulawayo, Zimbabwe, to meet the needs of Southern Africa and a regional team in Kenya to meet the needs of Eastern Africa. Discussions are underway on the Center's involvement in a regional grain legume program for Southern and Eastern Africa. Between 1974 and 1983 ICRISAT provided in-service training to 210 researchers from West Africa, 103 from Eastern Africa, and 51 from Southern Africa; another 31 researchers from Africa were Research Fellows or Research Scholars.

15. CIP (the International Potato Center), located in Peru, maintains several staff members in East Africa. Potatoes are not very widely grown in most African countries, but are of increasing importance. A regional scientist is located at ILRAD in Nairobi. This scientist oversees the cooperative research and training activities in the area. Two staff members reside in Rwanda and one lives in Burundi; their responsibilities include research on potato in those countries. Other regional representatives are stationed in Egypt and Tunisia. CIP also supports work of local scientists in Ethiopia and Kenya. A country network, PRAPAC (Programme Regional d'Amélioration de la Culture de Pomme de Terre en Afrique Centrale), which includes Burundi, Rwanda, and Zaire was established in1982. The network carries out research and training activities.

16. IRRI (the International Rice Research Institute), located in the Philippines, has a liaison scientist for the African region who is based at IITA in Nigeria and who works closely with WARDA and with national institutions. Because within the CGIAR system IITA has responsibility for research on rice in Africa, IRRI does not have a major direct presence in Africa but, through its International Rice Testing Program (IRTP), IRRI makes advanced rice materials available to WARDA and to various interested national institutions. IRRI has recently engaged in discussions of the feasibility of contracting for an outreach program in Madagascar which has rice production systems quite similar to those of Asia. Two scientists are in Egypt on a similar arrangement.

17. *ICARDA* (the International Center for Agricultural Research in the Dry Areas), located in Syria, has a program on faba beans (also known as broad or horse beans) in Egypt and the Sudan, and has stationed staff in those countries to help carry out the research. More recently, a research team has been stationed in Tunisia to work on barley and legume improvement with national research institutions in North Africa. ICARDA is developing working relations with ILCA in areas of livestock / crop production integration.

18. ***Other IARCs That Work in Africa But Do Not Have Resident Staff in the Continent.*** The remaining two centers do not have resident staff in Africa, but their work includes activities directly or indirectly related to Africa. The centers concerned are the International Service for National Agricultural Research (ISNAR), and the International Food Policy Research Institute (IFPRI).

19. ***ISNAR*** (the International Service for National Agricultural Research), located in The Hague, was organized in 1980 to assist developing nations to improve their national agricultural research capability. ISNAR has already been invited to assess the strengths and weaknesses of several national research systems in Africa, and has completed assessments of Bukina [sic] Faso (Upper Volta), Ivory Coast, Kenya, Madagascar, Malawi, Rwanda, and Somalia. ISNAR is deeply involved in a large project under the Cooperative Development for Africa Group to help upgrade agricultural research training.

20. ***IFPRI*** (the International Food Policy Research Institute), located in Washington, DC, works on policy issues relating to food and agriculture. IFPRI is devoting about 30 percent of its research to projects related to Africa, compared to about 18 percent during the past ten years. Published IFPRI Research Reports include studies on Food Security in the Sahel, Agricultural Research Policy in Nigeria and growth linkages in Nigeria (sic) and Kenyan agricultural exports. Proceedings of a major policy conference on accelerating growth in Sub-Saharan Africa is in the process of being published.

Impact of the CGIAR in Africa

21. A great deal of attention is being given by the CGIAR to the various African countries. As already mentioned, four of the centers are located in Africa, the largest number in any continent, and most of the others have stationed senior scientific staff to reside and work in various African countries. Research by the IARCs has already shown its relevance and use-

fulness for African agriculture, but adoption has been slowed by the general anti-agricultural policies of many African countries, the low level of infrastructure development, and the lack of inputs.

22. Improved maize lines from CIMMYT have helped to raise yields in Zaire and Tanzania, while IITA has developed maize lines with resistance to the devastating streak virus, and efforts are currently under way by a joint CIMMYT/IITA program to transfer streak resistance to local African maize cultivars. This will enable farmers to grow their accustomed local varieties while ensuring protection against the damaging streak virus disease.

23. CIP, in cooperation with national research institutions, has released potato varieties that yield well under farm conditions in Burundi, Ethiopia, Kenya, and Rwanda. In cooperative work with ILCA, CIP has obtained yields of80 tons per hectare in the Ethiopian highlands; such yields could increase farm incomes dramatically.

24. WARDA has tested and released a number of improved rice varieties for its West African member countries. Significant potential improvements exist for irrigated and deep-water rice.

25. IITA has made significant progress in developing high-yielding cassava varieties that are resistant to the destructive complex of diseases and insects that attack cassava in Central and West Africa. Some of this work was done in cooperation with the national program in Zaire. IITA has also made major progress in biological control of damaging cassava pests, particularly the cassava mealybug. The IITA cassava improvement program is a good example of the need for long-term research in Africa on major intractable problems. IITA uses germplasm from CIAT's major cassava germplasm collection in its improvement work.

26. IITA has developed sweet potato lines that are very resistant to attack by the sweet potato weevil, a major cause of post-harvest losses in that crop. These resistant lines are protected naturally from such insect attack, and spraying of insecticides is not required.

27. IITA and ILCA have worked to develop and improve alley-cropping, a form of agroforestry in which arable crops are grown between rows of perennial tree crops that can be used for several purposes such as fodder, wood fuel, and green manure.

28. ILCA, working with ILRAD and ICIPE (the International Center of Insect Physiology and Ecology), has developed a network to improve research and the development of information on trypanotolerant livestock in Africa. The network, which concentrates not only on trypanotolerant cattle but also on tolerant sheep and goats, places major emphasis on improving research and development activities in national institutions, and will help to provide guidance and financial support for participating scientists and institutions. ILCA has also been successful in using milk cows for animal traction in the Ethiopian highlands, thus providing a potential for the dual use of these cows by small farmers.

29. The above are but a few of the activities and accomplishments of the IARCs in their work relating to Africa. Many other opportunities exist; to capitalize on them will require commitment to agricultural development by African governments and improved research and extension services.

Issues and Options

30. It is generally agreed by agricultural research authorities and development experts that African countries should devote more attention and give higher priority to agriculture. Production must be increased and productivity improved. Much needs to be done, including reinforcement of policies that provide better incentives for farmers and the development of more productive agricultural systems. Each African country needs to build up a strong technology through research, and effective extension and information services that can assist farmers to increase productivity. The IARCs can be a good resource for national institutions in meeting such needs. However, in most circumstances, the services provided by IARCs can be of good use only where effective national programs exist. The IARCs can and do play a role in strengthening national institutions, but other international and bilateral organizations must provide financial support and technical assistance. In recent years the World Bank has identified national agricultural research as an area that requires more investment in most developing countries. Other multilateral and bilateral organizations have reached similar conclusions and are also giving increased attention to this need.

31. It is clear that the IARCs are generating, and will continue to generate, improved agricultural technology for Africa. Such technology can be adopted more quickly and effectively by nations that themselves possess an effective agricultural support capability. Broad cooperation by national, regional and international ororganizations will be required to strengthen African institutions to the level needed, and at the pace required.

—CGIAR Secretariat
October 1984