



Collaborative Activities of the Centro Internacional
de Agricultura Tropical - CIAT - with
National and Regional Agricultural Research
Institutions in the Caribbean: Proposed Strategy

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I. INTRODUCTION

The urgency to develop improved food production technology in the tropics led to the establishment of the International Agricultural Research Centers to serve and complement the actions of national agricultural research and development institutions. The Consultative Group for International Agricultural Research (CGIAR) was formed in 1971 to provide a mechanism for mobilizing broad-based financial support for the international centers. Although four international centers had already been formed and were being supported at that time, creation of the CGIAR signified the desire of donor agencies to continue long-term support of agricultural development in the tropics through a coordinated international centers mechanism. A total of nine research centers (IRRI, CIMMYT, IITA, CIAT, CIP, ICRISAT, ILRAD, ILCA, and ICARDA)¹ and four research/research support institutes (IBPGR, IFPRI, ISNAR and WARDA)¹ exist today.

Upon proposals by the Center's Board of Trustees and acting on the advice of its Technical Advisory Committee - a panel of top-level scientists which broadly oversees the technical program of the Centers - the CGIAR has approved the mandate of the individual centers and institutions so they complement each other in commodity coverage, geographic scope and institutional role. Within this arrangement covering most staple food crops in the tropics, CIAT has global responsibilities for common beans (Phaseolus vulgaris) and cassava (Manihot esculenta), and regional responsibilities in Latin America and the Caribbean for rice and tropical pasture species for acid-infertile soils. This paper aims at presenting and discussing CIAT collaborative research activities on these four commodities in the Caribbean region, and at analyzing current limitations and the proposed strategy, with the main objective of benefiting from the comments of all workshop participants.

^{1/} See Annex 1

2. OBJECTIVES AND ROLE OF CIAT

CIAT's objectives are:

"To generate and deliver, in collaboration with national and regional institutions, improved technology which will contribute to increased production, productivity and quality of specific basic food commodities in the tropics--principally countries of Latin America and the Caribbean--thereby enabling producers and consumers, especially those with limited resources, to increase their purchasing power and improve their nutrition."

This statement was developed to provide a condensed overview of CIAT's philosophy and operating objectives. While the Center expects to be flexible in responding to future needs for agricultural production technology, the statement's points should be applicable over future years.

CIAT plans to continue concentrating on the generation and transfer of agricultural technology. This does not negate the importance of institutional, social and political changes, but does imply a confidence that modern science and technology can contribute significantly to solving food production problems.

The objectives statement emphasizes the Center's strong conviction that accomplishing the desired results involves strong collaboration of national, regional and international agencies. Effective agricultural research is a continuum encompassing activities from conducting basic research to monitoring farmers' adoption of improved varieties and cultural practices. This research continuum includes many interacting institutions conducting basic and applied research and extension activities. National agricultural research institutions and the international centers play important roles in this institutional complex.

Of the various institutions in the research continuum, none is more important than the national agencies involved in agricultural research and development. Only through strong national programs can the new

technology be jointly developed and evaluated under varied local conditions, modified as necessary and transferred to farmers along with the essential support services required to make the technology useful. CIAT strives to maintain cordial and productive collaboration with its primary partners, the national institutions. Moreover, the Center works to strengthen the capacity of these institutions to carry out their functions as full and effective partners in the research continuum. Complementarity and cooperation are basic premises of the strategy.

It is essential that national programs be strengthened and that international centers be involved in only those activities in which they have a clear comparative advantage and can most effectively provide a useful service to national programs. CIAT's role in helping overcome technological and institutional constraints in its mandate commodities must be examined in this context.

Figure 1 displays the agricultural technology development process as four successive but interrelated stages--basic research, applied research, adaptive research and production. It also indicates the approximate extent to which CIAT and its principal counterparts, the national institutions, are involved within the process. Given CIAT's place between the more basic research institutions and collaborating national programs, the Center's activities must take two directions. First, CIAT must relate its technology generation efforts to developments in basic research conducted by other institutions. Second, all of CIAT's interlocking activities, whether in research or in international cooperation, must be designed to support and supplement collaborating regional and national research/development institutions.

While there are understandable pressures for national institutions to spread their research efforts over a broad range of export, plantation and food commodities, the international centers concentrate on basic foods, and because of the division of labor among individual centers³, have the luxury of devoting their efforts to only a few commodities. Thus by working with only a few crops, CIAT can make more rapid progress in developing technology for these commodities.

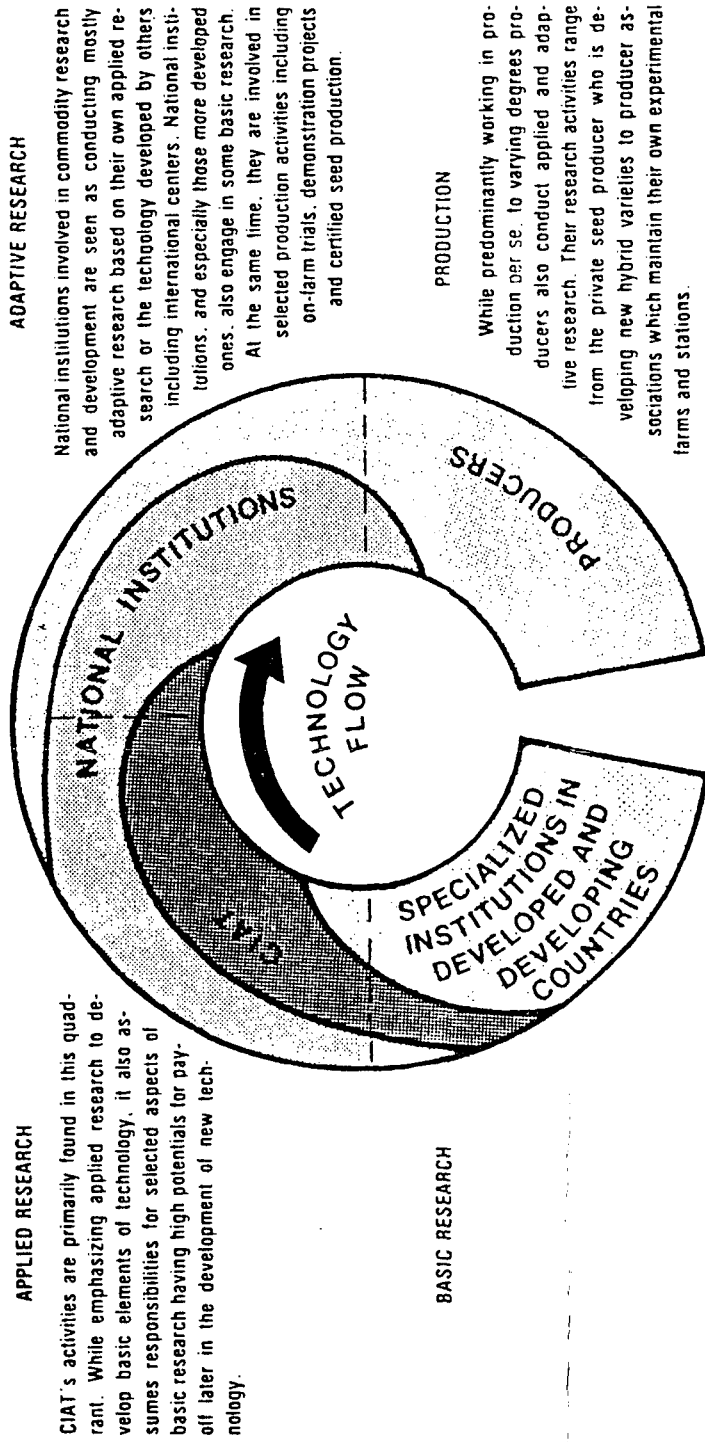


Figure 1. CIAT's location in the agricultural technology development process.

The Center's role in relation to the four commodities of its mandate must aim at being additive and complementary as well as stimulative and catalytic. Explicit recognition must be made of the role and activities of all national, regional and international institutions operating in a given region. This is particularly true in the case of the Caribbean. Avoiding unnecessary duplication among the many institutions operating in the region certainly will allow for a more cost-effective utilization of the total limited resources available. CIAT's activities in the region, and the proposed strategy for the future, should be analyzed within the existing institutional context.

Having analyzed CIAT's nature, objectives and roles as we see them, let me now briefly summarize past activities in the region in order to be able to identify the limitations to be overcome through future collaborative activities.

3. SUMMARY OF PAST AND CURRENT ACTIVITIES

Collaboration with national and regional programs could be expressed in terms of research (via germplasm transfers and evaluation), and training and information/documentation activities aimed at developing and consolidating research capabilities and research networks.

Germplasm development and evaluation

Analyses of production constraints of CIAT's commodities have indicated that of the possible research strategies, the largest impact on production would be generated by increasing the availability of improved germplasm adapted to environmental conditions and prevailing production systems. CIAT is involved in technology generation based on the collection, customized development and supply of new germplasm. Development of non-site-specific agronomic components are coordinated with germplasm development activities. Site specific agronomic components are the responsibility of national programs.

Table 1 summarizes the number of accessions of beans, cassava (clones) and tropical pastures from CIAT's germplasm bank sent upon request to collaborating institutions. Table 2 summarizes the number of specific nurseries of beans, cassava, rice and tropical pastures sent to countries in the region for evaluation. Results of these nurseries are normally evaluated jointly by national (or regional) programs and CIAT scientists in special visits to the trial sites and in the periodic network workshops held at CIAT headquarters.

Even though the figures are significant, there is a long route to be covered in as much as all countries in the region have not been covered nor have improved varieties as yet reached, farmers' fields in significant magnitude although these are a few outstanding exceptions. Rather than listing the advances made through the collaboration between CIAT and national and regional programs in the Caribbean, and the ones to come from present collaborative activities which are indeed many and obvious to those of us familiar with these activities, I have purposely decided to emphasize in this presentation the need to strengthen and reorient them through more effective regional mechanisms of cooperation.

Building human capital

A central strategy of the Center since its beginning has been the strengthening of commodity research groups within national agricultural research institutions. By providing research training opportunities, CIAT can make an important contribution to strengthening its national counterparts. At the same time, training provides an efficient vehicle for the transfer of improved research and production technologies. Insufficient qualified manpower is one of the most serious limiting factors in development of new technology. Available data support the belief that many countries in the Caribbean have a low level of human resources available for research and extension, in relation to the value of agricultural products produced and consumed. Major responsibility for multiplying trained agricultural scientists continues to lie with universities in the region. Providing scholarships for advanced degree training should remain the responsibility

TABLE 1. Number of accessions from CIAT germplasm bank sent to Caribbean countries. 1978 - 1982

Country	Beans	Cassava ¹	Tropical Pastures	Total
Barbados		8		8
Cuba	302	179	133	614
Curaçao	6			6
Dominica		2		2
Dominican Republic	658	46		704
Grenada	15			15
Haiti	29	88		117
Jamaica		15		15
St. Lucia		3		3
Trinidad and Tobago		1		1
Virgin Islands		32		32
	—	—	—	—
Total Caribbean	1,010	374	133	1,517

1/ Clones

TABLE 2. Number of nurseries/trials and accession/varieties included in collaboratives trials in the Caribbean countries, 1976-1982

Countries	Beans		Rice		Tropical Pastures		Total	
	Trials	Varieties	Trials	Lines	Trials	Accessions	Trials	Accessions
Belize	5	109	57	1,779	1	28	63	1,916
Cuba	17	256	43	1,819	5	130	65	2,205
Dominican Republic	18	243	29	1,883	5	132	52	2,258
Guyana			68	2,942	1	28	69	2,970
Haiti	11	126	27	1,203			38	1,329
Jamaica	8	110					8	110
Surinam			10	495	1	19	11	514
Trinidad and Tobago	3	33	2		2	38	5	71
Total Caribbean	62	877	234	10,121	15	375	311	11,373

of national programs with the support of donor institutions. Some research institutions, particularly universities, emphasize academic, publication-oriented disciplinary research. This affects the orientation of professionals trained in these institutions. Joint efforts emphasizing problem-solving, production-oriented, interdisciplinary research, can demonstrate that practical research is also highly stimulating and intellectually rewarding. CIAT has a comparative advantage in providing postgraduate training in specialized commodity areas and helping increase the available human resources in these particular areas.

Tables 3, 4 and 5 summarize the number of professionals from the region trained at CIAT since 1971. Even though numbers are significant, and in balance with the population of the region vis-a-vis the rest of Latin America (see Table 6) present needs exceed them by far. This is due to a number of reasons among which, institutional and job instability are, no doubt, the most important ones.

Information and Documentation

The linking of individual researchers and research groups through the establishment of research networks is a major mechanism for creating and maintaining research and development momentum for any given commodity. Commodity based research networks not only facilitate the exchange of information and materials between national and international levels, but also serve to transfer technology between national programs. Appropriate backstopping of networks through production and distribution of information and documents plays a key role in their development and consolidation. CIAT develops and produces technical message packages that include the following series:

- Technical annual reports; publications that describe CIAT and network research advances in each commodity.
- Periodic commodity networking oriented newsletters.
- Technical publications, including conference proceedings, monographs, production manuals and field problems guides, aiming at providing relevant technical information to networks participants and interested professionals.

TABLE 3: Number of professional trained in post-graduate courses and in-service at CIAT. 1969-1983

Country	1969								Total
	1976	1977	1978	1979	1980	1981	1982	1983*	
Belize			4	3	1		3		11
Cuba			10	15	11	18	2	6	62
Dominican Republic	29	5	9	20	8	7	15	5	98
Guyana	3	1	2	1			2		9
Haiti	1			5	7	2			15
Jamaica	1	1		1			2		5
Surinam							1		1
Trinidad and Tobago			1				5		6
Total Caribbean	34	7	25	45	27	27	30	11	207
Total CIAT	667	186	285	301	266	212	214	126	2257
% Caribbean	5.10	3.76	8.77	15.00	10.15	12.74	14.02	8.73	9.17

* January - August 1983

TABLE 4: Number of professionals trained in postgraduate courses at CIAT
by commodities, 1971-1983¹

Country	Beans	Cassava	Tropical			Other	Total
			Rice	Pastures	Seeds		
Belize	1		3	4	2	1	11
Cuba	13	12	9	20	5	3	62
Dominican Republic	16	18	6	16	22	20	98
Guyana		4	2	1	2		9
Haiti	3	4	4	1	2	1	15
Jamaica			1		3	1	5
Surinam					1		1
Trinidad and Tobago		1			5		6
Total Caribbean	33	39	25	42	42	26	207
Total CIAT	449	410	277	411	318	392	2257
% Caribbean	7.35	9.51	9.03	10.22	13.21	6.63	9.17

^{1/} January - August 1983

TABLE 5: Man/month of professionals trained at CIAT from Caribbean countries

Country	1969								Total
	1976	1977	1978	1979	1980	1981	1982	1983*	
Belize			10	15	6		4		34
Cuba			21	62	56	66	6	20	230
Dominican Republic	248	39	24	52	31	23	38	17	472
Guyana	4	2	2	1			3		12
Haiti	12			10	22	8			(51)
Jamaica	4	1		2			3		10
Surinam							1		1
Trinidad			1				7		8
Total Caribbean	268	42	58	142	115	97	62	37	818

* January - August 1983

TABLE 6. Caribbean Population, countries and islands. 1980

Country	Population	
	'000 persons	%
Antigua	75	0.27
Bahamas	230	0.83
Barbados	252	0.91
Belize	162	0.58
Cuba	9,970	35.84
Dominica	83	0.30
Dominican Republic	5,947	21.38
Grenada	111	0.40
Guyana	884	3.18
Haiti	5,809	20.88
Jamaica	2,172	7.81
Montserrat	12	0.04
Netherland Antilles	267	0.96
St. Kitts	74	0.27
St. Lucia	118	0.42
St. Vincent	97	0.35
Surinam	491	1.77
Trinidad and Tobago	<u>1,062</u>	<u>3.82</u>
Total Caribbean	27,816	7.56
Total Latin America and Caribbean	368,138	100.00

SOURCE: Celade. Centro Latinoamericano de Demografía. "Boletín Demográfico". Año XII. No. 24. Santiago de Chile, Julio de 1979.

- Audiotutorial units on specific relevant field problems and methodologies. These units have proven to be highly efficient communication means for reaching larger audiences of researchers, extensionists and students.

In addition, documentation services provided to subscribers include periodic publications of pages of contents of journals, periodic publications with abstracts per commodity, and literature search services.

Table 7 summarizes the distribution of these materials in the Caribbean countries. Again, even though the numbers are large, we feel that there must be a larger relevant audience yet to be reached with selected materials. Identification and updating of such audience could be best done in collaboration with national and regional institutions through effective and continued networking.

4. COMMODITY RESEARCH NETWORKS

In agriculture, joint and coordinated research efforts around common problem in various locations provide for much more significant advances than individual research projects in a single location. This is particularly true in the case of rainfed agriculture and in uncontrolled environments (e.g., without plant protection and high fertility treatments). These gains are commonly labeled "economies of scales".

While there are significant economies of scale to be gained through commodity based research networks, some of these economies could be lost when networks became too large and deal with many different problems. Scientists from most countries in Latin America and the Caribbean participate in CIAT's sponsored research networks. While being very enthusiastic about network accomplishments up to now, a felt need is shared among the participating scientists to further decentralize the activities of these networks along common technical problems, often associated with subregions. Even though homogeneity of problems to be faced by network participants is the overriding criteria for organizing research networks, there are other conditions required for them to

TABLE 7: Number of persons and institutions included in the distribution list of CIAT publications and/or documentation services.

September 1983

Country	Exchange	Free Distribution List			Total
		Spanish	English	Subtotal	
Antigua			2	2	2
Barbados	2		6	6	8
Belize	1		15	15	16
Cuba	18	129	5	134	152
Dominican Republic	13	132	2	134	147
Guadalupe	2	1	2	3	5
Guyana	1	3	14	17	18
Haiti	1	7	18	25	26
Jamaica	2	2	17	19	21
St. Lucia	2		1	1	3
Surinam	3		9	9	12
Trinidad and Tobago	14	4	18	22	36
Virgin Islands			1	1	1
Total Caribbean	59	278	110	388	447

operate effectively. The main ingredients for successful networking were distilled in the Second Review of the CGIAR in 1981, and summarized by Plucknett and Smith⁴ as follows.

"Networks function effectively when: (1) the scope of the research is well defined, (2) the problem is shared by all the participating countries, (3) activities are restricted to a geographic region, thereby facilitating communications, (4) participating institutions are involved as equal partners, (5) each participant gains from the association and therefore enthusiastically supports it, (6) participating institutions have funds to collaborate fully, (7) the local institution has sufficient capability to provide strong and enlightened scientific direction."

Before presenting CIAT's proposed strategy for the Caribbean, I will attempt to briefly analyze some of the characteristics of the region regarded as limitations to be faced in regional networking.

Limitations

The territorial status of many of the islands is regarded by some as politically sensitive and limiting to the involvement of regional and international institutes aiming at supporting developing countries. While this may be a political fact, it is also true that segregating such territories from collaborative agricultural research will not solve the political problem but rather increase existing distances. Furthermore, to the extent that the home country is willing to support agricultural research activities in the respective territory, the overall network could benefit from their scientific participation. From the technical point of view CIAT, as a non-political institution, does not regard the political status of any island or territory as a limitation, provided that the network coordination is hosted by a regional research institution.

^{4/} Networks and Networking in the CGIAR, Draft 22 July 1983. To be included in the 1983 CGIAR Integration Report.

The wide heterogeneity in country size and in degree of development of national research programs is viewed by many as a limiting factor to networking. In my view this is not a serious limitation, provided that the above set of conditions are met, particularly number 6. That is, either the respective country or a regional institute must fund the in-country research activities independently of the network in order to provide for the desirable partnership environment. The fact that some countries can contribute their experiences and knowledge to the network in the benefit of others is, after all, one of the main objectives of networking. The network should, however, provide opportunities for everybody to have net gains and for this even the smallest participant national program should contribute with its research.

Effective communication is a necessity in networking. Different languages could be a barrier to full participation of scientists that are not fluent in the network's official language. Two or more official languages are feasible but rather costly. I am not suggesting that a common language should be the criteria to define the scope of the network, but rather commonality of researchable problems. A common language will facilitate communication and thus it should be an additional criteria to be considered. Decentralized sub-networks by language, with strong links are alternatives that merit consideration. CIAT's dual language policy--Spanish and English, helps in this regard.

Country membership in regional institutions such as IICA, CARDI and University of West Indies - UWI, varies. This is sometimes regarded as a potential limitation in the ability of such institutions to serve in coordination roles for regional network activities. These limitations must be overcome to avoid duplication of efforts and dilution of activities and resources. Competitiveness among bilateral programs, regional and international institutions is sometimes healthy for them, but no doubt diluting for national programs that have only limited human resources to devote to the many goals and tasks before them. When the plan of work of these

institutions involves along the same commodity(ies), coordination of these efforts into a single thrust is crucial.

Finally, a fact to be faced is that not every one of the CIAT-mandated commodities is important in every country. Undoubtedly, a given commodity is of more present or potential importance in some countries than in others. The comparative production advantages of each country, and its assigned research and crop development priorities, need to be fully recognized by the organizers of each commodity network. After all, there is plenty of room for specialization and trade within the region. The current problems with balance of trade that are faced by most countries in the region could conceivably be managed by diversifying ~~from~~ agricultural production, with each country specializing in those commodities for which it has comparative intra-regional trade advantages vis-a-vis the other countries. As in the case of sugar cane, total specialization is highly risky, but aiming at full self-sufficiency in all commodities, even where feasible, could also be rather inefficient in social terms.

5. PROPOSED STRATEGY: A SUMMARY

The audience by now must be well aware of CIAT's strategy for international cooperation in the Caribbean. CIAT aims at decentralizing the existing Latin American and Caribbean networks it sponsors into four regional commodity research networks for beans, cassava, rice and tropical pastures. These Caribbean networks are to be conceived and developed jointly with regional institutions in close consultation with interested national programs. These networks are to be initially arranged around previously identified common production constraints and problems, and grow in geographic scope as research advances. They are to be based around existing institutional, human and infrastructural resources, and be guided by principles of complementarity and additiveness, in order to be catalytic, stimulative and cost-effective.

The networks' coordination should be based at a regional institution in a location (a) easily accessible to all participating countries by air travel, (b) where there exists an on-going regional and/or national research program with reasonable government support and trained personnel, and (c) where environmental conditions are reasonably representative of production zones in the region. The network coordination should operate under the policies and orientation of a Steering Committee formed by one representative from each cosponsoring institution including CIAT and by scientists selected by the initial group of network participants.

The institutions cosponsoring the network should be able to commit their own funds/resources to network support activities. CIAT could assume responsibilities for short courses training, specialized in-service training and postgraduate dissertation research at CIAT. In addition, CIAT could provide some information and documentation services to network participants. Besides backstopping support of specialists from its commodity programs CIAT would provide for interlinks with the other regional commodity networks. Given CIAT headquarters location and the limited number of flights from Colombia to the region, there is a need to post liaison staff to service the different proposed commodity networks in the region. Backstopping field consultation visits of specialists from CIAT commodity programs could then be better organized by the respective liaison staff.

The remaining activities of each network should be funded through a long term special project. The project should provide, in general, sufficient funds for:

- a CIAT research scientist with appropriate support staff to ~~and~~ conduct collaborative research in selected locations and act as liaison with CIAT programs;
- a few degree training (MS level) fellowships;
- opportunities for specialized in service training;
- short regional courses;
- in-country commodity production courses;

- full workshop and multilocal workshops;
- publishing workshop proceedings, monographs and production manuals;
- strategic research support of high region-wide interest with immediate application in several countries integrating the network; and
- travel for a few short term consultants from participating and other institutions.

6. CONCLUSION

It is within CIAT objectives and mandate to assist and foster national research programs in the Caribbean in beans, cassava, rice and tropical pastures. We believe that we have a lot more to offer than up to now in terms of improved germplasm, new germplasm custom-developed for overcoming the major production constraints in the region, in postgraduate training opportunities in short courses, in-service specialized training and dissertation research, and in reinforcing and backstopping research and networking activities through opportune information and documentation services.

We also believe that the most cost-effective and appropriate way to capitalize these possible contributions and to achieve a high degree of research cooperation in the region is through the decentralization of the existing CIAT sponsored networks into, in this particular case, commodity research networks for the Caribbean, jointly sponsoring them with regional research institutions. Last but not least, in as much as CIAT is a donor funded institution, and the proposed strategy implies additional activities, we can only commit to this end a similar amount of resources to those currently dedicated to the region, and thus, special project funds ought to be sought for this specific purpose. We look forward to your suggestions.

ANNEX 1. INTERNATIONAL AGRICULTURAL RESEARCH CENTERS AND INSTITUTIONS

Center and Institutions	Full Name	Headquarter Location	Commodities
IRRI	International Rice Research Institute	Philippines	Rice
CIMMYT	International Maize and Wheat Improvement Center	Mexico	Maize, Wheat
IITA	International Institute of Tropical Agriculture	Nigeria	Farming systems, maize, rice, root and tubers (sweet potatoes, cassava, yams). Food legumes (cowpea, lima bean, soybean).
CIAT	International Center for Tropical Agriculture	Colombia	Beans, cassava, rice, tropical pastures
CIP	International Potato Center	Peru	Potato
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics	India	Chickpea, pigeonpea, pearl millet, sorghum, groundnut, farming systems
ILRAD	International Laboratory for Research on Animal Diseases	Kenya	Trypanosomiasis, theileriosis
ILCA	International Livestock Center for Africa	Ethiopia	Livestock production system
ICARDA	International Center for Agricultural Research in the Dry Areas	Syria	Farming systems, cereals, food legumes, forage crops
IBPGR	International Board for Plant Genetic Resources	Italy	Coordination and support of germplasm collection and conservation
IFPRI	International Food Policy Research Institute	USA	Research on food and agricultural economic policies
ISNAR	International Service for National Agricultural Research	Netherlands	Institutional building assistance
WARDA	West African Rice Development Association	Liberia	Rice

