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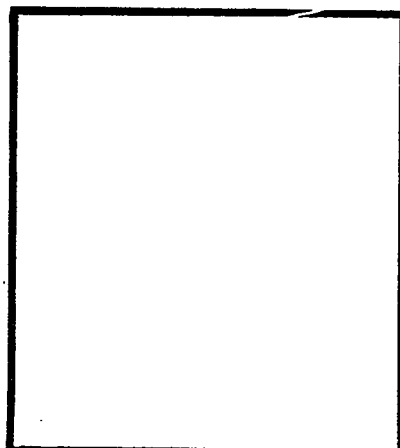
THE PROJECT: Facilitates communication among international and regional centers and institutions of the developed and developing nations via mutually supportive networks. Research, information and technical assistance linkages afford maximum research productivity, and maximum support for the expansion of the lesser-developed countries' research capabilities.

DURATION: 1973-1975

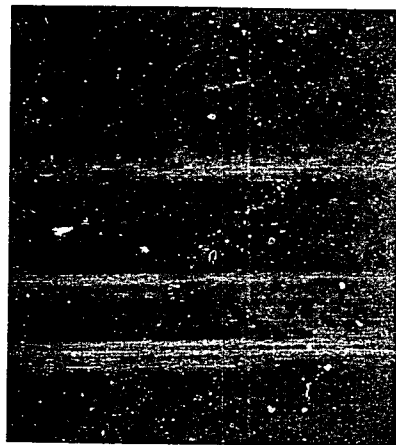
DEVELOPMENTS: Each of the seven publications in this series charts the major linkages within a particular network, and gives the function, services, and fund source for each of the network components. The reports include both AID and regional support projects, and a list of pertinent institutions and their addresses. To improve the situation of the lesser-developed countries farmer, the massing of resources is critical; these publications provide guidance on how useful linkages can be established.

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INTERNATIONAL AGRICULTURAL RESEARCH NETWORK
for
MAIZE



Network Series - Agriculture 1
October 1973

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Office of Agriculture . Technical Assistance Bureau . AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

INTERNATIONAL MAIZE RESEARCH NETWORK

General

The Office of Agriculture, Technical Assistance Bureau (TA/AGR)^{1/}, is responsible within the Agency for fostering the build-up of global networks of mutually supporting research, information and technical assistance activities, in priority areas of agricultural development. These activities provide operating linkages between three sets of institutions: the national research systems of the LDCs, selected research organizations of the more developed countries that have particularly strong capabilities to contribute to the problems being addressed, and selected international or regional research centers. While network building is most advanced for the primary food grains -- rice, wheat and maize, it is also being rapidly developed for other major food crops such as sorghum, millet, barley, potatoes, cassava, yams, sweet potatoes, beans, cowpeas, soybeans, mungbeans, pigeon peas, chickpeas, as well as for selected areas of ruminant livestock.

Agency policy is to encourage and support research linkages and network building with special efforts to link the least developed countries into the networks. Emphasis also will be placed on regional research networks such as the East and West Africa Cereals Projects. This overall policy emphasis on networks reflects the following three sets of facts:

- agricultural research can be expensive, in use of scarce talent and money, and resources required to achieve significant breakthroughs often exceed by far what individual LDCs can muster;
- knowledge building on common problems can proceed at widely separated locations in mutually reinforcing fashion, when supported by suitable information exchange and coordination;
- the great bulk of research facilities and capabilities exists in the developed countries, especially in the U.S.; these can be utilized, through cooperative networking arrangements, to assist LDCs work on their problems and accelerate development of their own national research capabilities; widespread LDC participation, in turn, brings faster and more effective research results.

^{1/} Organizations and their acronyms mentioned in this publication are listed together with addresses on pages 12-14.

Networks have been encouraged to achieve "critical massing" of resources that are required to gain breakthroughs on the important agricultural problems of LDCs. The need for coordinating and integrating all related international research efforts concerning specific crops, crop diseases, pests, weeds, soils, animals, etc., led to A.I.D.'s program stress on strengthening worldwide research networks and research linkages with emphasis on production, quality and income distribution. Maximum research productivity and avoidance of duplicative efforts, as well as maximum support for expansion of the LDCs' own research capabilities, are the goals of this worldwide research network approach. The extreme shortage of LDC skilled manpower and their limited institutional capacity make donor cooperation necessary and call for rapid expansion of existing mechanisms of coordination.

The central purpose of the research networks is, of course, to improve the situations of the mass of LDC farmers. Thus the global problem-solving systems are not complete without effective internal linkages between the LDCs national research institutions and their farmers, causing the available worldwide knowledge to be adapted for local farming needs and actually used on the bulk of each country's farms. Thus the effectiveness of both the external and internal linkages of the national research organizations is critical in transforming worldwide capabilities into LDC farmer capabilities.

This publication is intended to provide guidance on how useful linkages can be established and to suggest agencies that may be contacted to explore new linkages or other relationships.^{1/} The international networks are resources for individual country programs which enable worldwide relevant technology to flow systematically to participating countries. These networks permit countries to become partners in coordinated worldwide endeavors to generate and exchange agricultural technology of mutual interest and value. They provide a powerful set of tools for use in assistance programming. A.I.D. (among other donors) can assist LDCs to establish operating linkages within particular networks, as appropriate to each case, by such measures as good offices, providing information on network activities, financing of training or advisory or other assistance services within the network, or of participation in workshops or conferences, or of exposure visits. Such activities could be integral components of larger projects to assist individual LDCs building of particular agricultural research capabilities, or they could be discrete components of more general efforts to assist agricultural expansion (e.g., financial from technical support or other "umbrella" funds). Information, in the form of reports, pertinent to establishment of the described linkages will be disseminated periodically by TA/AGR, and by international centers and other institutions in the research networks.

^{1/} Two additional related publications are available through AID/Washington. The first is the "Roster of Scientists for the Major Food Crops of the Developing World." It contains biographic citations and listings of the scientists by country of residence and by crop specialty. The second is "Increasing Food Production with Emphasis on High Protein Crops," Technical Series Bulletin No. 8, which gives information on linkages for all of the food crops supported by AID, including maize.

Users of this material are encouraged to comment on the overall content of the bulletin provide supplemental information to improve the network descriptions or fill present gaps in linkages, and to offer suggestions that may prove useful in the contemplated periodic updating of the publication, as well as in developing other network publications planned for the future. Communications should be addressed to the Office of Agriculture, Technical Assistance Bureau, Agency for International Development, Washington, D. C. 20523.

MAIZE RESEARCH NETWORK

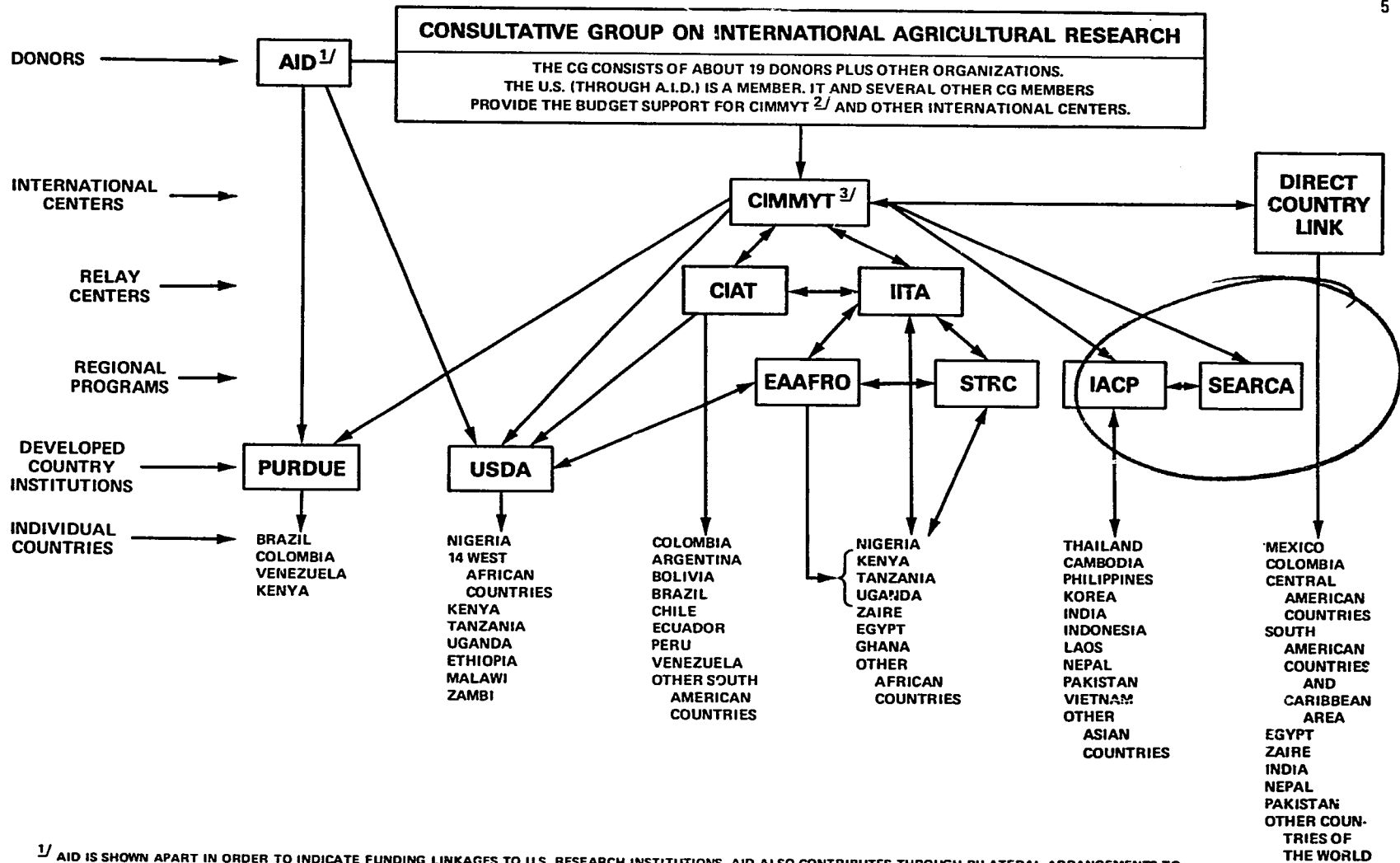
4

The maize network is made up of a number of components - the participating research institutions - and the tie-ins or linkages between them, e.g., joint research, training, advisory services, information and material exchanges. The chart immediately following shows the major linkages and the sources of funds provided by donors in support of the international research network for maize. All linkages are not shown or may be shown somewhat inadequately. This is particularly true with reference to links to and within individual countries. Moreover, since this is a dynamic system, changes can be expected in the network over time, resulting in new components being added which may require different linkages. Internal linkages within LDCs are not dealt with at all.

The basic information on the maize network usually needed by operational personnel is presented in descriptive form in the table immediately following the chart. The "Components" column refers to the individual research institutions or systems which are working towards development of the technology needed for utilization by LDCs. CIMMYT is the hub of the maize network; other international centers -- CIAT and IITA, the regional Inter-Asian Corn Program (IACP), and other regional organizations such as EAAFR0, STRC, and SEARCA make up additional components. Maize research institutions or programs in both the developed and less developed countries constitute other integral components in the network. Other columns show: the "Functions" performed at each unit in the network; "Services Available" from each; and how each unit is financed. Other financing sources may be sought for particular LDC linkages now lacking that may be deemed essential.

The next section views the maize network in terms of A.I.D. support. Again, particularly at the Mission level, the information may be incomplete and supplemental information from the field will be appreciated.

Finally, to facilitate communication, a list of the various institutions mentioned and their addresses is appended at the end of this publication.



^{1/} AID IS SHOWN APART IN ORDER TO INDICATE FUNDING LINKAGES TO U.S. RESEARCH INSTITUTIONS. AID ALSO CONTRIBUTES THROUGH BILATERAL ARRANGEMENTS TO INDIVIDUAL COUNTRY PROGRAMS, AND TO THE SECONDARY CENTERS SHOWN. OTHER DONOR MEMBERS OF CG HAVE CORRESPONDING ADDITIONAL FUNDING LINKAGES.

^{2/} FOR 1973, THESE ARE CANADA, FORD FOUNDATION, GERMANY, ROCKEFELLER FOUNDATION, UNDP AND WORLD BANK. OTHER CG DONORS INCLUDE BELGIUM, DENMARK, FRANCE, JAPAN, KELLOGG FOUNDATION, NETHERLANDS, NORWAY, SWEDEN, SWITZERLAND, UNITED KINGDOM. ANY CG MEMBERS ARE POTENTIAL FINANCIERS OF OPERATING LINKAGES WITHIN THE NETWORK.

^{3/} THE LINKS BETWEEN CIMMYT AND THE INDIVIDUAL COUNTRIES TAKE THE FORM OF: INFORMATION AND MATERIALS (E.G., SEED) EXCHANGE (INCLUDING SEMINARS AND WORKSHOPS); JOINT RESEARCH; ADVISORY SERVICES; AND, TRAINING. THERE ARE LINKS OF A CORRESPONDING NATURE -- IN MOST INSTANCES LESS COMPREHENSIVE THAN FOR CIMMYT IN THE CASE OF MAIZE -- BETWEEN THE RELAY CENTERS, REGIONAL PROGRAMS AND DEVELOPED COUNTRY INSTITUTIONS NOTED, AND THE INDIVIDUAL COUNTRIES.

INTERNATIONAL MAIZE RESEARCH NETWORK

COMPONENTS	FUNCTIONS	SERVICES AVAILABLE	SOURCE OF FUNDS
CIMMYT - INTERNATIONAL CENTER FOR MAIZE AND WHEAT IMPROVEMENT, El Batan, Mexico	Serves as hub of international network; multidisciplinary production-oriented core research; outreach to national research and production programs; training; consultation.	Source of improved seed; technical information; consultant services; training; also, support in national research and production programs; and, assistance with workshops and seminars.	Consultative Group for core (operating) budget; bilateral arrangements for outreach and special projects.
CIAT - INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE Cali, Colombia	Serves as maize relay center to CIMMYT for Latin America; has limited maize research program; provides some training and consultation.	Basically the same as from CIMMYT, but more restricted. Requests, if not handled directly, would be referred to CIMMYT. Services limited to Latin American countries.	- do -
IITA - INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE Ibadan, Nigeria	Serves as maize relay center to CIMMYT for Africa, has limited maize research program and facilities for training and consultation.	Basically the same as from CIMMYT, but more restricted. Requests, if not handled directly, would be referred to CIMMYT. Services limited to African countries.	- do -

INTERNATIONAL MAIZE RESEARCH NETWORK

7

COMPONENTS	FUNCTIONS	SERVICES AVAILABLE	SOURCE OF FUNDS
IACP - INTER-ASIAN CORN PROGRAM Bangkok, Thailand	Serves as maize relay center to CIMMYT for South and Southeast Asia; has limited maize research program and facilities for training and consultation.	Basically the same as from CIMMYT. Requests, if not handled directly, would be referred to CIMMYT. Services limited to South and Southeast Asia.	Rockefeller Foundation; Thailand.
EAAFR0 - EAST AFRICAN AGRICULTURE AND FORESTRY RESEARCH ORGANIZATION Nairobi, Kenya	Addresses research needs of the East African community nations; strengthens national research programs.	Technical support based on research conducted; arrangements for coordinated research; good library facilities.	Member countries, and outside donors - primarily U.S. and U.K.
STRC - Scientific, Technical and Research Commission, OAS Lagos, Nigeria	Encourages and sponsors research on important problems of participating countries, including agriculture.	Assistance for research on major cereals, including maize, and for complementary areas; technical information; sponsorship of seminars; assistance in selection of candidates for training; publishing reports.	OAS budget derived from contributions by participating countries; support for specific projects by outreach donors, including U.S., France and U.K.

INTERNATIONAL MAIZE RESEARCH NETWORK

COMPONENTS	FUNCTIONS	SERVICES AVAILABLE	SOURCE OF FUNDS
<p>SEARCA - SOUTHEAST ASIAN REGIONAL CENTER FOR GRADUATE STUDY AND RESEARCH IN AGRICULTURE Los Banos, Philippines</p>	<p>Research, training and consultation; support to research and production programs, and agri-business development.</p>	<p>Consultant services, training, assistance with workshops and seminars.</p>	<p>AID, Philippines</p>
<p>PURDUE UNIVERSITY Lafayette, Indiana</p> <p>(Discoverer of value of opaque-2 in improvement of protein)</p>	<p>Research directed toward increased level and improvement in quality of protein in the grain; nutritive evaluation of grain; training; consultation.</p>	<p>Assistance in research, production as related to protein level and quality in the grain; source of improved germplasm, information; advanced research training to the Ph.D. degree.</p>	<p>State Appropriations; AID</p>
<p>AGRICULTURAL RESEARCH SERVICE (USDA) Beltsville, Maryland and cooperative State Research Programs (primarily at Land Grant Universities)</p>	<p>Maintenance of germplasm; multidisciplinary research to meet U.S. needs in production, handling, storage, and utilization; cooperative USDA State research programs.</p>	<p>Source of germplasm, technical information, consultant services, training for advanced degrees.</p>	<p>Federal and State appropriations; AID.</p>

INTERNATIONAL MAIZE RESEARCH NETWORK

9

COMPONENTS	FUNCTIONS	SERVICES AVAILABLE	SOURCE OF FUNDS
LESS DEVELOPED COUNTRY AND OTHER DEVELOPED COUNTRY RESEARCH INSTITUTIONS AND PROGRAMS: Notably - India, Pakistan, The Philippines, Thailand, Nepal, Indonesia, Nigeria, Kenya, Tanzania, Zaire, Egypt, Mexico, Colombia, Argentina, Brazil, Chile, Peru, Venezuela and the Central American countries.	Development of technology required by the country concerned, training, liaison with extension	Source of germplasm, technical information, consultant services; training and management.	Country appropriations; support for LDC programs from outside donors such as AID, UNDP, FAO, IBRD, Ford and Rockefeller Foundations, etc.

AID SUPPORTING PROJECTSTA/AGR Supporting ProjectsResearch

1. Improvement of Protein Quality in Maize, Purdue University
2. Water Management Research in Arid and Sub-Humid Lands (2 projects), Colorado State University (Asia) and Utah State University (IA)
3. Agronomic-Economic Research on Tropical Soils, North Carolina State University
4. Soil Fertility Requirements to Attain Efficient Production on Extensive, Deep Well-drained, but Relatively Infertile Soils of the Humid Tropics, Cornell University
5. Control of Weeds, Oregon State University

General Technical Services

1. Budget support to CIMMYT
2. Pest Management and Related Environmental Protection, University of California
3. Fertilizers, Technical Assistance, Survey, Training and Consultations, T.V.A.
4. Seed Program and Industry Development, Mississippi State University
5. Plant and Seed Materials for Development of Potential Crops, USDA
6. Technical Assistance in Food Grain Drying, Storage, Handling and Transportation, Kansas State University

TA/DA Supporting Projects

Support to SEARCA through a contract with the Harvard Business School, to develop commodity systems approach to maize involving rationalization and coordination of agro-business/production linkages and of movement of inputs and outputs through the system. This contract specifically involves the Philippines, Thailand and Indonesia.

Regional Bureau Supporting Projects

Latin America

1. Budget support to CIAT
2. Grant to the Castellar Graduate School (Argentina) for advanced training in agriculture, covering, among other subjects, crop improvement including maize.
3. Soil Fertility Project, North Carolina State University (contract) — provides cooperative research support to national programs working on fertility problems in maize and other crops in Latin America.

Africa Bureau

1. Budget support to IITA
2. East African Food Crops Research Project which provides technical and research assistance to Kenya, Tanzania and Uganda. Research emphasis is principally on maize. Costs are met in part by AID through a PASA with the USDA and in part by the principal cooperating countries through the regional sponsoring organization known as EAAFRRO (East Africa Agriculture and Forestry Research Organization).
3. West African Major Cereals Project -- involving technical and research assistance to 16 cooperating countries, most notably Nigeria, under the sponsorship of the regional organization known as the STRC (Scientific Technical Research Commission). Principal emphasis is on the development of improved varieties of maize and cultural practices. Costs are met by AID under arrangements involving the USDA and the STRC.

Mission Level Support

Support is provided to strengthen country-level maize research programs and supporting activities such as training. Other activities supported at this level are international testing and seed exchange; cooperative production and/or research programs; and seminars and workshops combined with exchange of information.

MAILING ADDRESSES OF INSTITUTIONS MENTIONED

AID Agency for International Development
Department of State
Washington, D. C. 20523

CG Consultative Group on International Agricultural Research
International Bank for Reconstruction and Development
1818 H Street, N.W.
Washington, D. C. 20433

CIAT Centro Internacional de Agricultura Tropical
(International Center of Tropical Agriculture)
Apartado Aereo 67-13
Cali, Colombia

CIMMYT Centro Internacional par el Mejoramiento de Maiz y Trigo
(International Center for Corn and Wheat Improvement)
Apartado 6-641, Londres 40
Mexico 6, D. F. Mexico

EAAFR0 East African Agriculture and Forestry Research Organization
P. O. Box 30148
Nairobi, Kenya

FAO Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla
00100 Rome, Italy

FORD The Ford Foundation
320 East 43rd Street
New York, New York 10017

IACP Inter-Asian Corn Program
The Rockefeller Foundation
G. P. O. Box 2453
Bangkok, Thailand

IBRD International Bank for Reconstruction and Development
1818 H. Street, N.W.
Washington, D. C. 20433

IITA International Institute of Tropical Agriculture
Oyo Road
P. M. B. 5320
Ibadan, Nigeria

PURDUE Purdue University
International Programs in Agriculture
Lafayette, Indiana 47907

ROCKEFELLER The Rockefeller Foundation
111 West 50th Street
New York, New York 10020

SEARCA Southeast Asian Regional Center for Graduate Study and Research in Agriculture
College, Los Banos
Laguna, Philippines

STRC Scientific and Technical Research Committee
 Organization of African Unity
 Lagos, Nigeria

TA/AGR Office of Agriculture
 Technical Assistance Bureau
 Agency for International Development
 Washington, D. C. 20523

TA/DA Office of Development Administration
 Technical Assistance Bureau
 Agency for International Development
 Washington, D. C. 20523

UNDP United Nations Development Programs
 799 United Nations Plaza
 New York, New York 10017

USDA U. S. Department of Agriculture
 Agricultural Research Service
 Washington, D. C. 20250