Consultative Group on International Agricultural Research

CGIAR

Study Paper Number 26

International Agricultural Research

A Database of Networks

Donald L. Plucknett
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Selcuk Ozgediz

International Agricultural Research

A Database of Networks

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Also of related interest

Warren C. Baum, *Partners against Hunger: The Consultative Group on International Agricultural Research*

Jock R. Anderson, Robert W. Herdt, and Grant M. Scobie, *Science and Food: The CGIAR and Its Partners*

1985 Annual Report of the Consultative Group on International Agricultural Research

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At its annual meeting in November 1983 the Consultative Group on International Agricultural Research (CGIAR) commissioned a wide-ranging impact study of the results of the activities of the international agricultural research organizations under its sponsorship. An Advisiory Committee was appointed to oversee the study and to present the principal findings at the annual meetings of the CGIAR in October 1985. The impact study director was given responsibility for preparing the main report and commissioning a series of papers on particular research issues and on the work of the centers in selected countries. This paper is one of that series.

Because of the informality and to present the results of research with the least possible delay, the manuscript has not been prepared in accordance with the procedures appropriate to formal printed texts, and the World Bank accepts no responsibility for errors.

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Preface

Networking became a popular way of promoting research in the 1970s and 1980s. Networks are particularly common in the agricultural sciences, an indication of the interdisciplinary nature of agricultural research and development as well as the widespread recognition of the benefits of collaboration by scientists and donors. This database covers only international networks related to agricultural research; collaborative research efforts on a national scale are not covered.

Networks are now recognized as new organizational structures that cater to the needs of individuals and institutions. One of the attractions of networks is that they are relatively fexible, usually informal ogranizations, that can facilitate research and the implementation of work plans. Networking can bypass some of the inert qualities of many bureaucracies.

Networks can be visualized in various ways, but we focus on networks that unite independent individuals or institutions with a shared purpose or goal and to which its members contribute resources. In the networks outlined in this database, network members also exchange materials, technologies, and/or information.

Four major types of networks are recognized: information exchange, material exchange, scientific consultation, and collaborative research networks. Information exchange networks disseminate data without conducting joint research. Material exchange networks are concerned primarily with shifting germplasm or machinery prototypes between cooperators. In scientific consultation networks, participants agree to some minor adjustments to their ongoing research projects. In collaborative research networks, members jointly plan research and adopt common methodologies. In the table of contents, networks are designated by type, however, such a classification can only be approximate. Furthermore, some networks span more than one type.

This database was organized to facilitate the writing of a book, ***Networking in International Agricultural Research,*** which is being published by Cornell University Press in 1990. Readers are urged to consult the book for more information on the history, organization, management, principles, and problems of networking. Not all the items in the database could be incorporated in the book, however, so it is reproduced here for those who seek more information on specific networks.

The database was assembled with information garnered from field visits, publications, and unpublished reports. Whenever possible, data sheets on each network were sent to coordinators for verification. Nevertheless, networks often evolve quickly, and information can become quickly outdated. Also, neither the

authors, nor their employers, can vouch for the accuracy of the information contained in the database.

For each network, information was sought on about 30 items, ranging from funding sources to whether the network operates training courses. Immediately following the network's name and acronym, if any, information is provided on a contact person for readers interested in securing more data on the network. The focus section outlines the main purposes and goals of the network. For Year Started we have selected the year in which agreement was reached to establish the network, not necessarily when it began operations. The Lead Institution is usually, but not always, the organization the coordinator is affiliated with. A lead institution does not dominate the network, but rather is well placed to catalyze efforts and provide important assistance to members requiring support.

In the sections dealing with Governance Mechanism and Organization Structure, we summarize how the network has implemented ways to establish policy and coordinate activities. Here we identify different committees or advisory bodies associated with networks and describe briefly their functions. Information on Network Expenditures/Budget is often difficult to come by. When available, budget figures refer to operating costs of the network exclusive of costs carried by member institutions. Thus, salary and technical support covered by the members' institutions are not included. The section on Funding Sources refers mostly to external donors.

The information on Network Publications includes only publications put out by the network itself. Most networks publish a newsletter; some of the larger, more complex networks also issue reports and workshop proceedings. In Network Training we indicate training courses operated by the network. To accelerate progress, particularly in the initial stages, some networks have found it necessary to operate highly focused, short courses to bridge expertise gaps among participants. In Indicators of Impact/Performance only some of the major accomplishments are highlighted. Many networks are relatively new, so no products may yet be identifiable. Most networks make some contributions, if only to facilitate the sharing of information. More research is needed on how to evaluate networks and to identify criteria that should be used in making judgements on their effectiveness. The Remarks section is somewhat subjective. This database does not attempt to evaluate networks, but some positive and negative experiences of the network, however imprecise or open to various interpretations, are offered to enrich the database.

Finally, we wish to emphasize that the database is far from complete. For some networks, information is reasonably extensive, but for others no feedback was received. To save space, only items where information was available are included in the network profiles; thus items covered will vary somewhat between networks.

Contents

1 Information exchange network
2 Material exchange network
3 Scientific consultation network
4 Collaborative research network

* No longer operational

ACIAR Forestry Research and Information Network

Contact Person and Address: Director, Australian Centre for International Agricultural Research (ACIAR), GPO Box 1571, Canberra, ACT 2601, Australia. Phone: (062) 48 8588. Telex: 62419.

Focus: Develop guidelines for rational and effective use of Australian tree species, particularly for fuelwood, in developing countries. Aims include:

(a) collect representative seed samples of potentially useful tree species from Australia's extensive and unique genetic resources. Better known, and already widely dispersed trees native to Australia include species of ***Eucalyptus, Casuarina, and Acacia***. Program will also assess potential of lesser known species.

(b) evaluate and characterize these species under a range of conditions in developing countries, assess in detail the potential adaptability of selected species specifically for high stress environments such as semi-arid, saline, and calcareous conditions.

(c) document the characteristics of selected species with special reference to propagation and to treatment and management under cultivation.

(d) encourage adoption of this technology by collaborating in forestry research projects with developing countries.

Year Started: 1985

Lead Institution: ACIAR

Member Institutions/Individuals: Information exchange recipients in China, Kenya, Thailand, and Zimbabwe.

Region: Currently Africa and Asia but may expand to include developing countries in all regions.

Countries in Network: China, Kenya, Thailand, and Zimbabwe.

Governance Mechanism: ACIAR Board of Management decided to establish the network and presumably will oversee its development, at least initially.

Early Leadership: ACIAR

Current Leadership/Coordination: Dr. John Turnbull, Coordinator, ACIAR Forestry Research Program (as of 1985).

Organizational Structure: Network coordinator collates information pooled by participants. Participants also respond to direct requests from each other and are responsible for nominating a correspondent to facilitate liaison between each other. Decentralized organizational structure with hub, spokes, and rim.

Number of Network Staff (FTE): One part-time coordinator.

Funding Source(s): Appears to be fully funded by ACIAR.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Network Publications: Newsletter twice a year.

Network Training: No

Remarks: This is really an information exchange network which may evolve into a scientific consultation or collaborative research network. The network is essentially an outreach service of ACIAR's Forestry Research Program.

References: Forestry network established. ***ACIAR Newsletter*** (Australian Centre for International Agricultural Research) 6, March-May 1985, p. 1.

File date: 21 November 1987

AFRENA (Agroforestry Research Networks for Africa)

Contact Person and Address: Mr. R.B. Scott, International Council for Research in Agroforestry (ICRAF), P.O. Box 30677, Nairobi, Kenya. Phone: 29867. Cable: ICRAF.

Focus: Multipurpose trees for such uses as fuelwood, fodder, soil improvement, soil protection, and as a shade crop. Aims are to diagnose land use problems and design agroforestry technologies to overcome the problems, develop such technologies through research, select suitable tree species, and arrange training sessions. Overall goals are to (1) strengthen national capabilities to conduct agroforestry research addressed to needs of smallholders, and (2) collaborate with national institutions in Africa to generate technologies for addressing identified constraints to production and sustainability. Composed of four subnetworks covering different ecological zones:

Southern Africa Miombo Ecozone Program: Savanna 900-1500 m altitude, 600-1500 mm annual rainfall. Agroforestry technologies focusing on soil fertility, fuelwood, and fodder.

Sudano-Sahelian Zone: Linking up with on-going SAFGRAD farming systems research teams and tie-in with ICRISAT Sahelian Center to collaborate in the development of agroforestry technologies for the zone.

Humid Zone of West Africa: Intention is to expand this from a one-country collaborative effort in the southern forest zone of Cameroon with the Institut de Recherche Agronomique (IRA). Expansion is anticipated to include Ghana, Nigeria, and Cte d'Ivoire by 1990. Specific aims include: multipurpose trees for alley farming, improved fallow, and home gardens; establishment of germplasm/seed production center for indigenous and exotic species.

East African Highlands Program: Develop multipurpose tree species to enhance food production for small-scale farmers by controlling soil erosion, maintaining fertility, and increasing fodder production.

Year Started: 1985 (planning and research formulation). East Africa and Southern Africa components of AFRENA planted their first experiments in late 1987.

Lead Institution: ICRAF, SACCAR

Region: Africa

Countries in Network: Thirteen in the four regional subnetworks.

Southern Africa Miombo Ecozone Program: Malawi, Tanzania, Zambia, and Zimbabwe (Mozambique and Angola expected to join, funds permitting).

East African Highlands Program: Kenya, Rwanda, Burundi, and Uganda.

Humid Zone of West Africa: Cameroon (by 1990 Nigeria, Ghana, and Cote d'Ivoire may be included).

Sudano-Sahelian Zone: Burkina Faso, Benin, Niger, and Cameroon (northern part)--more countries are likely to participate.

Number of Network Sites:
AFRENA-East Africa: 4
AFRENA-Southern Africa: 3 (Chitedze, Malawi; Msekera, Tanzania; Ukiriguru, Zambia; site in Zimbabwe to be established).

Early Leadership: ICRAF

Current Leadership/Coordination: ICRAF

Organizational Structure:
AFRENA is composed of four subnetworks:
AFRENA-Sahel
Southern Africa Miombo Ecozone Program: (ICRAF coordinator with assistance of ILCA and ICRISAT).
East African Highlands Program: (ICRAF coordinator with assistance of ILCA and IITA).
AFRENA-West Africa: (ICRAF will work closely with ILCA on this network).

Number of Network Staff (FTE):

East African Highlands Program: Zonal coordinator and a multidisciplinary team of four ICRAF scientists is being recruited. Dutch government has seconded a young scientist to this program and a request is with the Belgian government to do the same.

Southern Africa Miombo Ecozone Program: ICRAF will place a zonal coordinator and four senior scientists in the region. Two scientists from each country are seconded to the program.

Network Expenditures/Budget: Projected operating budget for first 5 years is US $4.6 million.

East African Highlands Program: An agreement was signed with USAID in September 1986 for support of this program at a level of $800,000/yr for 5 years.

Southern Africa Miombo Ecozone Program: CIDA and IDRC provided approximately US $600,000 for planning and training from the end of 1985-mid 1987. In 1987, a contract was signed between CIDA and ICRAF for 5-year implementation phase at a level of US $1 million/yr. SAREC is providing US $200,000/yr for Zambia's participation.

Sudano-Sahelian Zone: IFAD provided $80,000 for training. Request into IFAD for a further $700,000.

Funding Sources: See previous item. Donors include World Bank, USAID, IDRC, CIDA, SAREC, and IFAD.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: In the case of research planning for AFRENA-Southern Africa, ICRAF worked with National Agroforestry Planning Committees and Task Forces set up in each participating country. Subsequently, multidisciplinary Task Forces, in collaboration with ICRAF scientists, have set research agendas and priorities.

Network Publications: No. Information updates on AFRENA are issued mainly through ichors Newsletter.

Monitoring Tours: Since 1988.

Workshops/Conferences: AFRENA-Southern Africa held workshop in Harare, Zimbabwe, in September 1986.

Network Training: Yes

Indicators of Impact/Performance:

Southern Africa Miombo Ecozone Program: Land systems in the savanna ecozone have been described and delineated. Participants have also identified major constraints to agricultural production and sustainability. Priorities have been established, multidisciplinary teams of scientists have been trained, national agroforestry steering committees have been formed, and a zonal steering committee under the chairmanship of SACCAR has been set up (the zonal program is an official SADCC project).

East African Highlands Program: Planning completed, priorities agreed upon, initial training completed, technologies and tree species selected, seedlings under production. Field experimentation to start in 1988.

Remarks: Designed to be a collaborative research network.

References:

Ngugi, David N. 1987. The agroforestry research networks for Africa (AFRENA) programme: southern Africa. ICRAF Newsletter 20:3-4, August.

Nugugi, David N. 1988. Agroforestry research networks for Africa: eastern and southern Africa. In: ***Eastern and Southern Africa Network Coordinators' Review: Proceedings of a Workshop held at Nairobi, Kenya, 9-12 May 1988***, D.G. Farris and A.D.R. Ker (Editors), pp. 57-63, IDRC/CRDI/CIID, Ottawa.

File date: 25 January 1989

African Alley Farming Network

Contact Person and Address: International Institute of Tropical Agricultural (IITA), PMB 5320, Ibadan, Nigeria. Phone 400300.

Focus: Screening of multipurpose trees, collaboration in training activities, and development of guidelines for standardized minimum data sets for agroforestry research.

Year Started: Proposed in March 1986 at the ILCA/IITA workshop on alley farming.

Region: Africa

Governance Mechanism: A provisional Steering Committee elected at the ILCA/IITA workshop on alley farming.

Current Leadership/Coordination: Set up to be operated by national programs in Africa; ILCA and IITA to facilitate in fund raising efforts.

References:

Neate, Paul. 1987. Broader network proposed. ILCA Newsletter 6(1):7, January.

File date: 22 November 1987

AGLN (Asian Grain Legumes Network)

Contact Person and Address: D.G. Faris, AGLN Coordinator, Legumes Program, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh 502 324, India.

Focus: Facilitate interchange of materials and information concerning goundnut, chickpea, and pigeonpea between grain legume scientists at ICRISAT and in Asia. Objectives include:

(a) produce a directory of AGLN cooperators,
(b) operate an information bank for the cooperators,
(c) support identification of adapted grain legume lines and the appropriate agronomy for their cultivation in each AGLN country through such means as trial networks,
(d) promote training of legume scientists from AGLN countries, and
(e) foster special research projects to support AGLN.

Year Started: 1986

Lead Institution: ICRISAT

Member Institutions/Individuals: Country national programs

Region: Asia

Countries in Network: Bangladesh, Burma, India, Indonesia, Nepal, Pakistan, Philippines, China, Sri Lanka, and Thailand.

Legal Status/Formal Agreements: Memoranda of Understanding signed between ICRISAT and agricultural research programs in Bangladesh, Burma, China, Nepal, and Sri Lanka to cover AGLN and other research-related activities. As of March 1987, Memoranda of Understanding being worked out with Indonesia.

Early Leadership: ICRISAT

Current Leadership/Coordination: Don G. Farris, ICRISAT.

Organizational Structure: Proposal calls for certain ICRISAT scientists to serve as experts for their respective crops in specific network countries, and visit those countries at least once a year to maintain close contact with national program scientists.

Number of Network Staff (FTE): 4.0 in 1988 (up from 1.5 in 1986).

Funding Sources: ICRISAT provides much support. Asian Development Bank has agreed to fund part one of Assistance to National Programs associated with AGLN--3 year funding in the amount of US $350,000 to cover AGLN activities in Bangladesh, Burma, Nepal,

and Sri Lanka. AIDAB has also provided a grant of Australian $50,000 to CGIAR centers to support cooperative programs between ACIAR and ICRISAT in Indonesia and Thailand. This grant will fund collaborative work on peanut stripe virus in Indonesia, and for work on pigeonpea utilization in Indonesia and Thailand.

Common Network Plan/Strategy: Yes. Directions laid out in the recommendations put forward by the Asian Regional Program Meeting held at ICRISAT in December 1985. Strategies include:

(a) identify and utilize links with donor groups in the region,
(b) identify yield limiting stresses and suggest control measures,
(c) collect and preserve germplasm,
(d) participate in genotype/environment interaction studies on grain legumes,
(e) conduct socioeconomic research on grain legumes,
(f) support joint special research projects of a basic nature, and
(g) collect agrometeorological data to identify agroecological needs.

Common Research Methodology: Yes

Planning Procedures: Yes

Network Publications: Yes. AGLN Cooperators Report No. 1.

Monitoring Tours: Yes

Workshops and Conferences: Yes

-- Peanunt Stripe Virus Coordinators Meeting, June 1987, Indonesia.
-- Workshops on Integrated Management of Legume Pests, August 1987 (Thailand) and September 1987 (Indonesia).
-- AGLN Chickpea Coordinators Work Plan Meeting, August 1987.
-- Review and Work Plan Meetings in Bangladesh, Burma, China, Indonesia, Nepal, Sri Lanka, and Thailand during 1987 and 1988.

Network Training: Yes. AGLN participants are encouraged to take courses offered by ICRISAT's Fellowships and Training Program. In addition, the following special training courses are planned by the network during 1988:

-- In-country Training Course on Chickpea, Pigeonpea, and Lentil (Nepal, March 1988).
-- Groundnut Virus Identification Training Course, Indonesia, July 1988.
-- Analytical Techniques for Evaluating Grain and Food Quality of Legumes, ICRISAT, August 1988.

-- Training Course on Integrated Pest Management of Legumes, ICRISAT, October 1988.

Indicators of Impact/Performance: Network has just begun so it is difficult to assess impact. Donor organizations have been contacted in all AGLP countries and proposals for collaboration suggested.

Remarks: A top down approach. Has characteristics of a scientific consultation network. A multipurpose commodity network with international nursery trials, agronomy trials, and farming systems research. Support from NARSs and donor agencies has been disappointing.

References:

Farris, D.G. 1986. ***The Asian Grain Legume Program: Progress and Outlook.*** ICRISAT, Patancheru, mimeo, 42 pp.

ICRISAT. ***An Invitation to Become a Cooperator in the Asian Grain Legumes Network (AGLN) Groundnut, Chickpea, and Pigeonpea of the ICRISAT Legumes Program.*** ICRISAT, Patancheru, leaflet.

ICRISAT. 1987. AGLN Cooperators Report No. 1, Legumes Program, ICRISAT, Patancheru, mimeo, 38 pp.

Gowda, C.L.L. and D. McDonald. 1987. ICRISAT's Asian Grain Legume Network in Asia and the Pacific Region. Report of the Fifth Meeting of the Regional Coordinating Committee of FAO/UNDP Project RAS/82/002, pp. 347-355.

File date: 28 January 1989

Animal Traction Research Network

Contact Person and Address: Dr. Michael R. Goe, Animal Scientist, International Livestock Center for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia. Phone:613215. Telex: 980-21207 ILCA ET. Cable: ILCAF.

Focus: The overall goal of the network is to improve and extend the use of animal traction in Sub-Saharan agriculture in order to increase agricultural production and raise rural income. The network will link organizations and individuals with research, development and training interests in the field of draft animal power. Specific goals include:

(a) facilitate exchange and awareness of both existing and newly written information, including production and circulation of technical reports in English and French,
(b) stimulate improved liaison and cooperation within and between African countries on all aspects of animal power use,
(c) increase the level of technical knowledge and understanding of decision makers, researchers, extension personnel and farmers about the potential of draft animal power,
(d) encourage more widespread field evaluation of non-conventional animal traction uses that have been successful in some African countries, including water-lifting, milling, oil seed pressing, land and water management, and forestry uses, and
(e) strengthen animal traction research in NARS through research collaboration, logistical support, and strategic technical training.

Year Started: 1988

Lead Institution: ILCA

Number of Individuals Involved: 750 individuals/organizations receive the network newsletter.

Region: Sub-Saharan Africa.

Countries in Network: Individuals in 25 countries in West, East and southern Africa have expressed interest in the network.

Number of Network Sites: Four in 1989, increasing to eight to ten in 1990.

Legal Status/Formal Agreements: Constitution to be formulated by Steering Committee, otherwise according to agreements between ILCA and the individual countries.

Governance Mechanism: Steering Committee to be formed from NARSs.

Early Leadership: ILCA

Current Leadership/Coordination: ILCA, with some NARS liaison.

Organizational Structure: ILCA to initially coordinate network through its Animal Traction Thrust. Later, Steering Committee to be composed of individuals from NARSs who have national animal traction programs in place. As activities increase and network expands, it is envisaged that regional offices will be established.

Number of Network Staff (FTE):

Current staff on ILCA budget
-- 1 senior network scientist (animal scientist) at $90,000/yr

Proposed staff on EEC funding (year 1, 1989)

A. Network coordination/central research
-- 1 senior network scientist (animal scientist) at $90,000/yr
-- 1 bilingual secretary ($11,000/yr)
-- 2 research/technical assistants ($12,000/yr)
-- casual labor ($10,000/yr)
Subtotal A Annual staff costs: $123,000

B. NARSs collaborative research (initially in four countries)
-- bilingual secretary ($5,000 x 4=$20,000)
-- technical assistants, two per country ($5,000 x 8=$40,000)
Subtotal B annual staff costs:$60,000

Total annual staff costs: $183,000/yr

Network Expenditures/Budget:

Physical Inputs (year 1 of EEC funding, 1989)
A. Network coordination/central research
-- computer equipment, office furniture, vehicles, research equipment, animals, and miscellaneous ($87,500)

B. NARS collaborative research (initially in four countries)
-- physical inputs (computer equipment, office furniture, vehicles, research equipment, misc. ($162,000)

C. Transport charges for purchase of capital items
-- @ 25% of FOB ($62,400)
Total physical inputs=$311,900

Nonphysical Inputs (year 1 of EEC funding, 1989)
A. Total staff costs outlined above ($183,000/yr)

B. Annual meetings ($40,000)
Conferences ($60,000)
Subtotal B annual nonphysical inputs ($100,000/yr)

C. Supplies and services (initially four countries)
-- local travel ($30,000)
-- field and equipment supplies ($60,000)
-- office supplies ($30,000)
Subtotal C supplies and services ($120,000)

D. International travel for network coordinator ($20,000)

E. Overhead required by CGIAR
-- @ 18% of nonphysical inputs $76,100
Total nonphysical inputs ($499,100)

Total physical and nonphysical inputs
$811,000 (year 1 of EEC funding, 1989)
Estimated total cost of $2,182,200 over 4 years

Funding Sources: Currently from ILCA budget. Funding being sought from EEC.

Common Network Plan/Strategy: Yes. On-farm trials to be undertaken by NARS and other collaborators.

Common Research Methodology: Yes, where developed.

Planning Procedures: with NARSs to establish the Network, support newsletter, elect steering committee, organize first workshop and identify relevant research projects.

Network Publications: First issue of Animal Traction Research Network Newsletter published December 1988. This bilingual newsletter is to be published quarterly. Other publications will include proceedings of meetings and conferences, relevant documents and research and training manuals.

Monitoring Tours: Twice yearly to each participating country.

Workshops and Conferences: Annual meetings for key collaborators proposed to discuss progress, review techniques, and exchange information.

Network Training: Yes. First training course planned for ten African scientists in 1990.

Indicators of Impact/Performance:

-- newsletter now being published
-- documentation service begun in 1989, i.e. collection compilation, translation and dissemination of key documents
-- planning meetings held in 1989 for establishment of collaborative research proposals
-- steering committee elected in 1989

Remarks: By 1993, newsletter is slated to become user supported, network to organize yearly conferences held on selected topics, NARS collaborative research to increase, and activities to become organized on a regional basis. All costs are estimated for year 1 (1989) of the network's full operation, except for most physical inputs. Nonphysical input costs will increase yearly over the following 3 years as the network expands to include more NARS collaborators and research sites. Intended that eventually network will become organized on a regional basis. Appears to be an information exchange network, at least at this stage, with prospects of evolving towards a collaborative research network.

References:
Animal Traction Research Network Newsletter, No. 1, December 1988.

File date: 28 January 1989

ARFSN (Asian Rice Farming Systems Network)

Contact Person and Address: Dr. Virgilio R. Carangal, Head, Rice Farming Systems Program, International Rice Research Institute (IRRI), P.O. Box 933, Manila, Philippines. Cable: RICEFOUND MANILA. Telex: 40890 RICE PM.

Focus: Rice farming systems in Asia. Very diverse components--cropping patterns; livestock integration in rice farming (sites in Indonesia, India, and Pakistan); varietal testing (soybean, mungbean, maize in Philippines, Thailand, Indonesia); long-term fertilizer and cropping pattern trials; rice weeds; farm implements. Rice farming systems in Asia in different on-farm key research sites and major component problems such as cropping systems research in eight sites (Philippines, Indonesia, India, Thailand, and Bangladesh); women in rice farming in ten sites (Indonesia, Thailand, Bangladesh, Nepal, and Philippines); crop-animal systems research in seven key sites (Philippines, Indonesia, Thailand, Nepal, and China); rice-wheat cropping systems (China, Nepal, India, Bangladesh, and Philippines); rice-fish farming in six key sites (China, Philippines, Indonesia, Thailand, Bangladesh, and India); impact of cropping/farming systems research (Philippines, Indonesia, Nepal, and Bangladesh); varietal testing of upland crops (mungbean, cowpea, peanut, soybean, maize, and sorghum) in nine countries; long-term cropping pattern testing in three countries (China, Indonesia, Bangladesh) and farm implements for intensive cropping in six countries.

Year Started: 1975

Lead Institution: International Rice Research Institute (IRRI), Los Banos, Philippines.

Member Institutions/Individuals: 42 institutions

Number of Individuals Involved: 500

Region: Asia and Madagascar

Entities in Network: Bhutan, Vietnam, China, Taiwan, China, Republic of Korea, Burma, Bangladesh, Sri Lanka, Indonesia, Thailand, Philippines, Nepal, Malaysia, India, and Malagasy.

Number of Network Sites: 30

Legal Status/Formal Agreements: Informal agreements based on interest of collaborators

Governance Mechanism: Through the Asian Rice Farming Systems Working Group.

Organizational Structure: There are working groups at Asian level, at national level, and in some countries at the regional level.

Number of Network Staff (FTE): One full-time senior staff member and six part-time (10-20%).

Funding Sources: IRRI core budget, IDRC.

Common Network Plan/Strategy: Plan and strategies discussed during annual Asian Rice Farming Systems Working Group meeting.

Common Research Methodology: common methodologies are used in key sites for each collaboration. One objective is to develop research methodology for different production systems.

Planning Procedures: Through working group meetings and monitoring tours.

Network Publications: Proceedings of workshops, monitoring tours, reports and working group reports.

Monitoring Tours: Yes

Workshops and Conferences: Yes

Network Training: Yes

Indicators of Impact/Performance: Stimulation of national programs to conduct farming systems research, especially in the Philippines. The Philippine national program has set up 115 cropping systems research sites due to catalytic effect of ARFSN.

Remarks: A collaborative research network focusing on farming systems. This network has changed its name and acronym at least twice. It has been known variously as the Asian Cropping Systems Network and the Asian Farming Systems Network. Coordinator, Dr. Carangal, very dynamic and diplomatic; his catalytic and coordinating role has had a lot to do with achievements of ARFSN.

References:

IRRI. 1984. *Farming Systems Research at IRRI: An Overview. IRRI*, Los Banos, 21 p.

Carangal, Virgilio R. 1988. International collaboration in rice farming systems research. Paper presented at the Food Legume Coordinating Meeting, April 30-May 1, 1988, Bangkok, Thailand.

File date: 29 January 1989.

ARNAB (African Research Network on Agricultural Byproducts)

Contact Person and Address: Dr. Douglas Little, Head of Nutrition, International Livestock Center for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia. Phone: 613215. Telex: 980-21207 ILCA ET. Cable: ILCAF.

Focus: Agricultural by-products for livestock feed; groundnut by-products (Senegal), cacao by-products (Nigeria), maize stover (Cameroon). Specific objectives include:

(a) stimulate and strengthen research on crop residue and agro-industrial by-product utilization through collaborative research,
(b) collect, analyze, and disseminate literature on agricultural by-product utilization, processing methods, and databases,
(c) prepare and distribute critical reviews of literature on by-products,
(d) develop standard evaluation methodologies and terminology for accurately describing by-product feeds and on-farm study methods,
(e) conduct and analyze quantitative surveys and collect samples of important agricultural by-products,
(f) develop technologies to improve the nutritive value of agricultural by-products,
(g) providing training at technical and MSc levels, and
(h) publish newsletter and workshop proceedings.

Year Started: 1981

Lead Institution: International Livestock Center for Africa (ILCA), Addis Ababa.

Region: Africa

Countries in Network: Senegal, Nigeria, and Cameroon.

Governance Mechanism: Steering committee has eight members. Four are ex-officio members---the head of the nutrition unit at ILCA, the ARNAB coordinator, the coordinator of the Pastures Network for Eastern and Southern Africa (PANESA), and the program officer for Crop and Animal Production Systems, IDRC, Nairobi--and four regional representatives for northern, western, eastern, and southern Africa elected biennially at the annual workshops or general meetings.

Current Leadership/Coordination: ILCA

Funding Sources: Australian government, FAO, IDRC, and Ford Foundation.

Network Publications: Newsletter published in English and French four times/yr. 600 on mailing list.

Monitoring Tours: Coordinator visits participating countries twice a year.

Workshops and Conferences: Yes, themes vary. In 1986, the workshop held in Blantyre, Malawi, focused on the utilization of crop residues and agroindustrial by-products with emphasis on technologies applicable to small-scale African farmers.

Network Training: Training for 3-6 weeks for mid-level technicians. Eighteen trainees handled at ILCA headquarters in 1982.

Remarks: Network started as outgrowth of AAASA (African Association for the Advancement of Agricultural Sciences in Africa) meeting in Douala in 1981. Major function of ILCA in the network is to act as advisor and clearinghouse for funding requests. ARNAB functions as an information exchange network. As of 1988, ARNAB has no funds for collaborative research.

File date: 21 January 1989

BSP (Benchmark Soils Project)

Contact Person and Address: Department of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, University of Hawaii, 3190 Maile Way, Honolulu, Hawaii 96822.

Focus: Transferability of technology within three soil families--Typic paleudults (seven sites in Cameroon, Indonesia, Philippines), Hydric dystrandepts (eight sites in Indonesia, Philippines, Hawaii), Tropeptic eutrustox (sites in Hawaii, Brazil, and Puerto Rico). The basic question is whether agrotechnology can be transferred from one tropical region to another on the basis of soil taxonomy at soil family level. The idea here is to avoid repeating too many trials and thus to improve research efficiency. The other objectives of the network are to assist tropical countries in assessing the potential of upland areas for intensive cropping and soil management and to demonstrate the value of soil and land classification in formulating agricultural development plans in selected areas. Maize, sorghum, rice and root crops used in experiments.

Year Started: 1974

Year Ended: 1985 (see remarks)

Region: World

Countries in Network: Cameroon, U.S.--Hawaii, Indonesia, Philippines, Brazil, and Puerto Rico.

Number of Network Sites: 25

Current Leadership/Coordination: Department of Agronomy and Soil Science, University of Hawaii.

Funding Sources: USAID

Network Publications: Annual reports.

Indicators of Impact/Performance: Research findings:

(a) similarity of response to P fertilization across widely scattered sites within the same family,
(b) maize yields highest in warm dry Tropeptic eutrustox and lowest in Hydric dystrandepts,
(c) application rates of P for a given yield similar in Typic paleudults and Tropeptic eutrustox; higher P application rates needed in Hydric dystrandepts.

Remarks: In 1985, BSP evolved into the International Benchmark Soils Network for Agrotechnology Transfer (IBSNAT), which is also USAID supported.

References:
See references under IBSNAT.

File date: 30 November 1987

Cattle Milk and Meat Network

Contact Person and Address: International Livestock Center for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia.

Focus: Network is to be designed for:

(a) information exchange through conferences, workshops, newsletters, and journals,
(b) training to strengthen NARSs' capabilities in cattle milk and meat research,
(c) planning and prioritizing research programs in line with national and regional objectives and priorities,
(d) standardization of research methodologies to promote comparability of improved technologies, and
(e) implementation and monitoring of collaborative research projects.

Year Started: 1988

Lead Institution: ILCA

Member Institutions/Individuals: 53 individuals.

Region: West and Central Africa.

Countries in Network: Cameroon, Cote d'Ivoire, Ghana, Guinea, Mali, Nigeria, Senegal, and Togo.

Governance Mechanism: Steering committee; interim Working Committee has been established to prepare ground for the network.

Early Leadership: ILCA

Current Leadership/Coordination: Professor M.B. Olayiwole, Nigeria.

Organizational Structure: Coordinator, Steering Committee.

Funding Sources: To be sought.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes

Network Publications: Yes

Monitoring Tours: Yes

Workshops and Conferences: Yes; inaugural meeting was a workshop held in Nigeria, 24-27 October 1988.

Network Training: Yes

Remarks: To be set up as a collaborative research network.

References:

ILCA Newsletter 8(1):1 (January 1989)

File date: 13 June 1989

CCRN (Cooperative Cereals Research Network)

Contact Person and Address: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN. E-Mail:157:CGI505.

Focus: International nursery trials to develop improved genotypes of sorghum and pearl millet. A major aim is to enable national programs to gain access to the full range of research material in the ICRISAT system. Accelerate screening and testing of sorghum and pearl millet genotypes so that national programs are exposed to a wider range of genetic materials within the ICRISAT system. Also, provides feedback to ICRISAT scientists about problems and needs of national program breeders.

Year Started: 1987

Lead Institution: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India.

Region: Semi-arid tropics.

Early Leadership: ICRISAT

Current Leadership/Coordination: ICRISAT Center, Niamey. Coordinator position approved by TAC of the CGIAR.

Organizational Structure: Network to operate at three levels:

First Level--international trials and nurseries to screen and compare all elite sorghum and pearl millet developed in the ICRISAT system throughout the world. The tests will be done at ICRISAT research stations across a range of ecosystems in the semi-arid tropics of Africa, Asia, the Caribbean, and Latin America.

Second Level--regional cooperative trials and nurseries to compare selected material from the international trials and nurseries as well as elite lines from national programs within regions. These trials will be conducted mostly at cooperative research stations with the help of national programs. They will aim at critical evaluation of the materials for different environments, with active participation by the national programs.

Third Level--regional adaptation trials, where breeding lines and cultivated varieties selected from the cooperative trials and nurseries will be evaluated for their suitability for different environments and eventual release by the national programs.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes

Remarks: International nursery network; a material exchange type of network. See also IPMAT.

References:
Cereals network being set up. *At ICRISAT*, No. 18, p. 3, April-June 1987.

File date: 26 December 1987

CIMMYT/ESA (CIMMYT Eastern and Southern Africa Economics Program)

Contact Person and Address: Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), P.O. Box 25171, Nairobi, Kenya. Phone: 592054, 592206. Cable: CENCIMMYT, Nairobi. Telex: 22040 ILRAD.

Focus: Farming systems. Main purpose is to promote and build capacity in systems-based on-farm research techniques among national research and teaching institutions in eastern and southern Africa.

Year Started: 1976, but networking activities modest until 1981.

Lead Institution: CIMMYT

Member Institutions/Individuals: Initially directors of agricultural research, increasingly national coordinators for systems based on-farm research as these are appointed, scientists involved in on-farm research, extension workers, and faculty from agricultural universities.

Region: Eastern and southern Africa.

Countries in Network: Sudan, Zambia, Malawi, Botswana, Ethiopia, Kenya, Tanzania, Zimbabwe, Lesotho, Swaziland, Rwanda, Burundi, Somalia, Mozambique, and Uganda.

Legal Status/Formal Agreements: None

Early Leadership: CIMMYT

Current Leadership/Coordination: No formally appointed coordinator, but initiatives taken by International Maize and Wheat Improvement Center (CIMMYT--Centro Internacional de Mejoramiento de Maiz y Trigo), Nairobi office.

Network Expenditures/Budget: $250,000/yr.

Funding Sources: Funding provided by USAID, CIDA, CIMMYT. None of these donors have a line item for networking per se; support for networking is seen as part and parcel of a range of program activities.

Network Publications: Newsletter has been published quarterly since 1981. Network proceedings one to three per year. Occasional papers on methodology concerned with on-farm research.

Monitoring Tours: Sometimes in lieu of workshops, e.g. May 1986 in-field review held in Swaziland and in August 1986, an in-field review took place in Ethiopia.

Workshops and Conferences: Three main thrusts followed in workshop planning--research problems with a strong systems orientation common to several countries, methodology issues, and in-field reviews or monitoring tours. Workshops are targeted for two main groups-- (a) senior researchers and administrators, and (b) scientists. Workshops for senior researchers and administrators (e.g. extension, agricultural education) are offered every 12-18 months and focus on budgetary and management issues. In November 1985 a workshop for administrators was held in Lesotho. Workshops for scientists concentrate on technical and methodological questions.

Network Training: Workshops serve as training courses. A regional training workshop is run twice a year in collaboration with the University of Zimbabwe. First session on diagnosis and planning--3 weeks in February/March. Second session on design, implementation, management, and evaluation of experiments--2 weeks in September. Two other types of training also offered. One a week long overview, called "orientation", a second an 18-month long in-country training course where CIMMYT staff make a series of calls of 1-3 weeks over 18 months, and take 15-30 national on-farm research workers through a full research cycle: diagnosis and one round of experimentation.

Remarks: A scientific consultation network. Sudan, Zambia, Malawi, and Botswana have the strongest agroeconomic research programs. 1976-80 CIMMYT economics were preoccupied with demonstrating on-farm research techniques--especially diagnosis and experimental planning. As interest in the methods burgeoned from 1979 onwards, training began to be important and, by 1983, was dominating program activities. From 1981 networking began to develop in earnest, both as a training device and as a means of sharing experiences. However, even today only five or six of the countries in the region have appointed coordinators for on-farm research. These persons would be natural nominees as 'collaborators', but, because the process as an innovation is still fragile, we feel we need to keep in touch with directors of research, and keep them in touch with developments in on-farm research, so no formal collaborators have yet been nominated.

References:

CIMMYT. 1985. CIMMYT Regional Economics Programme. Phase II: Baseline Data Summary for USAID REDSO/ESA. CIMMYT ESA Region, Nairobi, 52 p.

File date: 25 November 1987

Common Property Resource Network

Contact Person and Address: Dr. C. Ford Runge, Department of Agricultural and Applied Economics, University of Minnesota, 231 Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108.

Focus: To facilitate exchange of information between scientists of various disciplines in different countries to help achieve better use of common property resources. Ultimate aim is to conserve and improve the use of common property resources throughout the world and to improve the lives of those people who depend on them.

Specific objectives include:

(a) disseminating news about applied, practical work in the field of common property conservation, use, and management,
(b) inform members of ongoing research activities,
(c) inform members about conferences, symposia, workshops,
(d) inform members about significant books, journal articles, and reports,
(e) report on significant events or trends related to common property resources, and
(f) develop a vital, self-sustaining, productive network of people who spontaneously share information and collaborate with each other.

Year Started: 1986

Lead Institution: University of Minnesota.

Member Institutions/Individuals: 1200

Region: World

Governance Mechanism: The project is being managed by the Center for Natural Research Policy and Management, University of Minnesota.

Early Leadership: A National Academy of Sciences Panel on Common Property Resources Management which was organized in 1984.

Current Leadership/Coordination: Dr. C. Ford Runge, University of Minnesota.

Organizational Structure: Two positions--a coordinator, and an administrative assistant. Dr. C. Ford Runge is in charge of the overall newsletter/network project while Edward D. Lotterman handles day-to-day administration and editing.

Funding Sources: Newsletter being sponsored by the National Research Council's Board on Science and Technology for International Development and the International Union for Conservation of Nature and Natural Resources (IUCN). Winrock International will also collaborate with production of the newsletter. Ford Foundation has granted funds to cover initial organization and production of a prototype issue of the newsletter.

Network Publications: Yes--The Common Property Resource Digest with four issues/yr. A Membership Directory was published in June, 1987.

Remarks: An information exchange network.

File date: 25 November 1987

CRSP (Collaborative Research Support Program)--Bean/Cowpea

Contact Person and Address: Pat Barnes-McConnell, Michigan State University, East Lansing, Michigan 48824. Phone: (517) 355-4693.

Focus: Higher yielding and more stable bean and cowpea varieties and improved management, storage, and processing practices. Specific projects include:

(a) cowpea productions systems,
(b) cowpea pest management with emphasis on biocontrol and storage insects,
(c) blight resistance and heat tolerance in beans,
(d) analysis of genetic, agroecological and sociocultural factors influencing the diversity of bean landraces,
(e) appropriate technology for cowpea preservation and processing,
(f) improvement of cowpea cultivars for arid regions, and
(g) breeding for disease and insect resistance.

Year Started: 1980

Lead Institution: Varies by project.

Lead Institution	*Project(s)*
Purdue University	Storage technologies
	Cowpea pest management
Michigan State University	Genetic, agroecological and sociocultural factors influencing the diversity of bean landraces
	Stress resistance in beans
University of Georgia	Appropriate technology for cowpea preservation and processing
University of California, Riverside	Improvement of cowpea cultivars for arid lands
Washington State University	Breeding for disease and insect resistance
	Improved biological utilization and availability of dry beans
University of Wisconsin	Nitrogen fixation
	Multiple disease resistance
Boyce Thompson Institute	Biocontrol of cowpea pests
University of Nebraska	Bacterial and rust resistance in beans
University of Puerto Rico	Disease resistance in beans
Cornell University	Agronomic and genetic aspects of bean yield and adaptation

Member Institutions/Individuals: Twenty-eight member institutions; 14 U.S. institutions, 7 African institutions, 7 Latin American institutions.

U.S. Institutions--Colorado State University; University of Georgia; Boyce Thompson Institute; University of Minnesota; University of California, Riverside; University of Wisconsin; U.S. Department of Agriculture; University of Nebraska; University of Puerto Rico; Cornell University; Purdue University; Michigan State University; University of Illinois; Kansas State University; and Washington State University.

African Institutions--Ministry of Agriculture, National Research Station, Sabele, Botswana; L'Institute de Recherche Agronomique au Cameroun, Maroua, Cameroon; Bunda College of Agriculture, Malawi; University of Nigeria, Nsukka, Nigeria; Institut Senegalais de Recherches Agricoles, Senegal; Sokoine University, Morogoro, Tanzania.

Latin American Institutions--EMBRAPA, Brazil; Instituto Nacional de Investigaciones Agricolas (INIA), Mexico; Secretaria de Estado de Agricultura, Dominican Republic; Instituto Nacional de Investigaciones Agropecuarias, Ecuador; Instituto de Ciencia y Tecnologia Agricolas, Guatemala; Escuela Agricola Panamericana, Honduras; INCAP, Guatemala.

Region: Americas, Caribbean, Africa.

Countries in Network: Botswana, Brazil, Cameroon, Dominican Republic, Ecuador, Guatemala, Honduras, Kenya, Malawi, Mexico, Nigeria, Senegal, Tanzania, and Uganda.

Legal Status/Formal Agreements: Subcontract

Governance Mechanism: Program is overseen by the U.S. Agency for International Development. USAID program manager: Harvey Hortik. This CRSP has an External Evaluation Panel.

Early Leadership: Michigan State University

Current Leadership/Coordination: Michigan State University

Number of Network Staff (FTE): CRSP person-months for FY83: 388 (LDC supported in LDCs), 53 (U.S. supported in LDC), 346 (U.S. supported in U.S.). FY84: 620, 48, 516 respectively.

Network Expenditures/Budget: Average FY83/FY84 funding US $4,541,000. FY 1989 ($2,600,000).

Funding Sources: FY83/FY84 $2,966,000 (USAID); $849,000 (host countries); $726,000 (U.S. universities and research institutes).

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Projects planned jointly. A 5-year review of the program was conducted at Michigan State University 19-24 January 1986 to review past activities and plan future directions.

Network Publications: Quarterly newsletter.

Workshops and Conferences: Yes, e.g. The Biological Nitrogen Fixation Workshop in Madison, Wisconsin; the MTSAT Workshop at Michigan State University dealing with microcomputers; the Dry Bean Quality and Women and Food Concerns Workshop at Washington State University; the Tepary Bean Workshop at Mexicali, Mexico; the Workshop on Drought and Temperature Tolerance in Beans and Cowpeas in Durango, Mexico; and the World Cowpea Research Conference cosponsored by the CRSP and IITA, Ibadan, Nigeria.

Network Training: CRSP--Bean/Cowpea has sponsored training of 90 researchers (56 from LDCs) in various degree programs and 758 people (684 from LDCs) in non-degree programs. Training was provided at U.S. universities, international agricultural research centers, and research institutions in LDCs.

Indicators of Impact/Performance:

(a) Increased awareness both in at U.S. and Third World participating institutions of basic and applied information and new germplasm resources.
(b) Seven hundred tons of a California cowpea variety, California Blackeye No. 5, was sent to Senegal in 1985 and was provided to approximately 100,000 farmers. Research had identified California Blackeye No. 5 as an appropriate variety for Senegal. Cowpea production in Senegal increased from 16,000 tons in 1984 to 80,000 tons in 1985. Over one million people benefited from the introduction of this early-maturing variety in Senegal.
(c) Heat-tolerant cowpea germplasm has been introduced to breeding operations in California as a result of CRSP activities.
(d) Some black bean lines with genetic potential to fix high levels of nitrogen have been identified and disseminated to national programs in developing countries and U.S. scientists. Now being used in breeding programs.

(e) The University of Nebraska/Dominican Republic and the University of Puerto Rico/Dominanc Republic projects have developed six new multiple disease resistant bean varieties for LDCs, U.S. programs, and international bean improvement programs, including CIAT.
(f) A new technique using monoclonal antisera for detecting and identifying seed-borne viruses has been developed by the Tanzania/Washington State University project; will be produced by private industry and will facilitate the international exchange of germplasm.

Remarks: A multipurpose commodity network somewhat similar to CIP's regional commodity networks such as PRECODEPA. Has elements of a collaborative research network, but could also be considered scientific consultation network. Projects within the program are essentially bilateral arrangements between an African institution and one or two U.S. counterparts. Considered a relatively successful network.

Positive Comments

(a) Has made major contributions to bean production in LDCs by controlling bean golden mosaic virus (Bean Program Coordinator, CIAT).
(b) Major strength of the CRSP is in training and giving needed support to LDC researchers (USAID, Kenya).
(c) has helped improve the overall well-being of the small farmer (USAID, Ecuador).
(d) Broadens perspective of U.S. scientists and may expose them to problems that have not yet turned up in U.S.
(e) Some excellent research being carried out.

Negative Comments

(a) Rapid turnover of staff in national program of Ecuador has hampered CRSP--bean/cowpea activities there.
(b) CRSP scientists do not stay long enough to conduct collaborative research with LDC personnel.
(c) U.S. researchers do not devote enough time to CRSP activities.
(d) Information needs to be distributed better and to implement technology on a commercial basis (ADO, Dominican Republic)... communications between coordinator and collaborators are a problem (USAID, Cameroon).
(e) Total research effort is poorly designed and implemented (Professor, University of Reading and Member of External Evaluation Panel).
(f) Inadequate coordination and effective communication between U.S. and LDC principal investigators (USAID, Kenya).
(g) CRSP research has been largely carried out in isolation from other LDC research (USAID, Ecuador).
(h) not enough consultation with LDCs when developing research plans.

(i) Bean project at Zamorano School in Honduras and cowpea work at Botswana appear to have some troubles (Hogan et al. 1986). Communications sometimes poor, perhaps a function of the complexity of this CRSP.

References:

BIFAD. 1986. ***Collaborative Research Support Programs***. BIFAD, U.S. Agency for International Development, January 10.

Global Plan and Progress Report: The Bean/Cowpea Collaborative Research Support Program (CRSP). Bean/Cowpea CRSP, Michigan State University, East Lansing.

Report of the External Evaluation Panel of the Bean/Cowpea CRSP for FY 87. February 25-27, 1988, 112 p.

Significant accomplishments of the Bean/Cowpea Collaborative Research Support Program (CRSP). 5 p.

Information Memorandum for the Administrator, From: S&T, N.C. Brady, Subject: Status of CRSPS, September 25, 1985.

File date: 21 January 1989

CRSP (Collaborative Research Support Program)-- Fisheries Stock Assessment

Contact Person and Address: Dr. John Rowntree, University of Maryland. Phone (301) 454-6407.

Focus: Increase marine fish production in coastal waters of LDCs through better management. Develop methods for use by LDC fisheries managers in assessing their marine fisheries stocks to assist in managing marine fisheries.

Specific objectives:

(a) produce a handbook on stock assessment for LDC fishery managers in tropical countries,
(b) test existing methodology for stock assessment as it applies to tropical fisheries,
(c) develop new methodologies for stock assessment in tropical developing countries, and
(d) develop and test multispecies fishery assessment models.

Year Started: 1985

Year Ended: Completion projected for 30 June 1990.

Member Institutions/Individuals:

U.S. Institutions--University of Maryland, University of Rhode Island, University of Washington, University of Illinois at Carbondale, Texas A&M, Iowa State University. As of 1989, University of Maryland, University of Rhode Island, and University of Washington involved.

Region: L. America, S.E. Asia.

Countries in Network: Costa Rica, Philippines, and U.S.

Current Leadership/Coordination: University of Maryland

Network Expenditures/Budget: 1985 ($500,000), 1986 ($800,000), 1987 ($895,000), 1988 ($704,000), 1989 ($704,000).

Network Training: None

Indicators of Impact/Performance: Initial multispecies model developed by the University of Rhode Island.

File date: 21 January 1989

CRSP (Collaborative Research Support Program)-- Nutrition Intake and Functions

Contact Person and Address: Dr. Doris H. Calloway, Department of Nutritional Studies, University of California, Berkeley, CA 94720. Phone: (415) 642-5201.

Focus: Functional implications of marginal deficiencies in human diets.

Year Started: 1981

Year Ended: 31 January 1988 (some possibility of this CRSP being brought back).

Lead Institution: University of California, Berkeley

Member Institutions/Individuals: Ten institutions.

U.S. Institutions--University of California, Los Angeles (in cooperation with U.C. Berkeley); University of Connecticut (with the University of Massachusetts participating); Purdue University (with the universities of Arizona and Kansas participating).

African Institutions--Department of Community Medicine, University of Nairobi, Kenya; National Institution of Nutrition, Egypt.

Latin American Institution--National Institute of Nutrition, Mexico City, Mexico.

Number of Individuals Involved: Six U.S. principal investigators, three foreign principal investigators, and many other scientists both in U.S. and abroad.

Region: Africa, Latin America, U.S.

Countries in Network: 3

Number of Network Sites: 3

Legal Status/Formal Agreements: Subcontracts with U.S. institutions. Formal agreements with overseas collaborators.

Governance Mechanism: Management Entity is the University of California, Berkeley. A Scientific Coordinating Board is composed of principal investigators.

Early Leadership: University of California, Berkeley.

Current Leadership/Coordination: Terminated

Funding Sources: USAID and collaborating U.S. institutions.

Common Network Plan/Strategy: Yes, 12-month data collection on approximately 300 households linking food intake and various functions.

Common Research Methodology: Yes for food intake, anthropometry, morbidity, cognitive development, and reproduction.

Planning Procedures: Scientific Coordinating Board regarding validity and feasibility.

Network Publications: Final reports 31 January 1988 and some journal articles.

Monitoring Tours: Two to two sites only; management and external evaluation site visits.

Workshops and Conferences: None

Network Training: Several graduate students at U.S. and foreign institutions.

File date: 21 January 1989

CRSP (Collaborative Research Support Program)--Peanut

Contact Person and Address: Dr. David Cummins, Peanut CRSP, University of Georgia, Georgia Experiment Station, Experiment, GA 30212. Phone: (404) 228-7312.

Focus: Alleviate constraints on the production and utilization of peanut for cash and subsistence. Research projects, locations, and lead institutions are as follows:

Semi-Arid Tropics in Africa: Breeding peanut for resistance to foliar and soil-borne diseases in Senegal with linkages to Burkina Faso and Niger. Texas A&M. Mycotoxin management in peanut by prevention of contamination in Senegal. Texas A&M. Peanut viruses: etiology, epidemiology, and nature of resistance in Nigeria. University of Georgia. IPM strategies for groundnut insects in Burkina Faso. University of Georgia. An interdisciplinary approach to optimum food utility of peanut in Sudan. Alabama A&M.

Southeast Asia: Peanut varietal improvement for Thailand and the Philippines. North Carolina State University. Management of arthropods on peanut in Thailand and Philippines. North Carolina State University. Rhizobia influence on nitrogen fixation and growth of peanut in Thailand and Philippines. North Carolina State University. Mycorrhizal fungi influence on growth of peanut in Thailand and Philippines. Texas A&M. Consumption of peanut as food and appropriate technology for storage/utilization in Thailand and Philippines. University of Georgia.

Caribbean: Peanut improvement for the Caribbean. University of Georgia. Peanut utilization in food systems in the Caribbean. Alabama A&M and the University of Florida.

Year Started: 1982

Member Institutions/Individuals: Twenty-two participating institutions.

U.S. Institutions--Alabama A&M; University of Georgia; Texas A&M; North Carolina State University; University of Florida.

African Institutions--Institut Senegalais de Recherches Agricoles (ISRA), and Institut de Technologie Alimentaire, Senegal; Institut Superior Polytechnique (ISP), Universit de Ouagadougou, Burkina Faso; Institut National de Recherches Agronomique du Niger (INRAN), Niger; Ahmandu Bello University, Nigeria; Agricultural Research Corporation, and the Food Research Centre, Sudan.

***S.E. Asian Institutions**--Philippine Council for Agriculture and Resources Research and Development (PCAARD), University of the Philippines at Los Banos (UPLB), Institute of Plant Breeding, the National Crop Protection Center, and the Institute of Biotechnology, Philippines; Department of Agriculture, Kasetsart University, Khon Kaen University, Thailand.*

Caribbean Institutions--Caribbean Agricultural Research and Development Institute, Trinidad; University of the West Indies, and Food Technology Institute, Jamaica; the latter institution conducts research in Trinidad, Jamaica, Belize, Antigua, St. Vincent, and St. Kitts.

Region: S.E. Asia, Caribbean, Africa, U.S.

Countries in Network: U.S., Senegal, Burkina Faso, Niger, Nigeria, Sudan, Philippines, Thailand, Trinidad, Jamaica, Belize, Antigua, St. Vincent, and St. Kitts.

Legal Status/Formal Agreements: Memoranda of Understanding.

Governance Mechanism: ***Board of Directors*** advises coordinator on management issues. Board is composed of representatives from U.S. universities and ICRISAT. ***Technical Committee*** is composed on principal investigators from each participating university, outside experts, USAID, and BIFAD (Board for International Food and Agricultural Development).

Current Leadership/Coordination: University of Georgia.

Number of Network Staff (FTE): CRSP person-months for FY 1983: 210 (LDC supported in LDCs), 11 (U.S. supported in LDCs), 209 (U.S. supported in U.S.). For FY 1984: 342, 15, 432, respectively.

Network Expenditures/Budget: 1985 budget was US $2,974,858. 1986 budget--$2,981,110. Projected budget for 1987 ($3,350,205), 1988 ($3,105,331), 1989 ($3,020,371). For 1989, actual budget is $1,700,000.

Funding Sources: USAID contributed $2,151,111 in 1985 (71% of budget total) and $2,203,337 in 1986 (74% of budget). USAID's contribution is projected to be $2,423,678 in 1987 (72% of budget), $2,313,522 in 1988 (74% of budget) and $2,202,716 in 1989 (73% if budget).

Common Network Plan/Strategy: Yes. Planning process has identified six major constraints to peanut production and utilization:

(a) low yields due to maladapted varieties and from lack of resistance to diseases insects, and drought,

(b) Aflotoxin contamination produced by the fungus *Aspergillus flavus*,
(c) yield losses caused by weeds, insects, and drought,
(d) physiological and soil microbiological barriers to higher yields,
(e) peanuts are not considered a primary food source in some areas where they could play a more prominent dietary role, and
(f) economic and sociological problems preventing more efficient production and utilization.

Workshops and Conferences: Yes

Network Training: Yes. In February 1985, the University of the Philippines at Los Banos (UPLB) and the Peanut CRSP organized a training course on Rhizobium technology to strengthen the capacity of the Philippines national program to undertake research on peanut (Valmayor, 1985). ICRISAT provides training for CRSP participants. North Carolina State University, University of Georgia, Alabama A&M, and Texas A&M provide graduate level training for Third World students involved with the network. Also, some U.S. students involved in the network receive support. Eleven U.S. students received full-time support in 1986, while another eleven were funded part-time.

Indicators of Impact/Performance: Cultivar GH 119-20, developed by B.B. Higgins at Experiment, Georgia, hardly used at all in the U.S. but was taken to Senegal as part of germplasm exchange and has become an important subsistence cultivar in many parts of W. Africa. A modified enzyme-linked technique was developed by ICRISAT scientists in collaboration with the peanut CRSP to identify peanut stripe virus in S.E. Asia. This method is being used successfully, and is particularly helpful in countries where specialist plant virology laboratories are not available (ICRISAT, 1986).

Remarks: CRSP philosophy is to match research interests of U.S. universities with counterparts in developing countries. This is a multipurpose commodity network that operates like a scientific consultation network (type 2 in SPAAR typology). Essentially a group of projects with a strong bilateral flavor rather than a true collaborative research network. Mechanisms not always in place for exchanging information between projects; the peanut CRSP, like the other CRSPs, is an umbrella 'package' rather than a single integrated program. Weak national programs have been a problem in some instances, such as in international nursery trials. Fund disbursement problems have been noted in Senegal.

References:

Peanut Collaborative Research Support Program (CRSP): Executive Summary 1985-1989. Peanut CRSP, the University of Georgia, Georgia Experiment Station, Experiment, GA 30212/U.S. Agency for International Development, Grant No. DAN-4048-G-SS-2065-00, 33 p.

ICRISAT. 1986. ***ICRISAT Research Highlights 1985***. International Crops Research Institute for the Semi-Arid Tropics, Patancheru, p. 12.

Valmayor, Ramon V. 1985. ***The Making of the Philippine Agriculture and Resources Research System: A Case for the Developing World***. Philippine Council for Agriculture and Resources Research and Development, Los Banos.

Gibbons, R.W. 1984. Discussion paper for CRSP Board of Director's Meeting. March.

File date: 21 January 1989

CRSP (Collaborative Research Support Program)--Pond Dynamics

Contact Person and Address: Dr. Howard F. Horton, Office of International Research and Development, Snell Hall 400, Oregon State University, Corvalis, OR 97331-1641. Phone: (503) 754-2228.

Focus: Provide new information relevant to increasing freshwater fish production from farm and community ponds. Projects include limited feed, low fertilizer systems, cooler water systems at higher elevations, management of cooler water ponds at medium to high elevations in Latin America, and management of brackish water and hyper-saline tropical ponds in Asia.

Basic research in the dynamic processes regulating the productivity of pond culture systems. The long-range goal is to provide quantitative management guidelines for improved pond production systems. These guidelines are intended to increase the availability of fingerlings for stocking, improve the efficiency of grow-out operations, and facilitate the integration of aquaculture with other agricultural production systems.

Year Started: 1982

Lead Institution: Varies by project.

Member Institutions/Individuals: Nine institutions.

U.S. Institutions--Oregon State University in cooperation with the University of Arkansas at Pine Bluff, Auburn University, University of Hawaii, University of Michigan, Michigan State University.

African Institutions--National University of Rwanda, Rwanda.

Latin American Institutions--*Ministry of National Resources, Resources Directorate of Renewable Natural Resources (RENARE), Honduras.*

S.E. Asian Institutions--Department of Fisheries, Ministry of Agriculture and Cooperatives, Thailand.

Number of Individuals Involved: 36

Region: World

Countries in Network: Originally Honduras, Indonesia, Jamaica, Panama, Philippines, Rwanda, Sierra Leone, and Thailand. As of 1988 down to Honduras, Indonesia, Panama, Philippines, Rwanda, and Thailand, and for 1989, only Honduras, Rwanda, and Thailand.

Number of Network Sites: 3

Legal Status/Formal Agreements: Yes, with Honduras, Rwanda, and Thailand.

Current Leadership/Coordination: Oregon State University

Number of Network Staff (FTE): FY 1984: 230 person-months; 88 (LDC supported), 121 (U.S. supported in LDCs), and 21 (U.S. supported in U.S.). 1988: 54 staff (FTE).

Network Expenditures/Budget: FY 1982 ($650,000), FY 1983 ($750,000), FY 1984 ($1,000,000), FY 1985 ($1,040,000), FY 1988 ($950,000); FY 1989 ($920,000).

Funding Sources: FY 1983/FY 1984 $729,000 (USAID), $146,000 (U.S. universities), $576,000 (host countries). FY 1988 $920,000 (USAID), $98,750 (U.S. universities), $45,000 (host countries).

Common Network Plan/Strategy: Yes; principal investigators convene annual workshops to develop work plan and to standardize the research methodology applicable for each site to reduce variable and facilitate comparison of research results.

Common Research Methodology: Yes; see common network plan/strategy section above.

Planning Procedures: Yes

Network Publications: A comprehensive, detailed publication reviewing available scientific information was published in 1983 entitled ***Principles and Practices of Pond Aquaculture: A State of the Art Review***. This has been widely distributed and serves as a guide. It also serves as a founding document, a basis upon which to launch the network (similar to the survey of trypanotolerance as precursor to the Trypanotolerance Network). Four report series are published; ***Collaborative Research Data Reports (3 vols.); Research Reports (9 nos.), Aquanews (2-3 issues/yr), and Annual Administrative Reports (5 issues).***

Monitoring Tours: USAID Triennial Review.

Workshops and Conferences: Yes

Network Training: None

Indicators of Impact/Performance: Rwanda has attracted an EEC grant to renovate and improve a fish farming research station for cooperative CRSP work. USAID/Thailand provided supplemental funding to facilitate CRSP work (buy-in). This CRSP has developed a database which can be tapped for information on pond management.

Remarks: This CRSP has shrunk in size with several LDCs no longer participating (see countries in Network). Reasons for this unclear, but could be related to recent budget cuts that CRSPs have had to absorb.

Positive Comments

(a) A unified global program rather than a loosely related collection of country projects.
(b) CRSP concepts and approach are fundamental to understanding principles and research needs.
(c) CRSP developing a unique database that will be valuable in strengthening and developing fish farming technology.

Negative Comments

(a) CRSP research not applicable to immediate problems of Thailand.
(b) Research perceived as an exercise in limnological testing primarily of academic interest in Thailand.
(c) Rwandans feel that communications between principal investigators has been inadequate.
(d) USAID Panama points out that CRSP research unacceptable since no prior economic analysis performed.
(e) CRSP research in Indonesia has been criticized as not being designed to assist with near-term increases in aquaculture productivity.
(f) USAID Jakarta has suggested that experimental design is faulty.
(g) Better communication among researchers and administrators is needed.
(h) Some procedures for physical and chemical analyses need further standardization.
(i) Computer analysis and modeling work is lagging.

References:

Information Memorandum for the Administrator, from S&T, N.C. Brady, Subject: Status of CRSPS, September 25, 1985.

File date: 24 January 1989

CRSP (Collaborative Research Support Program)--Small Ruminant

Contact Person and Address: Dr. William Weir, University of California, Davis, CA 95616. Phone: (916) 752-1721.

Focus: Improving productivity of livestock for smallholders through better disease control and nutrition. Projects include animal health, economics, production systems and forages, rural sociology, systems analysis, animal breeding, nutrition and by-products, range management, reproductive physiology, and animal management.

Year Started: 1978

Member Institutions/Individuals:

U.S. Institutions--Washington State University; Winrock International; University of Missouri; Texas A&M University; North Carolina State University; University of California at Davis; Utah State University in conjunction with California State Polytechnic University); Texas Tech University; Colorado State University; Montana State University.

African Institutions--Ministry of Livestock Development (Kabete, Maseno Vet, Ol Magogo Farm, and Naivasha Research Stations), Central Bureau of Statistics, FAO/SGDP Kabete, Kenya; Institute Agronomique et Veterinaire, Tadla Field Station, Er Rachidia Station, National School of Agriculture, Meknes, Morocco.

Latin American Institutions--EMPRABA/CNPC (Sobral); EMEPA (Fazenda Pendencia at Paraiba, Bahia); Universidade Federal do Cear , Fortaleza; CPATSA (Petrolina); EPACE (Fazenda Iracema, Quixada), Brazil; UNA (Lima); IVITA (La Rey), Peru; Pedro Ruiz Gallo University (Lambayeque), Peru; University of Piura (Piura), Peru; INIPA (Lima); UNTA, Direccion des Comunidades Campesinas, University of San Agustin (Arequipa), Peru; University of Huancayo, Peru; University of San Marcos (Lima), Peru.

S.E. Asian Institutions--Balai Penelitian Ternak, Gajah Mada University. (Jogjakarta), Margawati Animal Breeding Station (W. Java), Bogor Agricultural Institute, Balai Penelitian Penyakit Hewan (Bogor), Satya Wacana University (Central Java).

Region: World

Countries in Network: Brazil, Indonesia, Kenya, Morocco, Peru, and U.S.

Governance Mechanism: Strong technical committee essentially runs the network. Management office in this CRSP has been subservient (in contrast to the Soil Management CRSP). This relationship may

have reduced the decisiveness with which the management office has been able to deal with problems.

Current Leadership/Coordination: University of California at Davis.

Organizational Structure: ***Management Entity***--the coordinator, served by three committees:

Technical Committee--an executive committee charged with developing and implementing research projects in the U.S. and overseas. Membership composed of all principal investigators.

Board of Institutional and Host Country Representatives (BIR)--an executive committee concerned primarily with budget and policy. Consists of representatives from the administrations of participating institutions.

External Evaluation Panel (EEP)--an advisory committee responsible for reviewing and evaluating CRSP research activities. Consists of a multi-disciplinary group of eminent scientists from institutions not participating in the CRSP.

Number of Network Staff (FTE): Person-months as follows: FY 1983 563 person-months (LDC supported in LDCs), 187 (U.S. supported in LDCs), U.S. supported in U.S.). FY 1984 the respective figures are 614, 204, 544.

Network Expenditures/Budget: FY 1983/FY 1984 $5,578,000. FY 1989 ($2,800,000).

Funding Sources: FY 1983/FY 1984 US $2,850,000 (USAID), $1,285,000 (U.S. universities), $1,318,000 (host countries), $125,000 (other).

Network Publications: Yes--***Small Ruminant Research Highlights*** (published out of the University of California, Davis). First issue was Fall 1985.

Network Training: As of 1985, 60 MS and 24 PhD students from LDCs and 16 MS and 12 PhD students from the U.S.

Indicators of Impact/Performance: A new vaccine against one major disease of goats (contagious caprine pleuropneumonia-CCPP) has been developed and is proving highly successful in protecting goat herds from W. Africa to Asia, where 48 million goats are potentially at risk for the disease.

Remarks: This CRSP apparently had some initial growing pains, but has apparently matured into an effective network.

Positive Comments
Most comments underline the institution building that has resulted from CRSP activities, particularly in Indonesia and Peru.

(a) Training program is commendable (USAID, Jakarta).
(b) Small ruminant CRSP has contributed significantly to institution building in Indonesia (USAID, Jakarta).

Negative Comments
(a) CRSP management overloaded with bureaucratic requirements, such as reports, often requested at very short notice. Also, too many reviews.
(b) Rotation of U.S. AID mission staff has caused some disruption.
(c) Original targets of this CRSP have not been met.
(d) Little if any collaboration with ILCA, although opportunities to do so exist, particularly in the sheep and goat work that ILCA is conducting based at IITA.

References:
Hogan, Edward B., Kenneth O. Rachie, and John S. Robins. 1986. Collaborative Research Support: Program Review Study.

Information Memorandum for the Administrator, From: S&T, N.C. Brady, Subject: Status of CRSPS, September 25, 1985.

Small Ruminant Collaborative Research Support Program: Research Publication and Training Roster 1978-1985. Small Ruminant Collaborative Research Support Program (SR-CRSP), University of California, Davis, 122 p.

Small Ruminant Collaborative Research Support Program: Annual Report 1984-1985. Small Ruminant Collaborative Research Support Program (SR-CRSP), University of California, Davis, 153 p.

Proceedings of the CRSP Directors and Program Managers Workshop, Decade Two Preparation: Final Report.

Small Ruminant Collaborative Research Support Program Annual Report for Kenya: Program Year Eight, 1986-87. Small Ruminant CRSP, University of California, Davis.

Small Ruminant Collaborative Research Support Program Annual Report for Peru: Program Year Eight, 1986-87. Small Ruminant CRSP, University of California, Davis.

Small Ruminant Collaborative Research Support Program Annual Report for Indonesia: Program Year Eight, 1986-1987. Small Ruminant CRSP, University of California, Davis.

Small Ruminant Collaborative Research Support Program Annual Report for Brazil: Program Year Eight, 1986-87. Small Ruminant CRSP, University of California, Davis.

Small Ruminant Collaborative Research Support Program Summary Report: Program Year Eight, 1986-87. Small Ruminant CRSP, University of California, Davis.

File date: 21 January 1989

CRSP (Collaborative Research Support Program)--Soil Management (also known as Tropsoils)

Contact Person and Address: Dr. Charles B. McCants, North Carolina State University, Raleigh, NC 27695. Phone: (919) 737-3922.

Focus: Basic problems concerned with soil management to alleviate crop production constraints. Projects include management of soils in the semi-arid tropics, humid tropics, and acid savannas. Topics include soil crusting, low input systems, maximizing use of available soil water, plant and rhizobia tolerance to drought, improve efficiency in use of lime and fertilizer via plant and soil management, alternatives to shifting cultivation, alternative cropping systems, improved land clearing practices and efficient fertilization schemes for low fertility soils, soil conservation.

Year Started: 1981

Year Ended: Currently projected to 1992.

Lead Institution: North Carolina State University

Member Institutions/Individuals:

U.S. Institutions--Texas A&M University, Cornell University, North Carolina State University, University of Hawaii.

Asian Institutions--International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India; AARD, Indonesia.

Latin American Institutions--EMBRAPA, Brazil; National Agrarian University, La Molina, Lima, Peru; INIPA, Peru.

African Institution--National Institute of Agronomic Research for Niger (INRAN), Niger.

Number of Individuals Involved: Thirty project leaders.

Region: Tropics--world.

Countries in Network: Brazil, Cameroon, Indonesia, Mali, Niger, and Peru.

Number of Network Sites:
Brazil: Planaltina, Cerrado region; Manaus, Amazonas.
Indonesia: Six transmigration sites near Sitiung, W. Sumatra.
Niger: ICRISAT Center, Niamey.
Peru: Yurimaguas

Legal Status/Formal Agreements: 5

Governance Mechanism: Management office plays a very significant role in decision-making. The technical committee plays a lesser role. Board of Directors exerts pressure on management office to take the lead in proposing program changes and in their implementation. Recently, short-term consultants have been brought in for technical advice and for particular reviews.

Organizational Structure: Management Entity, Board of Directors, Technical Committee, External Evaluation Panel.

Number of Network Staff (FTE): CRSP person-months for FY 1983: 45 (LDC supported in LDCs), 187 (U.S. supported in LDCs), 30 (U.S. supported in U.S.). FY 1984 the respective figures are 63, 293, 49.

Network Expenditures/Budget: FY 1983/FY 1984 US $2,712,000. FY 1989 ($2,100,000).

Funding Sources: FY 1983/FY 1984 $1,866,000 (USAID), $438,000 (U.S. universities), $153,000 (host countries), $255,000 (other).

Network Publications: Tropsoils Communiques.

Workshops and Conferences: Thirty as of June 1988.

Network Training: Eleven MS and 30 PhD students from LDCs, 13 MS and 19 PhD students from the U.S. as of June 1988.

Remarks:

Positive Comments

(a) CRSP soil management activities relevant to research priorities of Peru, Indonesia, Brazil and Niger.
(b) This CRSP has brought together a critical mass of high quality scientists to work on some significant soil problems in the tropics.

Negative Comments

(a) Too many visits for too short a time; fewer, lengthier visits would be more productive (Mali, USAID, Niamey).
(b) More CRSP funds should go to host country (INIPA, Peru).
(c) Excessive paperwork, bureaucracy.

References:

Information Memorandum for the Administrator, From: S&T, N.C. Brady, Subject: Status of CRSPs, September 25, 1985.

Caudle, N. (no date). ***Tropsoils: The First Three Years***. Department of Agricultural Communications, North Carolina State University, 56 p.

Hogan, Edward B., Kenneth O. Rachie, and John S. Robins. 1986. Collaborative Research Support: Program Review Study.

File date: 5 February 1989

CRSP (Collaborative Research Support Program)--Sorghum/Millet (also known as INTSORMIL)

Contact Person and Address: Dr. Glen Vollmar, University of Nebraska, Lincoln, Nebraska 68583. Phone: (402) 472-6032.

Focus: Boosting yields and production of sorghum and millet. Projects include breeding, irrigation, agronomy technology, low water, low energy requirements, socioeconomic studies, nutrition studies, and sorghum cultivation in acid soils.

Year Started: 1979

Member Institutions/Individuals:

U.S. Institutions--University of Arizona, University of Kentucky, Purdue University, Mississippi State University, Texas A&M, Kansas State University, University of Nebraska.

African Institutions--Ministry of Agriculture, American University of Cairo; Agricultural Research Corporation, University of Khartoum, Food Research Institute, Sudan; Institute of Rural Economy, Agronomic Institute, Mali; Ministry of Agriculture, National Research Station, Botswana; SAFGRAD; Ministry of Agriculture, Niger.

Latin American Institutions--CIAT, Cali, Colombia; EMBRAPA, Brazil; Ministry of Agriculture, Institute of Anthropology, Pan American School of Agriculture, Honduras; INIA-SARH, Mexico.

S.E. Asian Institutions--IRRI, Philippine Council of Agriculture and Resources Research, University of the Philippines, Philippines.

Region: Africa, Latin America, Caribbean.

Countries in Network: 11

Governance Mechanism: ***Board of Directors*** consists of six institutional representatives from each of the participating U.S. institutions. Board members are designated by the chief executive officers of their institutions to represent them on policy and administrative matters. The Board elects a chairperson and vice chairperson on an annual basis.

The ***Management Entity*** serves as the executive secretariat of the Board. The Board is the top management and policy board for the CRSP. Management Entity is the University of Nebraska and is the primary grantee of USAID. The University of Nebraska then issues subcontracts to participating U.S. universities.

The ***Technical Committee (TC)*** acts on most technical and operational matters and forwards its recommendations to the Board of Directors. This committee consists of six members, representing each of the six disciplinary areas in the program. Principal investigators are nominated for membership on the TC by members of the discipline.

The ***Ecogeographic Zone Council's*** primary responsibilities are planning and implementation of identified host country and U.S. collaborative sorghum/millet activities related to research, training, and networking. Membership consists of one principal investigator for each of the ecogeographic zones.

The ***External Evaluation Panel (EEP)*** has five members, nominated by PIs, the TC, and institutional reps. The Board of Directors recommends the EEP members to USAID/Washington and BIFAD, which give final approval.

Current Leadership/Coordination: University of Nebraska

Number of Network Staff (FTE): CRSP person-months for FY83: 440 (LDC supported in LDCs), 98 (U.S. supported in LDCs), and 167 (U.S. supported in U.S.). FY 1984: 446, 78, 176 respectively.

Network Expenditures/Budget: FY 1983/FY1984 US $4,088,000. FY 89 ($ 2,700.000).

Funding Sources: FY1983/FY1984 US $2,683,000 (USAID), $910,000 (U.S. universities), $395,000 (host countries), $100,000 (other).

Network Publications: Annual Reports.

Network Training: As of 1985, 83 MS and 100 PhD students from LDCs, and 77 MS and 74 PhD students from the U.S.

Indicators of Impact/Performance: Farmers in Sudan are obtaining yield increases of more than 150% compared to best local varieties as a result of planting a new sorghum hybrid, Hageen Dura-1, developed and tested by CRSP scientists building on research efforts at a number of institutions. Other indicators of success can be found in Annual Report 1987.

Remarks: This CRSP did not really start from scratch; rather, some existing projects were brought together.

Positive Comments
Generally stress the value placed on exchange of ideas between national scientists and their U.S. counterparts and commend quality of the collaborative work.

Negative Comments

(a) Budget too limited for a global program.
(b) Frequent rotation of USAID personnel disruptive.
(c) Communication sometimes a problem because of numbers of institutions involved and cultural and language differences.

References:

Information Memorandum for the Administrator, From: S&T, N.C. Brady, Subject: Status of CRSPS, September 25, 1985.

INTSORMIL Annual Report 1987: Sorghum/Millet Collaborative Research Support Program (CRSP).

File date: 21 January 1989

EARSAM (Eastern Africa Regional Sorghum and Millets Network)

Contact Person and Address: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN. E-Mail:157:CGI505.

Focus: Develop sorghum and millet (finger and pearl) cultivars with high and stable yields with genetic resistance to biotic and abiotic stresses. Another major overall objective is to assist and strengthen national sorghum and millet programs in the semi-arid zones.

Year Started: 1982

Countries in Network: Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Somalia, Sudan, and Uganda.

Governance Mechanism: All SAFGRAD networks are guided by an oversight committee composed of NARS scientists, administrators, and university staff from LDCs. This oversight committee:

(a) provides guidance in SAFGRAD's management and policy issues,
(b) reviews work plans and provides guidance on how SAFGRAD can give effective technical services to NARS of OAU/SAFGRAD member countries,
(c) emphasizes the importance of food grain crops and other related networks, and
(d) reviews annual technical progress of network activities.

EARSAM has a regional coordinator and a steering committee. The ***Steering Committee*** is composed of one representative from each national program and has six elected members. Members have diverse disciplinary backgrounds and serve for two consecutive years. New members are elected at the regional workshop held every other year. The steering committee provides overall guidance to the regional coordinator concerning networking activities. Other representatives from such institutions as ICIPE, USAID, and IDRC may join as observers and contribute ideas for research projects. Specific functions of the steering committee include:

(a) prepare long- and short-term network action plans based on regional priorities,
(b) monitor implementation of workshop recommendations,
(c) facilitate implementation of the research network program components in their respective countries and in the region,
(d) determine themes for regional and short course workshops, and
(e) provide overall guidance for networking activities.

The ***Regional Coordinator*** develops priority research projects together with NARSs and makes sure each project is properly executed.

Early Leadership: ICRISAT

Funding Sources: USAID provides money to SAFGRAD which then provides money to ICRISAT for the network.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes

Workshops and Conferences: From 1982 to 1986, five regional workshops offered. Regional workshop now apparently held every other year.

Network Training: Yes--in-service and in-country training. Each year, one to three scientists from NARS are identified to receive in-service training at ICRISAT, India, for 6 months. For in-country training, specific short courses are offered to NARS scientists on sorghum and millet improvement.

Remarks: EARSAM is a project of the Semi-Arid Food Grain Research and Development Project (SAFGRAD). It receives a great deal of assistance from ICRISAT through germplasm exchange, training, visits of ICRISAT staff, and some more basic research outside of the capacity of NARSs in the region. Set up as a collaborative research network.

References:

Guiragossian, Vartan. 1988. A regional network to improve sorghum and millets in eastern Africa. In: ***Eastern and Southern Africa Network Coordinators' Review, Held at Nairobi, Kenya, 9-12 May 1988,*** D.G. Faris and A.D.R. Ker (Editors), pp. 31-40, IDRC/CRDI/CIID, Manuscript Report 204e, Ottawa, Canada.

File date: 23 January 1989

ESARRN (East and Southern Africa Root Crop Network)

Contact: International Institute for Tropical Agriculture (IITA), PMB 5320, Ibadan, Nigeria. Phone: 400300.

Focus: Specific objectives are to:

(a) encourage rigorous collaborative planning and evaluation of root crops research in the region,
(b) increase the genetic base of the principal root crops and enhance their use in regional improvement programs,
(c) facilitate improvement of root crops-based cropping systems through surveys and methodology development,
(d) develop improved techniques for drying, processing, and using cassava, and
(e) foster the establishment of effective systems to exchange information and to deliver improved technology to farmers.

Year Started: 1985

Countries in Network: Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda, Malawi, and Zambia.

Governance Mechanism: Progress on the project activities is jointly monitored at regular intervals by donor representatives, the IITA/TRIP and ICP representatives, and the steering committee. The monitoring team reviews work plans and progress on the network research activities.
Donors and IITA are continuously reviewing the activities to check if inputs, work schedules, and target outputs are proceeding according to plan.

Early Leadership: IITA, Ibadan, Nigeria.

Current Leadership/Coordination: IITA

Organizational Structure:
Coordinator appointed by IITA. Coordinator is responsible for:

(a) coordinating among various international, regional, and national root crops research programs,
(b) assisting participating countries to identify and discuss their needs and accomplishments,
(c) providing technical assistance directly or by appointing regional scientists as consultants to advise NARSs,
(d) organizing meetings, workshops, training, monitoring trips, and evaluation, and
(e) day-to-day management of operating and research funds by means of an imprest account.

Steering Committee approves budget.

Funding Sources: IDRC and USAID. IITA makes in-kind contributions, mostly by arranging for the services of consultants to fill specific knowledge/expertise gaps in NARSs. National programs also make contributions toward specific research topics undertaken by the network.

Common Network Plan/Strategy: Yes; tasks are divided up among participating NARSs according to their comparative advantages and strengths:

Country	*Project*
Burundi	Multiplication of healthy planting material
Ethiopia	Selecting early bulking sweet potatoes for drought resistance
Kenya	Transecology studies
Rwanda	Improved root crops populations
Tanzania/ Zanzibar	Improvement of cassava-based intercropping systems, technology transfer
Uganda/Malawi	Post-harvest technology of cassava
Zambia	Screening cassava for resistance to cassava mealybug

Common Research Methodology: Yes

Planning Procedures: Root crops researchers in the region contribute to planning related to specific research problems and become involved in setting research priorities.
The heads of participating national programs are involved in planning collaborative projects.

Network Publications: Newsletter

Monitoring Tours: Yes

Network Training: Yes, short- and medium-term training to improve scientists' skills in various areas of root crop research.

Indicators of Impact/Performance: New root crop varieties introduced by tissue culture from IITA have been released to farmers or used as source material to develop new varieties. The network has enhanced the professional capacity of researchers to evaluate and select lines of special interest to their programs. Also, the network has helped some NARSs gain the capacity to disseminate root crops technology to farmers. The network provides a "legitimatizing" effect for national programs, thereby helping them attract external funds and internal support from policymakers.

Remarks: Set up as a collaborative research network. While this network appears to be making good progress, the uneven scientific capacity of network members is a drawback. Further strengthening of NARS in the region is clearly needed. Root crops research in particular does not attract enough people to fill the positions.

File date: 23 January 1989

FADINAP (Fertilizer Advisory Development and Information Network for Asia and the Pacific)

Contact Person and Address: Alain G. Vaes, Team Leader, FADINAP/ARSAP, Agriculture Division, Economic and Social Commission for Asia and the Pacific, the United Nations Building, Rajadamnern Avenue, Bangkok 10200, Thailand. Phone: 2829161-200, 2829381-389. Telex: 82392 ESCAP TH, 82315 ESCAP TH.

Focus: Issues related to the supply, marketing, distribution, and use of fertilizer. Specific objectives:

(a) to facilitate, spread, and increase the balanced use of fertilizer use in LDCs of Asia and the Pacific in order to raise agricultural productivity, especially food production by small-scale farmers, and to spread the benefits of agricultural development among broader sections of the farming population,
(b) to promote efficiency in the supply, marketing, distribution and use of fertilizer in order to reduce costs and also to enhance environmental awareness, and
(c) to save foreign exchange of the member countries through the judicious use of fertilizer.

Year Started: 1978

Region: Asia and the Pacific

Countries in Network: Twenty-four as of November 1987 (Afghanistan, Bangladesh, China, Commonwealth of the Northern Mariana Islands, Cook Islands, Federated States of Micronesia, Fiji, Guam, India, Indonesia, Iran, Laos, Malaysia, Nepal, Pakistan, Philippines, Republic of Korea, Marshall Islands, Palau, Samoa, Sri Lanka, Thailand, Tonga, and Viet Nam).

Funding Sources: U.N. Economic and Social Commission for Asia and the Pacific (ESCAP), FAO, and the United Nations Industrial Development Organization (UNIDO).

Network Publications: *Agro-chemicals News in Brief* (quarterly, with two special issues published annually); *Fertilizer Trade Information Telex; Fertilizer Price and Trade Information; The Regional Information Support Service (RISS); Calendar of Meetings on Agro-chemicals* (quarterly); also, country reports and other publications on the marketing, distribution, and use of fertilizers are produced occasionally.

Workshops and Conferences: Yes, e.g. Symposium on Fertilizer Sulphur Requirements and Sources in Developing Countries of Asia and the Pacific, Bangkok, 27-31 January, 1987.

Network Training: Yes

Remarks: An information exchange network, but also provides some advisory services and training opportunities. More than just a simple mailing list operation. FADINAP evolved out of the Agricultural Requisites Scheme for Asia and the Pacific (ARSAP), presently concentrating largely on agro-pesticides.

File date: 29 January 1989

F/FRED Research Network (Forestry/Fuelwood Research and Development)

Contact: Forestry Research Institute of Malaysia.

Focus: Increasing productivity and availability of improved fast-growing tree species for fuelwood and other household and commercial purposes by rural farmers.

Year Started: Proposed in 1986 during the first F/FRED Forestry Networks workshop 24-27 September, Bangkok, by a planning group of Asian forestry research scientists.

Governance Mechanism: ***Steering Committee*** serves as the governing body. Composed of one representative from the lead institution of each participating country. ***Research Committee*** focuses on the biophysical and socioeconomic dimensions for achieving the network objectives.

Current Leadership/Coordination: Dr. Salleh M. Nor, Director General, Forest Research Institute of Malaysia (FRIM).

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Remarks: Designed to build on the work of the International Union of Forestry Research Organizations (IUFRO).

References:

Research network established. ***Farm Forestry News: Forestry/Fuelwood Research and Development Project***, No. 2, Fall 1986, p. 1.

File date: 26 December 1987

Great Lakes Regional Bean Program

Contact Person and Address: Centro Internacional de Agricultura Tropical (CIAT) Regional Office, c/o ILCA, Addis Ababa, Ethiopia.

Focus: Raise bean productivity in the densely settled region encompassing Rwanda, Burundi, and the Kivu province of Zaire. Two lines of research are being pursued in this regional research effort:

(a) varietal improvement with emphasis on higher yield combined with resistance to disease and tolerance to poor soils or drought, and
(b) increased bean yields through pest protection or better agronomic practices, such as substituting climbing beans for bush beans, associating beans with leguminous shrubs to improve soil fertility, or improving the quality of seed.

Year Started: 1983

Member Institutions/Individuals:
Institut des Sciences Agronomiques de Burundi (ISABU)
Institut des Sciences Agronomiques de Rwanda (ISAR)
Programme National Legumineuses, Zaire (PNL)
Universit Nationale de Rwanda (UNR)
CIAT

Region: Central Africa (Great Lakes Region).

Countries in Network: Burundi, Rwanda, and Zaire.

Early Leadership: CIAT

Organizational Structure: Common Network Plan/Strategy (See below).

Funding Sources: Swiss Development Cooperation

Common Network Plan/Strategy: Yes.
First step was to inventory bean diseases and pests. ISAR screens materials for resistance to anthracnose. ISABU screens for halo blight, floury leaf spot, common bacterial blight, and bean fly. Zaire posts a full-time pathologist for legumes in southern Kivu to conduct research on rust and angular leaf spot. A regional nursery, PRER (Pepinire Regionale d'Evaluation de Resistance), was established to evaluate the best varieties from the region's international disease nurseries, looking for stability across ecological zones and seasons. National programs exchange promising sources of resistance through the PRER. A second regional nursery, PRELAAC (Pepinire Regional d'Evaluation de Lignes Avances de l'Afrique Centrale) was set up to evaluate

advanced breeding lines. PRELAAC exposes each national program's 60-70 most advanced lines to a barrage of pressures, principally diseases. For cultural practices the tasks are divided as follows:

Bean fly--seed treatments (ISABU, CIAT, ISAR, Universite Nationale du Rwanda)
Root rots--seed treatments (CIAT, ISAR)
Farmer auto-seed package--resistance in mixtures (PNL).

Common Research Methodology: Yes

Planning Procedures: Yes

Indicators of Impact/Performance: The network is developing adapted varieties that resist major diseases, including angular leaf spot, anthracnose, and halo blight. It is also testing seed treatment methods, and extending the use of higher-yielding climbing beans in areas where these have not traditionally bean grown.

Remarks: A collaborative research network with heavy emphasis on germplasm testing and agronomy. The Research Institute for Plant Protection (IPO) in the Netherlands and the National Vegetable Research Station in Wellsbourne, England, have assisted in research on halo blight, BCMV, and species of Ascochyta and Phoma.

References:
Improving bean yields in Africa's Great Lakes Region. *CIAT International* 6(2):3-6 (December 1987)

File date: 5 February 1989

IBSNAT (International Benchmark Sites Network for Agrotechnology Transfer)

Contact Person and Address: Dr. G. Uehara, Principal Investigator, IBSNAT, Department of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, University of Hawaii, 3190 Maile Way, Honolulu, Hawaii 96822.

Focus: Agricultural systems research. Goals are to:

(a) accelerate flow of technology from its site of origin to new locations,
(b) maximize the successes and minimize the failures in transfer of agricultural technology in the tropics and subtropics, and
(c) assess the long-term effects of agricultural practices on the soil resource.

Year Started: 1982

Year Ended: Projected to end in 1992.

Lead Institution: University of Hawaii

Member Institutions/Individuals: Thirty-four institutions/ organizations are involved as follows:

International/Regional Centers
ICRISAT, CIAT, ICARDA, IFDC, ABSNAT, OBSNAT, CATIE, ACSAD, AVRDC, FFTC/ASPAC.

National Institutions
Australia (CSIRO); University of Burundi; University of Guelph, Canada; Fiji (MPI); Indonesia (AARD); Jordan; Malaysia; New Zealand; Pakistan; Panama; Philippines; Taiwan, China; Thailand; Venezuela; Zambia.

Multilateral
FAO; U.S.; USDA (ARS, ERS, SCS); Cornell; University of Florida; Guam; Michigan State University; University of Hawaii; University of Puerto Rico.

Number of Individuals Involved: 140

Region: World

Entities in Network: Australia; Burundi; Cameroon; Canada; Colombia; Costa Rica; Fiji; Federal Republic of Germany; Guam; India; Indonesia; Jordan; Malaysia; Morocco; Pakistan; Panama; Philippines; Puerto Rico; Syria; Taiwan, China; Thailand; Tunisia; U.K.; U.S.; Venezuela; and Zambia.

Number of Network Sites: 30

Legal Status/Formal Agreements: Memorandum of Agreement.

Governance Mechanism: ***Management Review Group (MRG)*** is composed of the USAID Project Monitor, Dr. T.S. Gill; Dr. M.R. Smith, Assistant Director, Agricultural and Applied Behavioral Sciences Research; and the UH Principal Investigator, Dr. Goro Uehara, as equal members. This is the principal and formal means by which the USAID Project Monitor and the Principal Investigator exercise joint responsibilities. The MRG meets on the call of either party, usually when other business requires their joint presence, but at least once a year.

Current Leadership/Coordination: University of Hawaii

Number of Network Staff (FTE): The Coordinator devotes about 40% of his time to IBSNAT.

Network Expenditures/Budget: First 5 year (phase I) budget commencing in 1982 was $4,300,000. Second 5 year (phase II) budget, commencing August 31, 1987, was $5,630,000. Actual phase II budget will be higher due to mission and regional bureau "buy-ins" in the amount of $1,490,000 and $1,425,000 from the University of Hawaii. Other government and private sector contributions are anticipated in the amount of $1,880,000. Thus total budget for 1987-1992 is $10,425,000.

Funding Sources: USAID

Common Research Methodology: Yes--experimental and data collection procedures are standardized.

Network Publications: ***Agrotechnology Transfer*** (first issue published September 1985) serves as the network's newsletter. IBSNAT also publishes ***Technical Reports***, such as Report 1: ***Experimental Design and Data Collection Procedures for IBSNAT***.

Workshops and Conferences: Yes, e.g. 1983 international IBSNAT symposium held in India, attended by 59 collaborators. 1984 IBSNAT meeting held in Maui, Hawaii.

Network Training: Training workshops, rather than formal courses. IBSNAT's second training workshop on Systems Analysis and Crop Simulation for Agrotechnology Transfer held in Amman, Jordan, 4-13 November 1985. Workshop format includes lectures and practical exercises. A short course on "Management of IBSNAT Experiments and Collection of Minimum Data Set for Crop Modeling" was held in Honolulu, Hawaii, January 20 to February 13, 1987. A training workshop on "Systems Analysis and Crop Modeling" with

emphasis on peanut was held in Hyderabad, India, in April 1987 and has hosted by ICRISAT.

Indicators of Impact/Performance:

(a) IBSNAT is developing a software program entitled ***Decision Support System for Agrotechnology Transfer (DSSAT)*** which can run on inexpensive microcomputers designed to simulate crop performance over a 10-50 year period for locations with soils and climate data. DSSAT has been developed for maize, wheat, groundnut, and soybean and is being developed for rice, sorghum, common bean (Phaseolus vulgaris), potato, cassava, and aroids. When fully operational, the program will be able to assess the effects of cultivar, site, weather, and management practices for a specific crop at a particular location. This information would be available to government planners, extension agents, and farmers within days, rather than years.

(b) IBSNAT is helping nurture regional networks such as the ASEAN Benchmark Sites Network for Agrotechnology Transfer (ABSNAT) and Oceania Benchmark Sites Network for Agrotechnology Transfer (OBSNAT). Preparations for setting up ABSNAT were underway in 1985 and the network will involve six countries. OBSNAT will encompass 19 oceanic countries. At the request of USAID, consideration is being given to setting up the Caribbean Benchmark Sites Network for Agrotechnology Transfer (CARIBSNAT).

Remarks: Some concern that IBSRAM and IBSNAT overlap; IBSNAT has been perceived as more of a soil taxonomy effort (due largely to its predecessor, BSP), but that is not really so. IBSRAM has broader scope, more projects, and is heavily involved in assembling databases and devising crop simulation models. Crop simulation models are a laudable exercise and undoubtedly will prove helpful, but some caution is called for. Real farming conditions are extremely complex with many variables, not all of which can be reliably assessed a numerical value or predicted. Some on-site testing will still be needed. Models can only be as good as the data fed in, and for some cropping situations in the tropics, very few quality data are available. Crop simulation models will probably evolve into valuable planning tools and may reduce somewhat the enormous logistical burden of planting numerous international nursery trials. Role of the Executive Management Committee (EMC; see ***Governance Mechanism*** section) is not clear; appears to have been dropped by 1987. IBSNAT coordination facilities at the University of Hawaii are inadequate, particularly for visitors. IBSNAT is one of the more costly networks. Budget for 1987-1992 is $10.4 million.

References:

Beinroth, F.H. 1987. Ag technology transfer aided by computers. *Front Lines* (U.S. Agency for International Development) 27(3): 13 (April).

IBSNAT Progress Report 1982-1985. 48 p.

Summary Papers of the Seminar on an Integrated Predictive Computer Package for Agrotechnology Transfer in the Developing Nations, Washington, D.C. 10-12 November 1986. IBSNAT, 15 p.

Report of the Midterm External Evaluation of the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) Project, 29 September to 4 October 1985. U.S. Agency for International Development, Bureau for Science and Technology, Office of Agriculture, Washington, D.C., 71 p.

IBSNAT. 1986. *IBSNAT: An International Partnership to Develop a Methodology for Planning Agricultural Development and Controlling Farming Outcomes in the Developing Nations*. 11 p.

International Benchmark Site Network for Agrotechnology Transfer, Project No. 936-4054: A Prototype Activity to Develop a *Decision Support System* for Overcoming Bottlenecks in Agroproduction Technology in the Tropical and Subtropical Regions Phase II. 122 p.

Project Evaluation Summary (PES)-Part 1: International Benchmark Sites (IBSNAT). 16 p.

IBSNAT'S Proposed Extension: Comments from Centers and Missions. 19 p.

Silva, J.A. (Editor) 1985. *Soil-Based Agrotechnology Transfer*. Benchmark Soils Project, University of Hawaii, Honolulu, 269 p.

ICRISAT. 1984. *Minimum Data Sets for Agrotechnology Transfer*. International Crops Research Institute for the Semi-Arid Tropics, Patancheru, India, 212 p.

Agrotechnology Transfer. Various issues.

IBSNAT. 1983. *International Benchmark Sites Network for Agrotechnology Transfer: A Systems Analysis and Crop Simulation Project*. 11 p.

File date: 1 February 1989

IBSRAM (International Board for Soils Research and Management)

Contact Person and Address: Director, IBSRAM, 6th Floor, Department of Land Development, Phaholyothin Rd., P.O. Box 9-109, Bangkhen, Bangkok 10900, Thailand. Tel. 5797590, 5791938; Telex 21505 IBSRAM TH; Fax 66-2-5611230.

Focus: Promote and assist applied soil research into the identification, development, use, management, and protection of soils and lands for food production and other agricultural or agroforestry purposes, so as to enhance and increase economically sustainable production in developing countries. To further these aims, IBSRAM supports training, information exchange, soil management networks, monitoring tours, and the maintenance of databases. Soil research networks include:

(a) management of vertisols under semiarid conditions (ICRISAT involvement; expected to be operational by July 1987),
(b) Acid Tropical Soils Management Network,
(c) land development and soil management in Asia and the Pacific (ASIALAND; funding being sought as of March 1987),
(d) providing technical advice and guidance to NARSs for adaptive research and practical training programs,
(e) encouraging and assisting coordinated interdisciplinary activities in order to develop, test and promote on-farm application of improved technologies,
(f) promoting the involvement of national agencies and citizens of developing countries in soil-related applied research and testing activities, and
(g) fostering cooperation in applied soil research between the developed and developing regions for their mutual benefit.

Year Started: Agreement to establish IBSRAM reached at a workshop entitled "Research to Resolve Selected Problems of Soil in the Tropics" of soil scientists held in Townsville, Australia, in September 1983.

Lead Institution: ACIAR, Canberra, Australia.

Legal Status/Formal Agreements: An agreement has been ratified with the Government of Thailand designating IBSRAM as an international, non-profit research organization.

Governance Mechanism: ***Board of Trustees*** composed of ten members, each appointed for 3 years. In addition the Director and a Thai representative sit on the Board as ***ex officio*** members. Board meets once a year. ***Director*** supervises day-to-day operations. Appointed by the Board of Trustees. ***IBSRAM Donor Support Group*** formed in May 1987 and is the official link between IBSRAM, the Board of Trustees, and donors. It advises the Board of Trustees

on management and policy matters and has the authority to conduct independent reviews of IBSRAM's programs.

Current Leadership/Coordination: M. Latham, IBSRAM Director, ORSTOM, France. IBSRAM's office is located in the Department of Land Development, Bangkok, Thailand. An executive committee of five members acts for the Board of Trustees.

Organizational Structure: Network coordinating committees for the four soil research and management networks have been established.

Number of Network Staff (FTE): Director, six professional staff (an adviser for Thai affairs, an administrative officer, an editor, and three network coordinators), seven support staff. During 1989, three more senior staff are to be recruited: a program officer, an officer for the service units, and an additional network coordinator.

Network Expenditures/Budget: Australian $248,096 (1984), A $569,500 (1985). US $1.9 million (1987).
The 1987 budget breaks down as follows:
US $741,000 core
US $1,125,000 restricted core
US $91,000 special project.
60% of budget for networking activities.

Funding Sources: IDRC, CIDA, and ODA provide 63% of funding. Other donors are AIDAB (Australian International Development Assistance Bureau), ACIAR (Australian Centre for International Agricultural Research), ADB, BMZ of FR Germany, EEC (CTA), French Ministry of Foreign Affairs, GTZ (German Agency for Technical Cooperation), USAID, ORSTOM (Office de la Recherche Scientifique Outre-Mer), Rockefeller Foundation, Swiss Aid, Thai government (through DLD), USAID, World Bank. The Director is paid by ORSTOM. The British Overseas Development Administration (ODA) has agreed to fund the coordination of the network on the Management of Vertisols under Semi-Arid Conditions. CIDA (Canadian International Development Association) has agreed to fund coordination of a network on the management of acid soils in humid Africa for 3 years.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Strategic plan has been elaborated for 1989-1993.

Network Publications: Newsletter in English sent to 3,000 recipients.

Workshops and Conferences: Yes

Network Training: Not specific to the soil management and research networks. IBSRAM promotes regular courses organized by FAO, ICRISAT, IITA, IRRI, and various universities.

Indicators of Impact/Performance: IBSRAM's soil research and management networks have spurred other soil-related collaborative research activities, e.g. a regional network entitled: Land Development and Management of Acid Soils in Africa, which has been funded by CIDA for 3 years. This regional network grew out of an IBSRAM session on Clearing and Management of Acid Tropical Soils in Douala, January 24-27, 1986.

Remarks: IBSRAM has initiated three collaborative soil management research networks. Data processing unit intends to establish direct telecommunication links between cooperators and headquarters in Bangkok. IBSRAM does not have any field stations or laboratory facilities.

References:

IBSRAM. 1984. *Removing Soil Constraints to Food Production.* IBSRAM Progress Report, May.

IBSRAM. 1985. *Report of the Inaugural Workshop and Proposal for Implementation of the Tropical Land Clearing for Sustainable Agriculture Network, August 27-September 2, 1985, Jakarta and Bukittinggi, Indonesia.* IBSRAM, 48 p.

IBSRAM. 1985. *Report of the Inaugural Workshop on Management of Vertisols for Improved Agricultural Production, ICRISAT Center, Patancheru, India, 18-22 February 1985.* 20 p.

IBSRAM. 1985. *Report of the Inaugural Workshop and Proposal for Implementation of the Acid Tropical Soils Management Network, April 24-May 3, 1985, Yurimaguas, Peru; Manaus and Brasilia, Brazil.* IBSRAM, 40 p.

IBSRAM. 1985. *IBSRAM Highlights 1985.* IBSRAM, Bangkok.

IBSRAM. 1986. *IBSRAM Progress Report, 1986.* 15 p.

IBSRAM. 1986. *Report of the IBSRAM Sessions Seminar on Lateritic Soils Materials and Ores: Land Development and Management of Acid Tropical Soils in Africa.* IBSRAM, 31 p.

IBSRAM Newsletter 5, March 1987.

IBSRAM Highlights 1987. IBSRAM, Bangkok.

TAC. 1988. Relations with non-associated centres: a preliminary desk analysis of information available in the TAC Secretariat. Technical Advisory Committee Secretariat, FAO, Rome, September (AGR/TAC:IAR/88/28).

File date: 29 January 1989

IBYAN (International Bean Yield Adaptation Nursery)

Contact Person and Address: Bean Program, Centro Internacional de Agricultura Tropical (CIAT), Apartado Aereo 6713, Cali, Colombia. Phone: (57-23) 675050 (Cali), 27344 (Palmira). Telex: 396-05769 CIAT CO. Cable: CINATROP. ITT Dialcom: 157:CG1301.

Year Started: 1976

Lead Institution: Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia.

Region: World

Countries in Network: 30

Indicators of Impact/Performance: As of 1983, IBYAN has launched 48 varieties. All bean selections leaving the second stage of the IBYAN network resist bean common mosaic virus and the nursery has helped locate lines that survive all known races of anthracnose *(Colletotrichum lindemuthianum)*, a worldwide highly destructive pest.

Remarks: International Nursery.

References:
CIAT. 1986. Bean research payoff in Costa Rica. *CIAT International* 5(2):3-5.

File date: 29 November 1987

ICLARM (International Center for Living Aquatic Resources Management)

Contact Person and Address: Director General, ICLARM, P.O. Box 1501, Makati, Manila, Philippines. Telex: ITT 45658 ICLARM PM. Phone: 818 0466, 818 9283, 817 5163, 817 5255.

Focus: Improving productivity of coastal and inland fisheries as well as aquaculture. ICLARM conducts and stimulates research on critical problems related to the exploitation, management, and utilization of living aquatic resources. Disciplinary approach is broad, ranging from basic biology to socioeconomics. ICLARM program areas are Resource Assessment and Management, Aquaculture, Education and Training, and Information. Some specific ICLARM activities include:

(a) fisheries stock assessment and management modules in Indonesia, Peru, the Philippines, and Zambia,
(b) development and wide dissemination of calculator and microcomputer programs and manuals for fisheries stock assessment and management,
(c) evaluation of small-scale fisheries management options in Asia and the Pacific,
(d) research and planning for integrated coastal resources management in ASEAN member states of Southeast Asia,
(e) genetics of major cultured freshwater species, especially tilapias, to develop improved strains and better broodstock and seed management practices,
(f) the integration of aquaculture systems into existing agriculture systems in a manner which encourages broad participation by small-scale farmers, and
(g) analysis of economic and policy issues to identify means to accelerating technology transfer and its adaptation.

Year Started: 1977

Member Institutions/Individuals: 600 individuals are part of the ICLARM-organized Network of Tropical Fisheries Scientists.

Region: Asia, Pacific, and Africa.

Countries in Network: 80, including Bangladesh, Indonesia, Malawi, Philippines, and Solomon Islands.

Legal Status/Formal Agreements: ICLARM is incorporated in the Philippines and works out Memoranda of Understanding with other countries in which it works.

Governance Mechanism: Board of Trustees (Chairman: Roy Jackson).

Organizational Structure: Headquarters in Manila, a regional office in the South Pacific (ICLARM's Coastal Aquaculture Center on Guadalcanal Island, Solomon Islands).

Network Expenditures/Budget: 1986 budget was $2.23 million.

Funding Sources: ***Unrestricted Core***--Australian Development Assistance Bureau, Ford Foundation, GTZ, the Royal Norwegian Agency for International Development (NORAD), Rockefeller Foundation, UNDP, and USAID. ***Special Projects/Cooperative Activities***--from unrestricted core sources and Danish International Development Agency (DANIDA), FAO, Asian Development Bank, IDRC, Kuwait Institute for Scientific Research, New Zealand, Planters Products, Inc., San Miguel Corporation, Skaggs Foundation, U.K. Overseas Development Agency, the United National University, and the World Bank.

Network Publications: Several--e.g. ***NAGA*** (3,500 on the subscription list), an ICLARM quarterly, and ***ICLARM Newsbriefs***. Also, ***Fishbyte*** is a medium for scientists to exchange information regarding current scientific work and new literature on fisheries, as well as latest research methodologies and forthcoming professional meetings.

Workshops and Conferences: Yes.

Network Training: Fellowships for post-graduate training are arranged from donors such as the Ford Foundation.

Indicators of Impact/Performance: More than 50 major scientific publications produced by ICLARM are in constant demand. Research methodologies in small-scale fisheries research developed by ICLARM are increasingly used around the world.

Remarks: Technically, ICLARM is an international center. But headquarter facilities are modest. ICLARM has no research laboratory of its own, and few staff members. ICLARM operates very much like a network by relying mostly on facilities and personnel of state/national, regional, and international centers. ICLARM has only six permanent senior professional staff in programs and administration and nine senior professionals on fixed-term contracts (one of the former and five of the latter are outposted). ICLARM faced severe financial difficulties in 1984 and 1985 and several staff vacancies remain to be filled pending adequate funding levels. There has been a shrinking of core support whereas specific-project funding has increased.

References:

Preparing for ICLARM's Second Decade: Program and Finances of the International Center for Living Aquatic Resources Management. ICLARM, Information No. 5, 1986, 54 p.

File date: 2 January 1988

ICLCD (International Committee on Land Clearing and Development in the Tropics)

Contact Person and Address: Dr. Lal, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Mailing address: c/o Ms. Maureen Larkin, L.W. Lambourn & Co., Carolyn House, 26 Dingwall Road, Croydon CR9 3EE, U.K. Telephone: 413440/413244/413315. Cable: TROPFOUND, IKEJA. Telex: 961-31417 or 20311 TDS IBA NG ATTN IITA Box 015.

Focus: Examine why large land clearing schemes in the tropics generally fail. Intend to produce a film showing proper and undesirable ways of land clearing in the tropics.

Year Started: 1982

Year Ended: 1985

Remarks: The functions of this network were effectively taken over by one of IBSRAM's networks entitled: Network on Tropical Land Clearing for Sustainable Agriculture.

File date: 5 February 1989

IIEN (IRRI Industrial Extension Network)

Contact Person and Address: Dr. Amir U. Khan, International Rice Research Institute (IRRI), P.O. Box 933, Manila, Philippines. Cable: RICEFOUND, MANILA. Telex: 40890 RICE PM.

Focus: Agricultural machinery for rice farmers with 2-10 ha of land. Machinery to be locally made.

Year Started: 1976

Year Ended: 1985 (see Remarks).

Lead Institution: International Rice Research Institute (IRRI), Los Banos, Philippines.

Member Institutions/Individuals: Mostly small- to medium-scale manufacturers of agricultural machinery and extension services of participating countries.

Number of Individuals Involved: >500

Region: Asia, Africa.

Countries in Network: Thailand, Indonesia, India, Burma, Philippines, and Egypt.

Funding Sources: USAID. Burmese participation supported by CIDA (Canadian International Development Agency).

Network Publications: Newsletter published until 1985.

Workshops and Conferences: Held at IRRI every 2-3 years.

Network Training: Courses held at IRRI with field trips to see small-scale agricultural machinery manufacturers in the vicinity of Manila and Los Banos. Training sessions are also arranged for farmers in the use and maintenance of machinery (e.g. in Thailand).

Indicators of Impact/Performance: 600,000 machines, particularly threshers, have been produced in ten countries.

Remarks: An agricultural machinery exchange network. IIEN is an outgrowth of the Agricultural Machinery Network (AMN). As of September 1985, USAID has stipulated that support for IIEN must come from AID missions in participating countries instead of from Washington as previously. Due to the increased administrative workload this would entail and uncertainties in funding, IIEN as a network is winding down. Pakistan participated in the network from 1976 to 1982. In 1986, IIEN activities continuing only in India and the Philippines.

References:

Reddy, V.R. 1984. IRRI industrial extension project in Indonesia from March 1978 to August 1984. Paper presented at a seminar on Industrial Extension sponsored by the Chinese Academy of Agricultural Mechanization Sciences, Beijing, People's Republic of China, October.

Bockhop, C.W., R.E. Stickney, M.M. Hammond, B.J. Cochran, V.R. Reddy, F.E. Nichols, and S.C. Laboro. 1985. The IRRI Industrial Liaison Program. Paper presented at the international conference on Agricultural Equipment for Developing Countries, 2-6 September, IRRI, Los Baos, Philippines.

Bockhop, C.W. 1984. The IRRI machinery development program. Paper presented at a seminar on Industrial Extension sponsored by the Chinese Academy of Agricultural Mechanization Sciences, Beijing, People's Republic of China, October.

Cochran, B.J. 1984. Implementation of mechanization to small rice farms in Thailand. Paper presented at a seminar on Industrial Extension sponsored by the Chinese Academy of Agricultural Mechanization Sciences, Beijing, People's Republic of China, October.

IRRI-PAK. 1981. ***IRRI-PAK Agricultural Machinery Program: Progress Report July 1976-June 1981***. International Rice Research Institute/Pakistan Agricultural Research Council, Islamabad, Pakistan, 36 p.

R.E. Stickney, B.C. Gonzalo, and C.W. Bockhop. 1984. Philippine agricultural engineering extension of small farm equipment. Paper presented at the 1984 summer meeting of the American Society of Agricultural Engineers, University of Tennessee, Knoxville, June 24-27.

NIAE. 1985. Review of the impact of the agricultural engineering component of the work of the CGIAR institutes. National Institute of Agricultural Engineering, Wrest Park, Silsoe, Bedford, England, 35 p.

File date: 30 November 1987

IIMI (Institut International de Management de l'Irrigation)

Contact Person and Address: IIMI, Digana Village via Kandy, Sri Lanka. Phone: (08) 74274, 74334. Telex: 223181 IIMIHQ CE.

Focus: Research and management of irrigation systems. IIMI maintains a database as a resource for irrigation researchers. Research is also conducted on socioeconomic constraints facing farmers using irrigation water, or with potential for connecting with irrigation systems.

Year Started: 1984

Region: World

Governance Mechanism: A National Consultative Committee Sri Lanka/IIMI has been formed under terms of reference drawn up by IIMI and representatives from the government of Sri Lanka. This committee is designed to assist IIMI in its research program by helping implement collaborative research activities and facilitating the interpretation of research results. Analogous consultative committees are envisaged in the countries with which IIMI conducts collaborative research. IIMI instigated the ***Irrigation Management Network*** which examines irrigation management strategies with a view to diversifying the number of crops that can be managed in irrigation systems. This network is currently operating in Sri Lanka, Indonesia, and the Philippines. Dr. Senen Miranda is the coordinator. A second IIMI-instigated network is in the works. This one, to be coordinated by Dr. Leslie Small, will study the mobilization of resources for improving irrigation performance. The third IIMI network is concerned with research on irrigation under peasant management.

Organizational Structure: Research is very decentralized; headquarters serves as resource center and coordinator. Research conducted mostly at national program sites. IIMI created a branch facility in Pakistan in 1986. IIMI has outposted two professional staff, one in the Philippines (Manila), the other in Indonesia (Jakarta).

Funding Sources: IIMI receives support from the following organizations/countries--Aga Kan Foundation, Asian Development Bank, Australia, France, Ford Foundation, IFAD, India, Japan, Netherlands, Pakistan, Philippines, Rockefeller Brothers Fund, Rockefeller Foundation, Sri Lanka, U.K., UNDP, U.S., and the World Bank.

Network Publications: IIMI publishes some research results.

Workshops and Conferences: IIMI has organized several international workshops on various aspects of irrigation research and management.

Network Training: IIMI offers fellowships for graduate study under the supervision of IIMI staff. IIMI supports post-docs; two were being supported in 1987, one in Sri Lanka, the other in Indonesia.

Remarks: Although IIMI is an institution, it operates very much like a network. In this regard it is similar to ICLARM. IIMI conducts all field research via collaboration with national programs since its headquarter facilities are very modest with no extensive fields and experimental plots for irrigation trials. IIMI sees two main advantages to the network approach: (a) collaborative approach fosters the strengthening of national programs, and (b) IIMI's research programs are exposed to a wide range of irrigation environments, far more than could be achieved at one research station.

References:

Cowell, R. *Irrigation Management Network*. ODI/IIMI Irrigation Management Network Paper F87/1b, March 1987, 21 p. (French version).

File date: 4 January 1988

INCOFORE (International Council for Forestry Research and Extension)

Contact Person and Address: Mr. Oscar Fugali, IUFRO, Vienna.

Focus: Forestry to meet demands for fuelwood, paper, construction materials, and fodder. Emphasis is on multipurpose trees. Aims include:

(a) to help national forestry research institutions in the developing countries,
(b) to help bilateral and multilateral donor agencies evaluate research needs and priorities,
(c) to mobilize funds for strengthening national forestry research and extension programs, and
(d) to encourage networking and coordination.

Year Started: 1983

Member Institutions/Individuals: Twenty-one identified for 1984 theme on South and Southeast Asia, 16 for Africa (see research focus).

Governance Mechanism: Board of councilors composed of panel of experts provides direction to network through review of annual work and budget plans. Board composed of six members from DCs and LDCs is to meet once a year. Five research coordinators (one senior coordinator and four leading research scientists. IUFRO (International Union of Forestry Research Organizations) to assist in selecting coordinators (IUFRO started informally in 1891 with inter-governmental status and was officially founded in 1929).

Current Leadership/Coordination: Regional coordinators arranged by IUFRO, e.g. for South and Southeast Asia the coordinator is a senior forestry research specialist from the Philippines.

Network Expenditures/Budget: Proposed 3-year budget for 1986-88 is $800,000.

Funding Sources: Since 1982, World Bank has provided $50,000/yr towards core funds. UNDP also provides funding. USAID and IDRC contributed to the costs of the 1984 workshop on South and Southeast Asia. UNESCO and the Swiss government have also provided some funding. World Bank committed $270,000 in 1986 to initiate network activities in Africa. UNDP, USAID, and the Swiss government have also expressed their intentions to provide some support for the network from FY1988 onwards.

Workshops and Conferences: Yes, organized around themes. 1984 workshop selected theme of multipurpose species for social forestry programs in South and Southeast Asia. Workshop to be

held in Nairobi in 1986 will have the same theme but will focus on Africa.

Network Training: Two forestry research, management, and planning courses to be offered.

Indicators of Impact/Performance: Network has organized five regional assessments of research needs in forestry and forest utilization through workshops and consultancies in Africa, Asia, and Latin America.

Remarks: This network substitutes for a new international center. ISNAR is the model for INCOFORE. Network used to be called SPDC, but the name was changed to INCOFORE in 1986 following the 18th World IUFRO Congress in Ljubljana, Yugoslavia. The network was also formalized in 1986.

References:

Schuh, G.E. 1985. Bank support for forestry research in Africa. World Bank memo to E. Stern, 23 December.

Spears, John. 1986. Briefing note on current status of INCOFORE (International Council for Forestry Research and Extension). World Bank memo to Guy Le Moigne, 17 October.

File date: 30 November 1987.

INGER (International Network on the Genetic Enhancement of Rice)

Contact Person and Address: Dr. D.V. Seshu, Global Coordinator, International Rice Research Institute (IRRI), P.O. Box 933, Manila, Philippines. Telex: 40890 RICE PM.

Focus: Screening rice germplasm for yield and other characteristics. INGER nurseries are grouped thus:

IRRIGATED

Yield

IRYN-VE	International Rice Yield Nursery-Very Early
IRYN-E	International Rice Yield Nursery-Early
IRYN-M	International Rice Yield Nursery-Medium

Observational

IRON-VE	International Rice Observational Nursery-V. Early
IRON-E	International Rice Observational Nursery-Early
IRON-M	International Rice Observational Nursery-Medium

RAINFED UPLAND

Yield

IURYN-E	International Upland Rice Yield Nursery-Early
IURYN-M	International Upland Rice Yield Nursery-Medium

Observational

IURON-E	International Upland Rice Observational Nursery-Early
IURON-M	International Upland Rice Observational Nursery-Medium

RAINFED LOWLAND

Yield

IRRSWYN-E	International Rainfed Rice Shallow Water Yield Nursery-Early
IRRSWYN-M	International Rainfed Rice Shallow Water Yield Nursery-Medium

Observational

IRRSWON-E	International Rainfed Rice Shallow Water Observational Nursery-Early
IRRSWON-M	International Rainfed Rice Shallow Water Observational Nursery-Medium
IRDWON	International Rice Deep Water Observational Nursery
IFRON	International Floating Rice Observational Nursery
ITPRON	International Tide-Prone Rice Observational Nursery

SPECIFIC STRESSES

Temperature

IRCTN	International Rice Cold Tolerance Nursery

Soil

IRSATON	International Rice Salinity and Alkalinity Tolerance Observational Nursery
	Acid Upland Soils Screening Set
	Acid Lowland Soils Screening Set

Diseases

IRBN	International Rice Blast Nursery
IRBBN	International Rice Bacterial Blight Nursery
IRTN	International Rice Tungro Nursery

Insects

IRBPHN	International Rice Brown Planthopper Nursery
IRWBPHN	International Rice Whitebacked Planthopper Nursery
IRSBN	International Rice Stemborer Nursery

Nematodes

IRUSS	International Rice Ufra Screening Set

Year Started: 1975

Lead Institution: IRRI, Los Banos, Philippines.

Number of Individuals Involved: >800

Region: World

Countries in Network: >80 (50-60 in any given year).

Number of Network Sites: 600

Early Leadership: IRRI

Organizational Structure: A central committee at IRRI is assisted by regional advisory committees. INGER coordinator for Africa is posted at IITA, Ibadan, Nigeria. INGER coordinator for Latin America and the Caribbean operated out of CIAT, Cali, Colombia.

Network Expenditures/Budget: $7.7 million for 5-year period 1980-84. For 4-year period commencing 1 May 1985, budget is $8.792 million.

Funding Sources: UNDP

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes, recording procedures in printed materials distributed with seed.

Network Publications: IRRI distributes preliminary and annual reports on results of nurseries.

Monitoring Tours: Two to three per year each with a theme or focus. 12-18 participants per monitoring tour.

Workshops and Conferences: Annual INGER conference in addition to workshops for smaller groups every 2 years.

Indicators of Impact/Performance: As of 1984, entries from 37 countries have resulted in the release of 77 varieties by numerous national programs. All told INGER has been responsible for the direct release of more than 120 varieties as of 1985. By the end of 1987, 161 entries originating from breeding programs of 17 countries and IRRI were released as varieties in 47 countries.

Remarks: INGER was formerly known as IRTP (International Rice Testing Program). IRTP's name was changed to INGER in 1989. INGER has characteristics of both a material exchange and a collaborative research network, particularly with respect to the highly specialized nurseries. INGER is a network for the exchange and evaluation of genetic materials in different environments. Number of nurseries in INGER varies annually from 25-28 (28 in 1981, 25 in 1985). Approximately 250,000 seed packets sent out from IRRI for INGER nurseries every year.

International Rice Blast Nursery (IRBN) started in 1965.
International Rice Yield Nursery (IRYN) started in 1972.
International Rice Observation Nursery (IRON) started in 1973.

References:

IRRI. 1979. ***International Rice Testing Program Activities: Annual Report***. IRRI, Los Banos, 25 p.

IRRI. 1983. ***IRTP 1983: Annual Report***. IRRI, Los Banos, 48 p.

IRRI. 1984. ***1984 Annual Report: The International Rice Testing Program.*** IRRI, Los Banos, 49 p.

IRRI. 1985. ***1985 Annual Report: The International Rice Testing Program.*** IRRI, Los Banos, 59 p.

IRRI. 1986. ***1986 IRTP Nurseries: Master Fieldbook***. IRRI, Los Banos, 159 p.

Seshu, D.V. 1986. ***An Overview of the International Rice Testing Program in Africa, 1975-85***. IRRI, Los Banos, 44 p.

Seshu, D.V. ***International Rice Testing Program--A Mechanism for International Cooperation in Rice Improvement Coordinated by the International Rice Research Institute.*** IRRI, Los Banos, 21 p.

Seshu, D.V. 1988. Research networks--a model for success. Cooperative Research Workshop, AVRDC, Taiwan, August 1988.

Rosero, M.J. 1985. IRTP network in Latin America and the Caribbean. Paper presented at the International Rice Research Conference, 1-5 June, 21 p.

UNDP. 1983. Report of the UNDP Mission of the UNDP-financed global project, the International Rice Testing and Improvement Programme, at the International Rice Research Institute, Los Banos, Philippines. November, 80 p.

IRRI. A proposal to the United Nations Development Programme for continuation of assistance to the global project, International Rice Testing and Improvement Program, for the 4-year period, May 1985 to April 1989. IRRI, Los Banos, 55 p.

File date: 21 August 1989

INIBAP (International Network for the Improvement of Bananas and Plantain)

Contact Person and Address: Director, Agriculture, Food and Nutrition Sciences, International Development Research Centre (IDRC), P.O. Box 8500, Ottawa, Canada KIG 3HP. Phone: (613) 236 6163. Telex: 053-3753. Headquarter of network at CIRAD (Centre International pour la Recherche Agricole et le Developpement), Montpellier, France.

Focus: Coordinate and stimulate research on improvement of bananas and plantains for domestic consumption within producing countries. Specific objectives are:

(a) to initiate, encourage, support, conduct, and coordinate research aimed at improving the production of bananas and plantains,
(b) to encourage the collection and exchange of documentation and information relating to bananas and plantains, and
(c) to support training for researchers and technicians from LDCs.

Year Started: 5 November 1984 approval date for establishment of INIBAP; in early 1985 a search was initiated for a Director.

Region: Four regional networks; one each for W. Africa, E. Africa, L. America, and Asia and the Pacific.

Entities in Network: ***NARSs:*** Brazil; Burundi; Guadalupe; Honduras; Jamaica; Taiwan, China; Nigeria; and the Philippines; ***IARCs, regional centers, and DC institutions:*** Australia (ACIAR), Costa Rica (CATIE), Kenya (ICIPE), France (CIRAD), and Panama (UPEB).

Governance Mechanism: ***Board of Trustees:*** Eleven members (interim Board was appointed during INIBAP's start up). Membership as follows: one host country nominee (ex officio), the Director (ex officio), five from banana and plantain producing countries, and five appointed on the basis of their scientific and managerial expertise. ***Director*** is appointed by the Board of Trustees. ***Executive Committee*** is composed of Chairman and Vice Chairman of the Board of Trustees, the Director, and one other trustee.

Early Leadership: IDRC, Ottawa, Canada.

Network Expenditures/Budget: $0.7 million (1987), $1.1 million (1988), $1.5 million (1989).

Funding Sources: France provides headquarter facilities and $80,000/year toward headquarter expenses. Belgium, France, and IDRC account for 98% of funds.

Network Publications: Newsletter, brochures, annual report, and workshop proceedings.

Workshops and Conferences: Yes, e.g. Workshop on Improvement of Bananas and Plantains, 13-17 October 1986.

Remarks: This is a center acting as a coordinator for networking activities as in the case of IBSRAM, IIMI, and ICLARM. Designed to promote collaborative research networks.

References:

International Network for the Improvement of Bananas and Plantain (INIBAP), Support Group Meeting, Washington, November 5, 1984. 8 pp. plus appendices.

CGIAR. 1988. Consultative Group Meeting, May 16-20, 1988, Berlin: Agenda Item 9 (MT 88/017, March 31, 1988).

File date: 29 January 1989.

INSURF (International Network on Soil Fertility and Sustainable Rice Farming)

Contact Person and Address: Dr. Cezar P. Mamaril, Agronomist, International Rice Research Institute (IRRI), P.O. Box 933, Manila, Philippines. Cable: RICEFOUND, MANILA. Telex: 40890 RICE PM.

Focus: Integrated nutrient management and long-term fertility studies in irrigated, rainfed lowland and upland rice environments; maintenance/enhancement of soil fertility for sustainable rice production.

Year Started: 1976 (name changed to INSURF in 1987).

Lead Institution: International Rice Research Institute (IRRI), Los Banos, Philippines, and the International Fertilizer Development Center (IFDC), Muscle Shoals, Alabama.

Number of Individuals Involved: 71

Region: South and Southeast Asia, Sub-Saharan Africa, and Latin America.

Countries in Network: Bangladesh, Burma, Cameroon, China, Colombia, Cuba, Dominican Republic, India, Indonesia, Liberia, Madagascar, Malaysia, Nepal, Nigeria, Pakistan, Peru, Philippines, Senegal, Sri Lanka, Thailand, and Viet Nam).

Number of Network Sites: Varies every year; up to 100

Governance Mechanism: Advisory Committee composed of representatives from IRRI, IFDC, IFDC, SDC, and selected senior scientists from collaborating countries and from advanced research organizations.

Current Leadership/Coordination: IRRI

Number of Network Staff (FTE): Twelve (one senior agronomist, one senior research assistant, two research assistants, four research aides, one secretary, three laborers) for 3 years.

Network Expenditures/Budget: $340,000

Funding Sources: Swiss Development Cooperation (SDC).

Common Network Plan/Strategy: The strategy of the network is a collaborative partnership between IRRI and the national programs in the area of soil fertility management research and the development of technologies for greater sustainability in rice production. IRRI provides experimental materials, some technical

expertise and coordination and the national program collaborators conduct the experiments using their own resources.

Common Research Methodology: The network includes several trials which may be carried out by the collaborators according to their interests. These trials are designed by representative network collaborators and resource scientists from research organizations of advanced countries based on recent findings. The same methods are followed by all collaborators and are outlined in a fieldbook sent along with experimental materials.

Planning Procedures: Planning meetings have been held annually since 1980 and hosted by the various participating countries where the monitoring tours and workshops are held. Collaborators from different countries and representatives from IRRI, IFDC, research organizations from advanced countries, and SDC attend the meetings.

Network Publications: Progress reports, with brief interpretation, are prepared annually for each trial. Proceedings of the annual workshop, as well as the other scientific papers and publications, are circulated among the various national programs and other interested parties.

Monitoring Tours: Yes

Workshops and Conferences: Yes

Network Training: As of 1988, a total of 201 trainees from 24 countries have attended the annual INSURF Training Course since 1979.

Indicators of Impact/Performance: Improved nitrogen fertilizer use efficiency in rice by farmers and the awareness for better balanced fertilizer application in lowland rice.

Remarks: Formerly called INSFFER (International Network on Soil Fertility and Fertilizer Evaluation of Rice).

References:

Network seeks increased fertilizer efficiency in rice. IRRI Reporter 3/81, September 1981, pp. 1-2.

Mamaril, C.P. 1986. **Report on the INSFFER Collaborators' Meeting in Indonesia, January 21-22, 1986.** IRRI, Los Baos, 85 p.

Mamaril, C.P. 1985. International and national cooperation in long-term coordinated schemes of experimentation on fertilizers. In: ***Proceedings of the 19th Colloquium of the International Potash Institute on Potassium in the Agricultural Systems of the Humid Tropics,***

25-29 November, Bangkok, pp. 287-295, International Potash Institute, Bern, Switzerland.

Mamaril, C.P. 1984. The INSFFER program: its role in rice production. In: *Proceedings of the ASEAN Soil Conference, Bangkok, Thailand, 10-23 June*, S. Panichapong, C. Niamskul, A. Promprasit, M. Newport (Eds.), pp. J3.1-15, Department of Land Development, Ministry of Agriculture and Co-operatives, Bangkok, Thailand.

Mamaril, C.P. 1986. *Report on the INSFFER Collaborators' Meeting in Indonesia, January 21-22, 1986*. IRRI, Los Banos, Laguna, Philippines.

Mamaril, C.P., S.K. De Datta, and R.R. Villapando. 1986. Results of INSFFER rainfed lowland trials. In: *Progress in Rainfed Lowland Rice*, pp. 103-112, IRRI.

Mamaril, C.P., R.B. Diamond, V.N. Cacnio, D.I. Estrella, and B.D. Lasco, Jr. 1986. Summary of INSFFER Collaborative Research Trials for 1985. Paper presented during the INSFFER Planning Meeting in Hangzhou, China, September 22-25, 1986.

Mamaril, C.P., R.B. Diamond, R.R. Villapando, and V.C. Cacnio. 1987. Fertilizer Evaluation for Rice, pp. 205-222, IRRI.

IRRI. 1987. *Efficiency of Nitrogen Fertilizer for Rice*. IRRI, Los Banos, Philippines.

Mamaril, C.P., V.N. Cacnio, D.I. Estrella, and B.D. Lasco, Jr. 1987. Summary of INSFFER Collaborative Trials for 1986. Paper presented during the INSFFER Planning Meeting in New Delhi.

File date: 1 February 1989

International Maize Improvement Network

Contact Person and Address: Maize Program, Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), P.O. Box 6-641, Mexico 06600, D.F. Mexico. Phone: (52-5) 954-2100 or (905) 761-3855. Telex: 1772023 CIMTME. Cable: CENCIMMYT. E-mail: 157:CGI801.

Focus: Testing maize germplasm to develop improved varieties. The program consists of three levels of testing:

1. International Progeny Testing Trials (IPTTs).
2. Experimental Variety Trials (EVTs).
3. Elite Variety Trials (ELVTs).

Lead Institution: CIMMYT

Region: World

Countries in Network: >70

Common Research Methodology: Yes. IPTT is composed of 250 full-sib families from each advanced population in CIMMYT's maize breeding program and six check varieties. Based on across-site analysis, 80-100 families are selected to regenerate the population for the next cycle of improvement. In addition, the superior ten families from each IPPT testing site and the ten best across-site families are also identified from the IPTT data and used to develop experimental varieties (EVTs). EVTs enter the next stage of the international testing system and are dispatched to cooperators who request them. After data from the EVTs have been returned to CIMMYT for analysis, the superior performing EVTs are selected and used to prepare the elite variety trial (ELVT) which is again distributed to cooperators upon request. The ELVT is the last stage in CIMMYT's international maize testing program. It is then up to national programs to selected materials for further breeding or direct release.

Planning Procedures: Yes

Indicators of Impact/Performance: Forty-three national programs have released 147 varieties and hybrids arising out of the CIMMYT Maize Improvement Network. In 1983, about 5 million hectares of maize with significant amounts of CIMMYT germplasm were grown in developing countries. About half of the 5 million ha was in Mexico, 1 million ha was in Asia, and 0.5 million ha each in Africa, S. America, and C. America.

Remarks: A material exchange network; international nursery. The International Maize Improvement Network has developed and tested over 850 experimental varieties during 1975-1985 period.

References:

CIMMYT. 1986. ***Mainstreams of CIMMYT Research: A Retrospective.*** CIMMYT, El Batan, Mexico, p. 37.

Vasal, S.K., A. Ortega, and S. Pandey. 1982. ***CIMMYT's Maize Germplasm Management, Improvement, and Utilization Program.*** CIMMYT, El Batan, Mexico.

Sprague, E.W. and R.L. Paliwal. 1984. CIMMYT's maize improvement programme. ***Outlook on Agriculture*** 13(1):24-31.

File date: 28 November 1987

International Wheat Nurseries Program

Contact Person and Address: Maximino Alcala, Head, International Wheat Nurseries, Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), P.O. Box 6-641, Mexico 06600, D.F. Mexico. Phone: (52-5) 954-2100 or (905) 761-3656. Telex: 1772023 CIMTME. Cable: CENCIMMYT. E-mail: 157:CGI201.

Focus: Testing wheat germplasm for high yield and wide adaptability as well as resistance to diseases and tolerance to adverse soils.

Year Started: Individual nurseries started at different times going back to at least the early 1960s.

Lead Institution: CIMMYT

Member Institutions/Individuals: Varies; number of cooperators ranged from 257 to 307 between 1977-1984.

Region: World

Countries in Network: Varies, in 91-115 range.

Number of Network Sites: >150

Early Leadership: CIMMYT

Current Leadership/Coordination: CIMMYT

Indicators of Impact/Performance: Over 400 modern varieties have been released by national programs as of 1986. Semi-dwarf wheats, not all of which are derived from CIMMYT germplasm, cover over 50 million hectares in developing countries. Semi-dwarfs combined with extrinsic factors such as fertilizers, irrigation, etc. have raised wheat grain production by 25 million tons/year, enough to feed 250 million people.

Remarks: A combined nursery for bread wheat, durum wheat, triticale, and barley. Number of individual nurseries in the overall nursery program varied from 31 to 50 during the 1977-1984 period. The International Bread Wheat Screening Nursery (IBWSN) is the principal nursery which started in 1967. IBWSN tests several hundred of the highest yielding and most disease-resistant lines selected in the Mexico-based breeding program (Toluca and Ciudad Obregon sites). Seed of these lines is distributed to around 200 sites worldwide, although the precise number of locations varies somewhat from year to year. Best lines are cycled back into CIMMYT based breeding program in Mexico. Several disease screening nurseries--Regional Disease and Insect Screening Nursery (RDISN) is administered from Cairo, Egypt in

cooperation with ICARDA, while the Latin American Disease and Insect Screening Nursery (VEOLA) is administered from Quito, Ecuador. Lines for these nurseries are obtained from national programs in the respective regions. Best lines made available to all cooperating nations for use in their programs and are also cycled into CIMMYT's Mexico based program. The International Spring Wheat Rust Nursery (ISWRN), started in the 1960s, is administered by the USDA, and is another excellent source of disease-resistant wheat germplasm for CIMMYT and developing countries. Two early-warning, disease monitoring nurseries--the Regional Disease Trap Nursery (RDTN) and the Latin American Rust Nursery (ELAR). Aim is to detect changes in pathogen virulence as early as possible to forewarn countries of the need to replace susceptible varieties. International Spring Wheat Yield Nursery (ISWYN) distributed to some 150 locations worldwide. 19th ISWYN distributed in 1982.

References:

Dubin, H.J. and S. Rajaram, 1982. The CIMMYT's international approach to breeding disease-resistant wheat. ***Plant Disease*** 66(10):967-971.

CIMMYT. 1986. ***Veery 'S': Bread Wheats for Many Environments.*** CIMMYT, Mexico, pp. 9, 13, 15.

CIMMYT. 1986. ***Mainstreams of CIMMYT Research: A Retrospective.*** CIMMYT, Mexico, p. 38.

File date: 1 February 1989

INTSOY (International Soybean Program)

Contact Person and Address: Harold E. Kauffman, Director, INTSOY, College of Agriculture, University of Illinois at Urbana-Champaign, 113 Mumford Hall, 1301 W. Gregory Drive, Urbana, Illinois 61801. Phone: (217) 333-6422. Telex: 206957.

Focus: INTSOY is a multipurpose commodity network. INTSOY once served as a clearinghouse for a worldwide system for soybean germplasm. The international nursery part of INTSOY is called ISVEX (International Soybean Variety Experiment) and was started at the inception of INTSOY in 1973. It was terminated in 1985 with 132 countries having participated in ISVEX. By 1986, INTSOY had completely shifted the focus of its work to finding new ways to process and use soybeans as human and livestock food. INTSOY is now concentrating on a three-phase soybean utilization effort for the period 1985-1991 as follows:

Phase One: Intensified research to develop new soy products and processes.

Phase Two: Development of simple "how to" manuals and equipment lists for less developed countries and entrepreneurs interested in production of soy foods on a small or large commercial scale.

Phase Three: On-site technical assistance in soybean utilization for governments and private firms in less developed countries. Primary goal is to improve human nutrition through increased use of whole soybeans. Some specific programs/projects include:

(a) collaboration with the Department of Food Science at the University of Illinois to develop new ways to process and use whole soybeans for human food,
(b) combined soybean/grain, soybean/vegetable, and soybean/fruit foods produced by extrusion cooking,
(c) a simple low-cost process to produce a high-quality soymilk with no patent restrictions,
(d) immature green soybeans as a commercially viable high-protein green vegetable,
(e) simple processes for converting soybean residues into animal feed, and
(f) home- and village-level procedures for preparing soybean products for home consumption.

Year Started: 1973

Year Ended: The international nursery portion (ISVEX) terminated in 1985.

Lead Institution: University of Illinois at Urbana-Champaign.

Member Institutions/Individuals: 238 national and international organizations/institutions.

Number of Individuals Involved: 1,000 soybean scientists.

Region: World

Countries in Network: 132, including Argentina, Australia, Bangladesh, Brazil, Cameroon, Canada, China, Colombia, Cote d'Ivoire, Cuba, Ecuador, France, Guyana, Honduras, India, Indonesia, Korea, Libya, Mexico, Nepal, Nigeria, Panama, Peru, Philippines, Puerto Rico, Senegal, Spain, Sri Lanka, Sweden, Tanzania, Thailand, Uganda, U.S., U.S.S.R., Venezuela, Vietnam, Zaire, Zambia, and Zimbabwe.

Number of Network Sites: One regional center in Africa, Asia, and Latin America.

Legal Status/Formal Agreements: Informal

Governance Mechanism: Informal with the University of Illinois.

Early Leadership: University of Illinois, Urbana-Champaign and the University of Puerto Rico, Mayaguez.

Current Leadership/Coordination: University of Illinois at Urbana-Champaign.

Organizational Structure: Headquarter at University of Illinois at Urbana-Champaign. (ISVEX, the international nursery component of INTSOY, grew sufficiently large and complex that it was divided into separate tropical, subtropical, and temperate trials; now, however, international nurseries have been dropped from INTSOY). The following information is of historical interest, because international nurseries have been dropped from INTSOY: ISVEX, like IRRI's INGER and CIMMYT's wheat and maize nurseries, operates at different levels:

Soybean International Experimental Variety Evaluation (SIEVE). Established in 1978 as one of two nurseries to pre-sort the growing volume of entries submitted to ISVEX. Newly nominated varieties are tested at three latitudes. In SIEVE trials, materials are classified and promising entries make it to the next level of testing, SPOT trials.

Soybean Preliminary Observation Trials (SPOT). Best performing SIEVE entries are entered into SPOT for further testing at 18 sites in 9 environmental zones. In 1984, SIEVE and SPOT were amalgamated into the International Soybean Observation Trial (ISOT). Only the best performing entries in ISOT are advanced in ISVEX. ISVEX program terminated in 1985.

Number of Network Staff (FTE): From Food Science: five PhDs, one MS, two technicians. Agricultural Communication and Extension Education: one MS. Agricultural Economics: 1 Ph.D. Administration: 1 Director, 1 Secretary.

Funding Sources: USAID (80%), Private Industry (10%), Foundations (10%)

Network Publications: Twenty-nine monographs, including reports, germplasm listings, and conference proceedings.

Workshops and Conferences: Yes, an international workshop on soybean rust in the Philippines in 1977. INTSOY has cosponsored international research conferences in Colombia, Egypt, Ethiopia, Indonesia, Puerto Rico, Sri Lanka, and Thailand.

Network Training: Yes, e.g. course on Soybean Processing for Food Use has been offered 11 times since 1975, with more than 200 participants from 40 countries having taken the course. Another course, Technical and Economic Aspects of Soybean Production, has been taught to more than 100 participants from 46 less developed countries. This course has also been offered nine times since 1975.

Indicators of Impact/Performance: INTSOY has collected, evaluated, and distributed approximately 2,000 soybean cultivars and breeding lines from 34 countries, adding the most valuable cultivars to the USDA germplasm collection. INTSOY has helped establish national soybean programs in India, Peru, and Sri Lanka. As a result of collaborative activities between INTSOY and the Soyabean Foods Research Centre of Sri Lanka, several small-scale commercial enterprises are flourishing in Sri Lanka by selling affordable soy products such as soy flour, soy milk, and protein-enriched baby food.

Remarks: INTSOY started at the University of Illinois as an international nursery (International Soybean Variety Experiment--ISVEX), but it has evolved into a multipurpose commodity network that operates as a scientific consultation network in some projects and a collaborative research network in other endeavors. INTSOY modeled its nursery trial system after CIMMYT's and IRRI's international germplasm testing networks. INTSOY dropped the international nursery portion of its program in 1985, ostensibly because it had been proven that soybean varieties can be produced for a wide range of environments in the tropics, subtropics, and temperate areas (INTSOY probably dropped the international nursery component due mainly to pressure from the American Soybean Association which felt that INTSOY should focus more on utilization of soybeans). But what mechanism is now in place for further germplasm screening of soybean germplasm on a large scale to help breeders overcome future environmental

challenges to soybean production? International nurseries need to be on-going operations, unlike some networks that can be disbanded once a specific problem has been successfully tackled.

INTSOY is one of the larger and older agricultural research networks. Complete remodelling of INTSOY laboratories and other facilities at University of Illinois is scheduled for completion by 1988; the renovated facility will be called the Agricultural Bioprocesses Laboratory.

References:

International Soybean Program: INTSOY. Pamphlet published by the College of Agriculture, University of Illinois at Urbana-Champaign.

International Agriculture Update. College of Agriculture, University of Illinois at Urbana-Champaign, various issues.

The Soybean Solution: Meeting World Food Needs. INTSOY, College of Agriculture, University of Illinois at Urbana-Champaign, 1986, 27 p.

Some Value-Added Uses for Soybeans: A Briefing Document. INTSOY, College of Agriculture, University of Illinois at Urbana-Champaign, no date (c. 1987), no pagination.

File date: 1 February 1989

IPBN (International Plant Biotechnology Network)

Contact Person and Address: Colorado State University, Department of Botany, Fort Collins, CO 80523. Phone: (303) 491-6996.

Focus: Tissue culture, protoplast technology, and somatic embryogenesis related to the development of crop varieties with enhanced tolerance to environmental stresses.

Countries in Network: U.S., Philippines, Mexico, Pakistan, India, Morocco, Bangladesh, Thailand, Indonesia, Panama, and Costa Rica, among others.

Network Publications: Newsletter

Workshops and Conferences: First annual conference held in Fort Collins, Colorado, U.S.A., from 21-25 October 1985.

Network Training: Yes

Remarks: Essentially a mailing list operation rather than a collaborative research network.

File date 30 November 1987

IPMAT (International Pearl Millet Adaptation Trial)

Contact Person and Address: J.R. Witcombe, Cereals Program, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN. Cable: CRISAT, Hyderabad. E-Mail: 157:CGI505.

Focus: Evaluation of yield potential and ecogeographical adaptation of diverse genotypes.

Year Started: 1975

Lead Institution: ICRISAT

Member Institutions/Individuals: ICRISAT and cooperating centers.

Number of Individuals Involved: A project scientist and a research associate (part-time) from ICRISAT, and a scientist (part-time) from each cooperating center.

Region: South Asia and Africa.

Countries in Network: Varies up to eight (India, Pakistan, Malawi, Nigeria, Senegal, Sudan, Uganda, and Zambia).

Number of Network Sites: Variable from year to year (see Remarks).

Legal Status/Formal Agreements: Informal consent of cooperators.

Governance Mechanism: ICRISAT Pearl Millet Program assembles the trial with its own and cooperators entries, distributes the trial, analyzes the data, prepares the report, and distributes it to all cooperators.

Early Leadership: ICRISAT Pearl Millet Program.

Current Leadership/Coordination: ICRISAT Cereals Program.

Organizational Structure: IPMAT is a research project of ICRISAT Cereals Program on pearl millet breeding.

Number of Network Staff (FTE): (See Number of Individuals Involved above).

Network Expenditures/Budget: ICRISAT Pearl Millet Project Budget.

Funding Sources: ICRISAT Cereals Program.

Common Network Plan/Strategy: Evaluation of ICRISAT and Cooperators' genopytpes in diverse pearl millet growing environments.

Common Research Methodology: Replicated trial for yield and adaptation.

Planning Procedures: (See Governance Mechanism above).

Network Publications: 14

Monitoring Tours: Limited and occasional.

Workshops and Conferences: None

Network Training: None

Indicators of Impact/Performance: The extent of utilization of selected genotypes in local breeding programs in large-scale testing in the cooperators' mandate areas for release to farmers.

Remarks: An international nursery network. Number of locations and countries involved in IPMAT varies from year to year. Also IPMAT does not appear to operate every year, e.g. 1982. In 1981 (IPMAT 7) entries sent to 47 locations in 14 countries (although feedback was received from 25 locations in 8 countries). In 1983, (IPMAT 8) sent entries to 21 locations in 3 countries (results received from 19 locations in 3 countries).

References:

MB 5.19 Estimates of stability for comparing varieties. J.R. Witcombe. *Euphytica* (in press) 1988.

MB 8.27 The Variability in the Yield of Pearl Millet Varieties and Hybrids in India and Pakistan. J.R. Witcombe. Paper presented at the IFPRI/DSE Workshop on Sources of Increased Variability in Cereal Yields, Feldafing, Germany, November 26-29, 1985.

MB 9.1 Results of First International Pearl Millet Yield Trials 1975. ICRISAT, 1976.

MB 9.3 Results of the Second International Pearl Millet Adaptation Trial (IPMAT-2), 1976. ICRISAT, 1977.

MB 9.4 Results of the ICRISAT 1976 Pearl Millet Hybrid and Inbred Performance Trial. R.P. Jain and B.W. Hare, ICRISAT, 1977.

MB 9.5 Results of the Third International Pearl Millet Adaptation Trial (IPMAT-3), 1977. ICRISAT, 1978.

MB 9.6 Report of the Fourth International Pearl Millet Adaptation Trial (IPMAT-4), 1978. ICRISAT, 1979.

MB 9.7 Results of the Fifth International Pearl Millet Adaptation Trial (IPMAT-5), ICRISAT, 1979.

MB 9.8 Report of the Sixth International Pearl Millet Adaptation Trial (IPMAT-6), ICRISAT 1980.

MB 9.14 Report of the Seventh International Pearl Millet Adaptation Trial (IPMAT 7), 1981. ICRISAT, Patancheru, India, MB 9.14, 49 p.

ICRISAT. 1983. The Eighth International Pearl Millet Adaptation Trial (IPMAT 8), 1983. ICRISAT, Patancheru, India, MB 9.16, 52 p.

MB 9.18 Report of the Ninth International Pearl Millet Adaptation Trial (IPMAT-9), 1984. ICRISAT, November 1985

MB 9.21 Report of the Tenth International Pearl Millet Adaptation Trial (IPMAT-10), 1985. ICRISAT, October 1987.

MB 9.22 Report of the Eleventh International Pearl Millet Adaptation Trial (IPMAT-11), 1986.

File date: 31 January 1989

IPMDRTP (International Pearl Millet Disease Resistance Testing Program)

Contact Person and Address: Pearl Millet Program, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN. Cable: CRISAT, Hyderabad. E-Mail: 157:CGI505.

Focus:

(a) To test for resistance,
(b) to monitor variations in pathogen populations, and
(c) to provide resistant sources to cooperating scientists.

Four disease nurseries in IPMDRTP:

(a) International Pearl Millet Downy Mildew Nursery (IPMDMN) was established in 1974, four countries (India, Senegal, Niger, Nigeria), up to twenty locations.
(b) International Pearl Millet Rust Nursery (IPMRN), established in 1978, seven locations within India.
(c) International Pearl Millet Smut Nursery (IPMSM), seven locations in three countries (India, Senegal, Niger).
(d) International Pearl Millet Ergot Nursery (IPMEN), five locations in two countries (India, Senegal).

Year Started: 1976

Lead Institution: ICRISAT

Region: Africa and India.

Countries in Network: Four

Remarks: International nursery.

References:

ICRISAT. 1983. ***International Pearl Millet Disease Resistance Testing Program (IPMDRTP): Report of the Eighth (1983) International Pearl Millet Downy Mildew Nursery (IPMDMN).*** ICRISAT, Patancheru, India, Progress Report MP 105, 19 p.

ICRISAT. 1984. ***International Pearl Millet Disease Resistance Testing Program (IPMDRTP): Report of the Eighth (1984) International Pearl Millet Rust Nursery (IPMAN).*** ICRISAT, Patancheru, India, Progress Report MP 113, 12 p.

ICRISAT. 1985. ***International Pearl Millet Disease Resistance Testing Program (IPMDRTP): Report on the Ninth (1985) International Pearl Millet Ergot Nursery (IPMEN)***. ICRISAT, Patancheru, India, Progress Report MP 9.42, 24 p.

ICRISAT. 1985. ***International Pearl Millet Disease Resistance Testing Program (IPMDRTP): Report on the Ninth (1985) International Pearl Millet Smut Nursery (IPMSN)***. ICRISAT, Patancheru, India, Progress Report MP 9.43, 17 p.

File date: 29 November 1987

International Witches' Broom Project (IWBP)

Contact Person and Address: Dr. Hank Purdy, Department of Plant Pathology, IFAS, University of Florida, Gainesville, FL 32611.

Focus: Develop improved management practices to reduce economic losses from witches' broom *(Crinipellis perniciosa)*, a major disease of cacao.

Specific objectives:

(a) epidemiological analysis of the disease,
(b) evaluation of chemicals that might be effective against the disease,
(c) evaluation of phytosanitary practices, and
(d) disease gradient experiments.

Year Started: 1985

Region: S. America and Trinidad.

Countries in Network: Brazil, Colombia, Ecuador, Trinidad, and Venezuela.

Number of Network Sites: 11

Early Leadership: Hank Purdy (University of Florida), Pablo Buritica (Colombia), Chery Goncalves (Trinidad).

Current Leadership/Coordination: Each participating country has a coordinator to manage the activities at the research sites.

Network Expenditures/Budget: $700,000 for 5 years starting in 1985.

Funding Sources: International Office of Cocoa, Chocolate, and Confectionary Sugar (IOCCC).

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes

Network Publications: Yes (reports)

Network Training: No

Remarks: Although only funded in 1985, groundwork for the project was laid in 1981 when a group of interested scientists began to meet informally. It has been suggested that this network could serve as a model for furthering work on other cacao diseases, such as pod rot *(Moniliophthora roreri)*.

References:
Purdy, L.H. The International Witches' Broom Project, a model for progress through cooperation.

File date: 14 June 1989

MIRCENs (Micro-Biological Resources Centers)

Contact Person and Address: United Nations Environment Programme, P.O. Box 30522, Nairobi, Kenya.

Focus: Microorganisms involved in biological nitrogen fixation and fermentation (industrial, alcohol production). Biocontrol of pests. Specific objectives include:

(a) collection and maintenance of microbial genetic resources in reliable culture collections is a major objective,
(b) microbial processes to enhance soil fertility,
(c) energy production from agroindustrial waste,
(d) degrade persistent pollutants, and
(e) biocontrol of agricultural pests and disease vectors.

Year Started: 1976

Region: World, mainly developing countries.

Countries in Network: Six MIRCENs have been established with regional responsibilities (Brazil, Egypt, Guatemala, Kenya, Senegal, and Thailand). NifTAL/University of Hawaii and the Cell Culture and Nitrogen Fixation Laboratory at Beltsville, MD, U.S. are also involved.

Current Leadership/Coordination: UNESCO/UNEP.

Organizational Structure: MIRCENs are organized as regional programs. Nairobi MIRCEN covers E. Africa, Cairo MIRCEN located at Ain Shams University is concerned with linking researchers in the Middle East, Bangkok MIRCEN (Southeast Asia), MIRCEN at Porto Alegre, Brazil is for Latin America. MIRCENs anticipated for Dakar for Francophone West Africa, Guatemala City for Central America. Another MIRCEN slated for Hawaii at the University of Hawaii as well as NifTAL, Beltsville, Maryland. Bangkok, Cairo, and Guatemala MIRCENs emphasize biotechnology, waste recycling, and biocontrol of pests. MIRCEN activities have apparently been adversely affected by the pronounced cutback of U.S. support to UNESCO (presumably U.K.'s funding cut off to UNESCO has also negatively affected MIRCENs).

Funding Sources: UNEP/UNESCO.

Network Publications: Newsletters published by each MIRCEN (see Remarks).

Network Training: Organized by each MIRCEN. More than 300 people have been trained.

Remarks: Idea to set up MIRCENs originated with UNEP in 1973, following a recommendation of the Stockholm Conference on the Human Environment which called more attention to the conservation of genetic resources.
MIRCENs work closely with the World Data Centre on Microorganisms at the Institute of Physical and Chemical Research (RIKEN) in Japan. MIRCENs have spawned a subnetwork entitled the International Microbial Strain Data Network (MDSN) at the Biotechnology Centre, Cambridge University, UK. MIRCENs are not yet working in recombinant DNA technologies.

References:

MIRCEN NEWS No. 8, July 1986, 125 p.

Keya, S.O., J. Freire, and E.J. DaSilva. 1987. A global network of microbial resource centres. ***Development: Seed of Change*** 4:81-85

Juma, C. 1989. ***The Gene Hunters***. Zed Books, London/Princeton University Press, Princeton, pp. 118-119.

File date: 29 January 1989.

NifTAL (Nitrogen Fixation by Tropical Agricultural Legumes)

Contact Person and Address: Dr. B. Ben Bohlool, Director, NifTAL Project, College of Tropical Agriculture and Human Resources, Department of Agronomy and Soil Science, University of Hawaii, 1000 Holomua Avenue, Paia, Hawaii 96779. Phone: (808) 579-9568. Telex: NifTAL 7430315. BITNET.

Focus: Goal is to reduce dependence of small farmers on costly nitrogen fertilizers. NifTAL seeks to reinforce biological nitrogen fixation research in developing nations by filling gaps not covered by international and regional agricultural research centers. Has a service, research, and training function. NifTAL operates the International Network of Legume Inoculation Trials (INLIT). Research activities will include seeking biotechnological solutions to problems that have blocked full utilization of biological nitrogen fixation by small farmers in developing nations. In 1987, NifTAL also spawned a subnetwork, WREN (World-wide Rhizobial Ecology Network), which has been set up to better understand the ecological dynamics of *Rhizobium* when it is a free-living soil microorganism and when in symbiotic association with legumes. Nineteen nations are involved in WREN, and the new network published its first newsletter in 1987 as part of the overall NifTAL project. Plan to aid small businesses and private entrepreneurs in developing nations to establish inoculum production and marketing capabilities for biological nitrogen fixation technologies. A major project at NifTAL is microbial ecology in tropical soils which seeks to learn more about the effect of tropical soil conditions on the fate of introduced organisms (NSF grant). Major project proposal for 1987-1992 is *Agricultural Biotechnologies for Sustained Food and Fuelwood Production in the Tropics.*

Year Started: 1975

Year Ended: Projected to end in 1991.

Lead Institution: University of Hawaii

Member Institutions/Individuals: 200 scientists in the LDCs participate in NifTAL's International Network of Legume Inoculation (INLIT).

Region: Global

Countries in Network: Fifty-three nations participate in INLIT.

Number of Network Sites: 200+

Governance Mechanism: NifTAL monitored by Dr. Lloyd R. Frederick, S&T/AGR/RNR, SA-18, U.S. Agency for International Development, Washington, D.C. 20523.

Early Leadership: University of Hawaii

Current Leadership/Coordination: University of Hawaii

Organizational Structure: Since 1983, NifTAL has operated a Regional Resource Center in Bangkok, Thailand. Plan to open similar Regional Resource Centers in Africa (Kenya or Senegal), and Latin America (Costa Rica or Honduras).

Network Expenditures/Budget:
Total 1975-1982: $3,853,672
Total 1982-1986: $4,875,000
Total 1975-1986: $8,728,672

Funding Sources: USAID, National Science Foundation (NSF).

Common Network Plan/Strategy: Multi-site standardized experimentation.

Common Research Methodology: Yes

Planning Procedures: Workshop/participant involvement.

Network Publications: ***Biological Nitrogen Fixation Bulletin,*** published three times a year, is sent to over 1,600 readers in 100 countries. ***Methods in Legume-Rhizobium Technology,*** 1985, a training manual. WREN Newsletter published for benefit of collaborators. NifTAL's computer also has an electronic mail feature "OPEN" which acts as a bulletin board and allows collaborators to leave messages for each other.

Monitoring Tours: Visits by NifTAL scientists.

Workshops and Conferences: Yes

Network Training: Yes. As of 1985, nine 6-week training courses in Legume/Rhizobium technology had been held. Forty-five interns from 25 countries have received instruction and research guidance lasting from several weeks to 6 months from NifTAL scientists. In addition, NifTAL has partially or fully supported 25 graduate students working towards advanced degrees. NifTAL periodically cosponsors courses at various locations.

Two new courses started in 1984:

(a) ***BNF for LDC Extension Leaders*** (in conjunction with North Carolina State University and the Bangladesh Agricultural Research Council).
(b) ***Intensive Inoculant Production Course for LDC Researchers and Inoculant Producers.***

Indicators of Impact/Performance: NifTAL scientists have developed an inexpensive fermenter, appropriate for village level production, which will be made available for small production industries. NifTAL has assembled a ***Rhizobium*** germplasm collection, containing over 1,700 strains collected in 56 countries from 283 legume species, which will prove an invaluable resource when searching for strains that are stress-tolerant and superior nitrogen-fixers. This germplasm depository is part of the MIRCENs (Microbiological Resource Centers) network. NifTAL also maintains an antisera bank for some ***Rhizobium*** strains so that researchers can test whether introduced inoculum have become established in field trials. Antisera are distributed to scientists in over 40 countries. As of 1985, over 100 publications have resulted from NifTAL research, 41 of which were in refereed journals. NifTAL has aided in design and setup of medium- and large-scale inoculant production facilities in Burma, Egypt, Sri Lanka, Thailand, and Zambia.

Remarks:
NifTAL has cross-linkages with other networks, such as MIRCENs and IBSNAT.

References:
NifTAL: 10 years young. ***Biological Nitrogen Fixation Bulletin*** 6(1):1 (1985).

WREN--World-wide Rhizobial Ecology Network: A Newsletter for Collaborators. Number 1, 1987.

Planning an International Network of Legume Inoculation Trials: NifTAL Project. College of Tropical Agriculture and Human Resources, University of Hawaii/U.S. Agency for International Development, 1979, 241 p.

NifTAL: Resources for Development. College of Tropical Agriculture and Human Resources, University of Hawaii/U.S. Agency for International Development, no date (c. 1983), 28 p.

Final Report 1975-1986: NifTAL Report 1986. College of Tropical Agriculture and Human Resources, University of Hawaii/U.S. Agency for International Development, 1987, 66 p.

File date: 30 January 1989

Oilcrops Network for East Africa and South Asia

Contact Person and Address: Director, Agriculture, Food and Nutrition Sciences, International Development Research Centre (IDRC), P.O. Box 8500, Ottawa, Canada K1G 3HP. Phone (613) 236-6163. Telex: 053-3753.

Focus:

Phase 1 (1981-84)

Establish effective, practical liaison between the IDRC oilseeds projects in India, Pakistan, East Africa, Egypt, Sudan, Ethiopia, and Sri Lanka.

Phase 2 (1984-87)

Same objectives as phase 1, but the emphasis shifted from establishing the network to servicing and operating it.

Phase 3 (1987-89)

Strengthen the oilseed research carried out in Eastern and South Asia by establishing effective, practical liaison between national oilseed programs. Specific objectives are:

(a) to continue support so as to increase the effectiveness of national, oilcrops programs in the region,
(b) to establish the most effective mechanisms for exchanging oilcrop germplasm within the network,
(c) to provide middle-level technical training on oilseeds, and
(d) to evaluate new, more effective, forms of networks.

Year Started: 1981

Region: East Africa and South Asia.

Countries in Network: India, Pakistan, Egypt, Sudan, and Ethiopia.

Early Leadership: IDRC, Canada

Network Publications: Yes

Monitoring Tours: Yes

Workshops and Conferences: Yes

Network Training: Yes

References:

Omran, Abbas. 1988. Evolution of the oilcrops network for East Africa and South Asia. In: ***Eastern and Southern Africa Network Coordinators' Review, Held at Nairobi, Kenya, 9-12 May 1988,*** D.G. Faris and A.D.R. Ker (Editors), IDRC/CRDI/CIID, Ottawa, Canada.

File date: 1 February 1989

PANESA (Pasture Network for Eastern and Southern Africa)

Contact Person and Address: Dr. B.H. Dzowela, PANESA Coordinator, International Livestock Centre for Africa (ILCA), P.O. Box 46847, Nairobi, Kenya. Phone: 592013, 592093, 592122. Telex: 22040 ILRAD.

Focus: Foster research on pastures and forages. Research focuses on range, browse herbs and trees, and crop residues. Specific research mandates are:

(a) to further the evaluation of promising pasture, forage, and browse plant germplasm to be adapted and produced in different representative agroecological zones, and
(b) to develop appropriate pasture or forage production technologies that can be integrated into prevailing crop-livestock production systems.

Year Started: 1984, but coordinator of the network not appointed until 1986 (see remarks section).

Year Ended: 1988

Lead Institution: ILCA

Number of Individuals Involved: 1,300 on mailing list of newsletter.

Region: Eastern and Southern Africa.

Countries in Network: Angola, Botswana, Burundi, Ethiopia, Djibouti, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Somalia, Sudan, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.

Number of Network Sites: Fifteen collaborative research sites.

Legal Status/Formal Agreements: None. PANESA is not an institution, all depends on institutional and national pastures (forages) scientists' willingness to share research experience on common regional problems.

Governance Mechanism: PANESA is under ILCA's management and administrative umbrella. ***Steering Committee*** of elected members representing NARS, IDRC, ILCA, and ex-officio members (PANESA and ARNAB coordinators). The steering committee makes most of the decisions and advises the coordinator, both formally and informally, in planning and implementing PANESA activities and NARS involvement at the country membership level.

Network Coordinator is selected and appointed by the steering committee and is linked administratively to ILCA. Responsible for soliciting financial support.

Early Leadership: ILCA

Current Leadership/Coordination: Dr. B.H. Dzowela, ILCA, Nairobi, and elected Network Steering Committee members.

Organizational Structure: Coordinator assisted in network decisions and priority setting with Steering Committee. A bottom-up organizational structure.

Number of Network Staff (FTE): 1.5 composed of coordinator and secretary.

Network Expenditures/Budget: First two years--Canadian $400,000.

Funding Sources: IDRC, Ottawa.

Common Network Plan/Strategy: Yes, involving a collaborative research program identification and implementation strategy planning with Steering Committee, National Scientists, and ILCA's Animal Feed Resources Thrust Scientists.

Common Research Methodology: Yes, involving research designs, germplasm, data collection, data analysis and reporting; stratified on basis of agroecological zones--semi-arid, humid/subhumid/highlands.

Planning Procedures: Annual workshop with collaborating NARS and Steering Committee for regional program review/planning

Network Publications: ***The PANESA Newsletter*** (published by the International Livestock Centre for Africa, Addis Ababa). Proceedings of workshops.

Monitoring Tours: Biannual basis.

Workshops and Conferences: Three workshops thus far. Second workshop, entitled ***Legume Resources for Small Scale Farmers,*** and general meeting of PANESA held in Nairobi from 11-15 November, 1985, attended by 50 participants.

Network Training: Yes.
First PANESA training course ***Forage Plant Introduction and Initial Evaluation*** conducted 20-31 October 1986 at Soddo-Welayta and Zwai in Ethiopia. Sixteen trainees from ten countries participated. Second PANESA training course on ***Forage Evaluation Techniques*** held 12-23 January 1987, at Soddo-Welayta and Zwai in Ethiopia. Thirteen participants from nine countries came to the course.

Third PANESA training course on ***Pastures Seed Production Technology*** conducted 6-21 June, 1988, at Grasslands Research Station, Marondera, Zimbabwe. Twenty-three participants came from twelve countries.

Indicators of Impact/Performance: PANESA is considered valuable because: it has helped improve cooperation and trust between NARSs and ILCA. It has also encouraged technical/professional improvement in the critical mass involved in research and development of forages in Eastern and Southern Africa and promoted free exchange of forage plant germplasm among scientists in the region. NARSs see the network as a way for them to attract attention of the donor community to support research programs in feed resources that cannot be tackled by any one country. This network facilitates the exchange of information and ideas.

Remarks: Set up as a collaborative research network. The idea of forming PANESA was conceived by national scientists from 11 Eastern and Southern African countries and international and regional research organizations at a workshop on Pastures Research in Eastern and Southern Africa in Sept. 1984 at Harare, Zimbabwe.

References:

Dzowela, B.H. 1988. The Pastures Network for Eastern and Southern Africa. In: ***Eastern and Southern Africa Network Coordinators' Review: Proceedings of a Workshop held at Nairobi, Kenya, 9-12 May 1988,*** D.G. Faris and A.D.R. Ker (Editors), pp. 52-56, IDRC/CRDI/CIID, Ottawa.

The PANESA Newsletter. No. 3, December 1986.

File date: 1 February 1989

PIN (Pigeonpea International Nurseries)

Contact Person and Address: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), ICRISAT Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN. E-Mail: 157:CGI505.

Year Started: 1975

Lead Institution: ICRISAT

Countries in Network: 22

File date: 24 March 1988

PRACIPA (Programa Regional Andino Cooperativo de Investigacion en Papa)

Contact Person and Address: Dr. Fernando Ezeta, Centro Internacional de la Papa (CIP), Apartado 5969, Lima, Peru. Phone: 350266/350842. Telex: 394-25672 PE. E-Mail:157:CGI801.

Focus: Improving potato production and marketing. Two projects: one on agronomic research, the other on marketing. Research responsibilities are divided accordingly:

AGRONOMIC RESEARCH PROJECTS

Project	*Institution*
Simple methods for potato seed production for small-scale farmers.	IBTA, Bolivia
Control of Andean Weevil *(Premmotrypes vorax)*, known as "gusano blanco"	ICA, Colombia
A system for rapid multiplication of virus-free seed potatoes	INIAP, Ecuador
Integrated pest management in potatoes	INIAA, Peru
Integrated control of tuber moth	FONAIAP, Venezuela

MARKETING RESEARCH PROJECTS

Project	*Institution*
Marketing channels, middle-man and characteristics of seed potato demand	IBTA, Bolivia
Marketing of processed potato products	ICA, Colombia
Marketing of seed potatoes	INIAP, Ecuador
A system to improve decisions on production and marketing of potatoes	INIAA, Peru
The ware potato market	FONAIAP, Venezuela

Year Started: Memorandum of Agreement for PRACIPA signed 18 August 1982 in Lima for 5 years; agreement renewed on 18 May 1988 for an additional 5 years.

Year Ended: Present agreement expires 17 May 1993.

Lead Institution: None

Member Institutions/Individuals:

IBTA (Instituto Boliviano de Tecnologia Agropecuaria), Bolivia
ICA (Instituto Colombiano Agropecuario), Colombia
INIAP (Instituto Nacional de Investigaciones Agropecuarias), Peru
FONAIAP (Fondo Nacional de Investigaciones Agropecuarias), Venezuela
CIP, Lima, Peru.

Number of Individuals Involved: Approximately 30.

Region: Andes

Countries in Network: Venezuela, Colombia, Ecuador, Peru, and Bolivia.

Number of Network Sites: 5

Legal Status/Formal Agreements: Memorandum of agreement signed by five 5 NARSs and CIP.

Governance Mechanism: Coordinator visits each project twice a year, provides technical inputs, determines how well funds are spent and further financial needs, and ensures that data are sent to coordination office.

Early Leadership: CIP appointed coordinator.

Current Leadership/Coordination: Dr. Pedro Leon Gomez.

Organizational Structure:

Director's Committee of Research Leaders.

Technical Committee (composed of at least one national scientist responsible for each PRACIPA project and CIP).

Coordinator (executive secretary; up to 2 year rotating post. Individuals who have first served as assistant coordinator are preferred).

Assistant Coordinator (chosen from technical committee).

Number of Network Staff (FTE): None. NARS staff.

Network Expenditures/Budget: The agronomic research project is funded by Can $482,000 for 3 years; the marketing project is funded by Can $194,085 for 2 years.

Funding Sources: IDRC, Canada.

Network Publications: Yes; NOTIPRACIPA.

Workshops and Conferences: Yes

Network Training: Yes

Indicators of Impact/Performance:

-- Technology of rapid multiplication of pathogen-free seed potatoes has been efficiently transferred among the network countries. The Peruvian program has served as a model for planning the seed production projects of other network countries.

-- The links have been established within the network to undertake collaborative original research and technology transfer programs to control the Andean regional pests with emphasis on Andean weevil.

-- National scientists have become aware of regional limiting factors for potato research and development in the areas of agronomy and social sciences.

Remarks: Multipurpose commodity network set up as a collaborative research effort with 20% of funds allocated to training and meetings.

Difficulties/Concerns
Coordinator is hard-pressed to tend to coordinating function in PRACIPA and undertake his work responsibilities within national program. Perhaps, as PRACIPA grows, coordinator will be funded as a full-time position, as happened with PRECODEPA.

References:
D.G. Faris. 1987. ***Trip Report Washington and Meso America 3-27 November***. Memo.

Coordination Office. 1988. PRACIPA 1982-1988. Booklet.

File date: 2 February 1989

PRAPAC (Programme Regional d' Amelioration de la Culture de Pomme de Terre en Afrique Centrale)

Contact Person and Address: Dr. Fernando Ezeta, Centro Internacional de la Papa (CIP), Apartado 5969, Lima, Peru. Phone: 350266/350842. Telex: 394-25672 PE. E-Mail: 157:CGI801.

Focus: Develop and disseminate improved potato varieties and cultural practices adapted to Central Africa. Six major goals/outputs identified:

(a) identify and develop varieties resistant to bacterial wilt and late blight, and adapted to the climate and soils of member countries,
(b) develop viable potato production technologies suitable for peasants of member countries,
(c) develop and transfer to farmers locally tested storage principles for seed and table potatoes that are economically viable,
(d) develop survey techniques to measure new technology adoption rates, changes in potato consumption, and marketing patterns,
(e) provide in-service training for research technicians, extension agents, and farmers, and
(f) extrapolate findings from one country to another, disseminate information and technologies among PRAPAC countries.

Specific projects are as follows:

Country	*Projects*
Burundi	Storage of seed and ware potatoes
	Control of bacterial wilt
Rwanda	Control of late blight
	Local training of staff and technicians
Zaire	Adaptation of potato varieties to different agro-ecological zones
	Cultural practices in different agroecological zones
Uganda	Integrated Pest Management (IPM) in potato cropping systems
	Potato seed production technology
	Potato breeding and maintenance of a genebank at Kabanyolo

Year Started: 1982

Year Ended: Present agreement for 5 years expires 1990.

Lead Institution: None

Member Institutions/Individuals:

ISAR (Institut de Sciences Agronomiques du Rwanda), Rwanda
ISABU (Institut de Sciences Agronomiques du Burundi), Burundi
INERA (Institut Nacional pour l' Etude et la Recherche Agronomique), Zaire
Min. Agric., Uganda
CIP

Region: Great Lakes Region of Africa.

Countries in Network: Rwanda, Burundi, Zaire, and Uganda.

Legal Status/Formal Agreements: Memorandum of agreement signed by agricultural research institutions of participating countries and CIP.

Governance Mechanism: ***Directors Committee*** meets once a year. The ***Directors Committee*** is charged with:

(a) defining priorities and making all policy decisions,
(b) reviewing and approving work programs,
(c) approving budgets,
(d) suggesting any changes or additions to the work programs, and
(e) approving reports to be distributed to governments, donors, and CIP.

The responsibilities of the ***Executive Committee*** are:

(a) to prepare collaborative work plans,
(b) to propose changes and new projects for consideration by the Director's Committee,
(c) to propose budgets,
(d) to carry out decisions on the proper execution of the respective research projects, and
(e) to prepare annual reports for submission to the Directors' Committee.

Responsibilities of the ***Coordinator*** are:

(a) to organize all meetings of the Executive Committee,
(b) to arrange in-service training,
(c) to arrange consultancies, and
(d) to arrange for evaluations of PRAPAC projects.

Early Leadership: CIP

Current Leadership/Coordination: Jerome Kloos, c/o PNAP, Ruhengeri, Rwanda

Organizational Structure:

A ***Coordinator***, a CIP employee based in Rwanda, is appointed to work alongside national leaders as Liaison Officer to advise, communicate and inform on PRAPAC matters, organize meetings of the Executive Committee, organize training, identify and organize consultancies, evaluations, and reports.

A ***Directors Committee***, composed of national directors of agricultural research from the governments of Burundi, Rwanda, Zaire, and Uganda, plus the CIP regional representative for Tropical Africa who is based in Nairobi.

An ***Executive Committee*** made up of the National Potato Leaders of the PRAPAC countries and the Coordinator of PRAPAC. Meets at least twice a year.

Network Expenditures/Budget: First phase (5 years) US $1,557,000.

Funding Sources: USAID (for an initial 5-year period).

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Workshops and Conferences: Yes

Network Training: Yes

Indicators of Impact/Performance: In Burundi, the national program identified one clone with a very high degree of resistance to bacterial wilt, which is now used in approximately 70% of the potato growing area. The same clone has also been released in Rwanda and Zaire. Other varieties have been released that are common to the three countries. Uganda has recently joined the PRAPAC network and will benefit from the other country member technology departments.

Remarks: Multipurpose commodity network, set up to operate as a collaborative research effort. At this stage, PRAPAC is more like a scientific consultation network.
Rwanda dropped the True Potato Seed project.

Positive aspects:

-- Potato is high on list of priorities of the national agricultural research systems of participating countries.
-- Uganda has a relatively good group of well-trained scientists and technicians working on potato; likely to participate quite effectively now that civil strife in Uganda is under control.

-- Rwanda has well-trained scientists with dynamic leadership and reasonably good facilities.
-- An excellent training facility has been completed, with USAID funds, at Ruhengeri, Rwanda.

Some problems:

-- No jointly conducted projects, so contact between participants is minimal.
-- Annual reports are poorly prepared.
-- Some uncertainties regarding bilateral USAID mission support for local costs of PRAPAC countries. Hitherto, Zaire has received no USAID mission support for PRAPAC activities.

File date: 13 June 1989

PRECODEPA (Programa Regional Cooperativo de Papa)

Contact Person and Address: Dr. Fernando Ezeta, Centro Internacional de la Papa (CIP), Apartado 5969, Lima, Peru. Phone: 350266/350842. Telex: 394-25672 PE. E-Mail: 157:CGI801.

Focus: Improving potato production and storage. In 1988, research tasks were divided accordingly:

Project	*Leader*	*Co-leader*	*Participants*
Seed Production	Mexico	Cuba	Costa Rica, Guatemala, Panama, Nicaragua, Dominican Republic
Post-harvest technology	Guatemala	El Salvador	Honduras
Bacterial diseases	Costa Rica	Haiti	Guatemala, Mexico
Nematodes	Panama	Mexico	Costa Rica
Hot, humid tropics	Cuba	El Salvador	Dominican Republic
Tuber moth	Costa Rica	Guatemala	Dominican Republic, Mexico
Late blight	Mexico	None	Costa Rica, Cuba, Panama, Guatemala, Dominican Republic, El Salvador
Genetic management	Mexico	None	Costa Rica, Panama, Guatemala
Socioeconomics*	Guatemala	None	

* Suspended in 1988 due to insufficient staff in Guatemalan national program (ICTA--Instituto de Ciencia y Tecnologia Agricolas) trained in socioeconomics. The few Guatemalans trained in socioeconomics have largely left Guatemala to work at regional institutions such as CATIE and IICA in Costa Rica. The Swiss Development Cooperation hopes that socioeconomics can be restarted within PRECODEPA in the future. Genetic management (plant breeding) project started in 1986. In 1988, a technology transfer project has been added.

Year Started: 1978

Year Ended: Present agreement ends on 31 March 1989.

Lead Institution: None

Member Institutions/Individuals: Ten national programs plus CIP.

Number of Individuals Involved: Approximately 35.

Region: Central America and Caribbean.

Countries in Network: Mexico, Guatemala, Honduras, Costa Rica, Panama, Dominican Republic, El Salvador, Cuba, Haiti, and Nicaragua. El Salvador and Cuba joined in 1983. Haiti joined in 1985.

Number of Network Sites: Approximately 15.

Legal Status/Formal Agreements: Agreement between CIP and PRECODEPA. Memorandum of Agreement between SDC and CIP.

Governance Mechanism: The main body providing governance is the Regional Permanent Committee (COPERE). Coordinator is responsible for the administration of the regional program, compilation of research proposals, coordination of technical reviews, and managing the network's funds. In 1986, coordinator position was funded by the Swiss Development Cooperation as a full-time position in view of the growth of PRECODEPA. The executive committee (COE) responsible for seeing that COPERE decisions are implemented.

Specific functions of management entities within PRECODEPA are as follows:

Coordinator duties are to:

(a) coordinate annual meetings,
(b) act as liaison in the technical and administrative execution of regional projects,
(c) coordinate technical reviews,
(d) manage funds,
(e) maintain contact with the Swiss Development Cooperation, and
(f) carry out agreements reached by COPERE and COE committees.

COPERE (Policy committee) has responsibility to:

(a) nominate executive committee,
(b) draw up regional project for potato improvement,
(c) draw up priorities and appoint project leaders according to regional necessities and capabilities of national programs,
(d) seek external funds to support individual projects,
(e) help participating countries set up their budgets,

(f) contract an international auditing agency for overseeing the administration of external funding,
(g) establish procedures for selecting technical personnel for participating in PRECODEPA, and
(h) set up a technical committee to oversee projects.

COE (Executive committee) has responsibility to:

(a) implement COPERE's decisions,
(b) contract PRECODEPA personnel,
(c) promote PRECODEPA's collaboration and linkages with other networks and foster technology transfer,
(d) organize PRECODEPA meetings and other technical meetings, and
(e) represent PRECODEPA when dealing with countries and institutions.

Early Leadership: John Neiderhauser (then with the Rockefeller Foundation, Toluca, Mexico).

Current Leadership/Coordination: Roberto Rodriguez, Instituto de Investigacion Agropecuaria de Panama, Apdo. 6-4391, El Dorado, Panama. Term: 1987-89.

Organizational Structure:

Coordinator--elected for a 2-year term. Coordinator is guided by COPERE decisions. For the first 2 years, CIP coordinated PRECODEPA. Starting in 1980, however, the coordinator has been elected from one of the participating scientists from national programs within PRECODEPA. As of 1987, the post of coordinator has been funded externally as a full-time post.

The Regional Permanent Committee (COPERE) establishes policy and priorities. Composed of two representatives from each of ten member countries, and two representative from CIP.

The Executive Committee (COE--Comite Ejecutivo) is charged with ensuring that policy and priorities are carried out. Composed of three members: President, technical secretary, administrative secretary.

Number of Network Staff (FTE): One (full-time coordinator).

Network Expenditures/Budget: 5-year budget for 1978-83 was $1,902,870. As of 1988, budget is running about $240,000/yr.

Funding Sources: Half from Swiss Development Cooperation, other half of budget contributed by national programs.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes, function of the Regional Permanent Committee (COPERE).

Network Publications: Newsletter: ***PRECODEPA Informa.*** Issue no. 7 published August 1987.

Monitoring Tours: Field trips to network sites in the host country during or immediately after annual PRECODEPA meeting.

Workshops and Conferences: Annual meetings with two scientists from each of the countries participating in PRECODEPA. At the annual meetings, COE and COPERE also hold meetings. The 1988 annual meeting was in Antigua, Guatemala, and the 1989 meeting will be in El Salvador. Starting in February 1989, CIP will invite all potato program leaders participating in PRECODEPA to CIP's headquarters for 1 week to witness the various scientific programs and to examine the latest research techniques.

Network Training: As of 1985, 110 technicians had participated in 14 seminars, workshops, or production courses organized by PRECODEPA. Example: ***Curso Internacional Sobre Produccion de Papa en Climas Calidos,*** El Salvador. Training is an important part of PRECODEPA activities.

Indicators of Impact/Performance: Tollocan, a potato variety developed by the Mexican national program resists late blight and is being adopted by network member countries. Six PRECODEPA member countries now have seed improvement schemes as a direct result of training in Mexico. Diffuse light storage for seed potatoes is being increasingly used at the farm level in Guatemala and Costa Rica, and to a lesser degree in Panama. Mexico has distributed 22 potato clones resistant to late blight to PRECODEPA participants with promising results in field trials.

Remarks:

-- A multipurpose commodity network that functions as a collaborative research effort.
-- PRECODEPA was a grass-roots affair from the beginning; national programs in the region wanted to reach out to each other for help. National programs in potato in Central America and the Caribbean are particularly eager to collaborate since they are generally small and have limited resources; program leaders wisely perceived the benefits of pooling resources and avoiding unnecessary redundancy. CIP was not the instigator of this network, but now funnels

Swiss Development Cooperation funds to network participants, provides some counseling, and accounting.

-- A major reason that PRECODEPA took off was that national potato programs in the region were small enough to really need each other for help. Here, then, self-interest has been a powerful motivating force.

-- Another important factor in the progress of PRECODEPA has been the sustained support of the donor: the Swiss Development Cooperation. COSUDE, as the donor is known in L. America, sees itself not so much as the short-term catalyst, but as the lubricant to keep the process going. This continued interest and support by COSUDE has been facilitated by Paul Egger, the donor representative since the inception of PRECODEPA.

-- PRECODEPA is self-governing. It does not depend on decisions/cues from any international center or donor. Swiss Development Cooperation and CIP provide non-intrusive suggestions when appropriate and these are well received. But the major donor and CIP essentially take a hands-off approach now that the network is relatively mature and participants govern themselves with quality control paramount in their thinking.

-- PRECODEPA is now very much concerned with transfer technology and interfacing with extension services to get technologies into the hands of farmers. While there is clearly still further need for research, there is also the feeling that a number of technologies are far enough along now to check their acceptance with farmers.

-- PRECODEPA is seeking ways to forge linkages with other agricultural research networks. For example, PRECODEPA is collaborating with PRACIPA (a regional potato research network for the Andes) on tuber moth and late blight research.

Difficulties/Concerns

-- Occasionally, the leader of a project falters somewhat. When this happens, another leader is found, or the project is dropped. Such adjustments do not appear to generate any significant ill feelings, however. Indeed, once capabilities are improved, the original leader may resume the leadership role; this situation apparently occurred with the bacterial diseases project which Costa Rica originally had some problems leading and thus temporarily stepped down as leader. Now Costa Rica is once again leading the bacterial diseases project after its capabilities improved in this research area.

-- High turnover of national potato program staff in Honduras (due in part to changes in government) has apparently hampered the contribution of Honduras in some PRECODEPA projects.

-- Communication between PRECODEPA coordinator and participating countries is sometimes a problem. Participants would undoubtedly benefit from being linked by an electronic mail system using computers.
-- Reporting of funds has posed some recent problems. Some discrepancies have been noted in different auditing reports regarding funds allocated and spent by various PRECODEPA projects. These difficulties appear to be related to differences in accounting procedures and a failure in some cases to inform donors/coordinator on transactions. Auditing and reporting procedures are relatively complex. Three auditors are involved in reviewing the expenditure of PRECODEPA funds. Price-Waterhouse is supposed to receive statements from PRECODEPA countries and CIP. Price-Waterhouse distributes its findings to CIP and Swiss Development Cooperation. CIP has its own separate auditor, and so does the Swiss Development Cooperation. Standardized reporting procedures and prompt and regular reporting of how funds are managed to Price-Waterhouse would undoubtedly clear up discrepancies.
-- Imminent turnover of staff in national programs involved in PRECODEPA's tuber moth project is causing concern. More training to replace scientists who leave for graduate degree programs or administrative posts is called for.

References:

Valverde, C. and K. Brown. 1985. ***Regional Research Networks: The Experience of PRECODEPA.*** ISNAR (International Service for National Agricultural Research), The Hague, Netherlands, Country Report No. R23, 16 p.

CIP. 1985. ***El Programa Regional Cooperativo de Papa: Informe de la Mision de Revision, Junio de 1984.*** Centro Internacional de la Papa, Lima, Peru, 71 p.

Rodriguez, Roberto. 1987. ***PRECODEPA 1987.*** Panama, 14 p.

Rodriguez, Roberto. 1988. ***Programa de Capacitacion y Plan de Colaboracion: CIP-PRECODEPA 1988.*** Coordinacion PRECODEPA, Panama.

Informe de la Coordinacion: Marzo de 1988.

Ruano, Sergio, Rolando Estrada, and Leonzo Godinez. 1987. ***Limitantes del Uso de Semilla Mejorada de Papa en Guatemala: Una Vision Integral.*** Instituto de Ciencia y Tecnologia Agricolas (ICTA)/Proyecto Regional Cooperativo de Papa (PRECODEPA), Guatemala, 153 p.

Velasquez, Marcelo R. and Oscar L. Orozco. 1983. ***Almacenamiento de Papa Destinada a Semilla.*** Instituto de Ciencia y Tecnologia Agricolas (ICTA), Guatemala, Folheto Tecnico 26, 51 p.

Valencia, Luis, Jose E. Mancia, Ramiro Rocha, and Roberto Rodriguez. 1988. Programa Regional Cooperativo de Papa: ***Informe de la Revision Tecnica del Proyecto de Polilla de Papa***. Antigua, Guatemala.

PRECODEPA. 1987. ***Produccion de Tuberculo-Semilla Comercial de Papa: Seminario Taller Realizado en el Centro Internacional de la Papa (CIP), Lima, Marzo 3-11, 1986***. Centro Internacional de la Papa (CIP), Lima, 89 p.

Bryan, James E. and Roberto Rodriguez. 1987. ***Programa Regional Cooperativo de Papa (PRECODEPA): Informe de la Revision Tecnica del Proyecto de Produccion de Semilla***. Toluca, Mexico.

File date: 2 February 1989

PROCIPA (Programa Cooperativo de Investigaciones en Papa)

Contact Person and Address: Dr. Fernando Ezeta, Centro Internacional de la Papa (CIP), Apartado 5969, Lima, Peru. Phone: 350266/350842. Telex: 394-25672 PE. E-Mail: 157:CGI801.

Focus: Improve potato production and productivity by means of research and technology transfer.

Year Started: 1982

Lead Institution: International Potato Center (CIP--Centro Internacional de la Papa).

Member Institutions/Individuals: Member Institutions--
INTA, Argentina
EMBRAPA, Brazil
INIA, Chile
CIAAB, Uruguay
CIP

Region: Southern and eastern South America.

Countries in Network: Brazil, Uruguay, Argentina, and Chile.

Legal Status/Formal Agreements: Memorandum of Agreement.

Governance Mechanism: Coordinator, Executive Committee.

Early Leadership: CIP's regional representative.

Current Leadership/Coordination: CIP

Organizational Structure: Coordinator, Executive Committee, and Technical Committee.

Funding Sources: International Potato Center (CIP--Centro Internacional de la Papa). Special funding is being sought.

Planning Procedures: Technical committee submits proposal to executive committee.

Workshops and Conferences: Yes

Network Training: Yes

Indicators of Impact/Performance: Remarkable development of their seed programs fostered by the shortage of financial resources to continue previous seed import policies, a situation common to most developing nations.

Remarks: Multipurpose commodity network set up as a collaborative research effort.

File date: 2 February 1989

Public Awareness Association

Contact Person and Address: Dr. Richard L. Sawyer, Director General, Centro Internacional de la Papa (CIP), P.O. Box 5969, Lima, Peru. Phone: 350266. Telex: 25672 PE.

Focus: Increase public understanding of the goals and achievements of the international agricultural research system, and particularly of the IARCs. Objective is to increase support for international agricultural research through a better understanding and sensitivity to the complex issues faced by countries as they strive to raise and sustain agricultural productivity. The IARC Public Awareness Association builds upon the idea that a loosely coordinated approach to promoting research can be a cost-effective and powerful tool. Its mission will be to enhance public affairs capacities of its members, integrate them wherever possible, and, in the process, encourage the development of an international public awareness program. Three major projects envisaged for 1988-89 are:

(a) supporting a pilot seminar series for science journalists conducted along the lines of programs run by the Council for the Advancement of Science Writing and the American Cancer Society,
(b) sponsoring a series of National Geographic articles in 1989 and in 1990-91 (the first article will be on plant genetic resources, the second on the world food situation),
(c) conducting a pilot public awareness program in L. America on plant genetic resources. Four IARCs are involved: CIMMYT, CIAT, CIP, and IBPGR. The Italian government may commit $1 million to this effort.

In addition, several technical support projects are being planned. These include three databases that will improve the system's access to the international media, a monitoring and evaluation mechanism that will help gauge progress of the Association.

Year Started: 1988

Countries in Network: 10

Legal Status/Formal Agreements: Informal

Governance Mechanism:
Public Awareness Council serves as the steering/advisory body. Members of the Council include five donor agencies (IDRC, Italy, France, Rockefeller Foundation, U.S.) and three IARCs (CIAT, CIP, and CIMMYT). Its functions are to regularly review the strategies, plans, and activities of the Association; develop

support for the Association; and provide linkages with the CGIAR community at large.

Early Leadership: Dr. Richard Sawyer, CIP.

Funding Sources: CGIAR Secretariat has provided $60,000 as start up funds. Italy has provided $640,000 for a European Information initiative.

Workshops and Conferences: First workshop of the Association held at CIMMYT, Mexico, 22-24 June 1988. Four major issues identified of widespread concern and interest:

Genetic Resources
Sustainability
Biotechnology
Women in Agriculture

Second Meeting of the Public Awareness Council was held 29 October 1988 in Washington, D.C.

Network Training: No

Remarks: A sophisticated information exchange network, much more than just a mailing list--this network holds regular meetings, has an advisory body, and is highly successful at fundraising. Has many attributes of a scientific cooperation or collaborative research network, except that the network is not set up to do research, rather raise awareness of pertinent issues. The Association is informal and entirely voluntary. Membership is open to a wide variety of research and development organizations.

File date: 2 February 1989

RIEPT (Rede Internacional de Evaluacion de Pastos Tropicales)

Contact Person and Address: Pastures Program, Centro Internacional de Agriculture Tropical (CIAT), Apartado Aereo 6713, Cali, Colombia. Phone: (57-23) 689343.

Focus: Tropical pasture research. Specific objectives are to:

(a) study the adaptability of germplasm of grasses and forage legumes in lowland tropical ecosystems,
(b) increase the availability of germplasm of forage plants, and

(c) promote the technological development of pasture production in pioneer cattle fronts in the American tropics.

Lead Institution: CIAT

Region: Central and South America, Caribbean.

Organizational Structure: Various types of regional trials conducted by NARSs. CIAT is the nerve center where data are collated and analyzed.

Remarks: This is a collaborative research network, drawing extensively on genetic resources maintained at CIAT. EMBRAPA (the Centro de Cerrado, near Brasilia) is enthusiastic about this network.

References:
Toledo, Jose M. Objetivos y organizacion de la Red Internacional de Evaluacion de Pastos Tropicales. ***Manual para Evaluation Agronomica***. Ed. Jose M. Toledo.

File date: 2 February 1989

RISPAL (Rede de Investigaccion en Sistemas de Produccion Animal en Latinoamerica--Latin American Research Network for Animal Production Systems).

Contact Person and Address: Manuel E. Ruiz, Secretario Ejecutivo, RISPAL, IICA, Apartado Postal 55, 2200 Coronado, San Jose, Costa Rica.

Focus: Advancement of FSR methodology as applied to animal production in L. America, particularly within the context of resource-limited farmers.

Year Started: 1981, but not formally created until 1986.

Lead Institution: IICA (Inter-American Institute for Cooperation in Agriculture).

Member Institutions/Individuals:

IICA, Costa Rica
CATIE, Costa Rica
INIAA, Peru
IDRC, Canada
Winrock International, U.S.
INIFAP, Mexico
CARDI
ICTA, Guatemala
DIGESEPE, Guatemala
University of San Carlos, Guatemala
Livestock Development Center, El Salvador
IDIAP, Panama
GENIP, Dominican Republic
ICA, Colombia
IVITA, Peru
CEDAP, Peru
FONAIAP, Venezuela
Catholic University, Chile

Number of Individuals Involved: Approximately 200.

Region: Latin America

Countries in Network: Canada, U.S., Mexico, Guatemala, El Salvador, Costa Rica, Panama, Dominican Republic, Guyana, Venezuela, Colombia, Peru, and Chile.

Number of Network Sites: 24

Legal Status/Formal Agreements: Grant Memoranda between IDRC and each of the following institutions: IICA, CATIE, and INIAA, signed in April 1986.

Governance Mechanism: General Coordinating Office, based in San Jos, Costa Rica, responsible for the coordination, programing and execution of coherent plans in the three agreements mentioned above.

Early Leadership: Manuel E. Ruiz.

Current Leadership/Coordination: Manuel E. Ruiz.

Organizational Structure: Directorate, Coordinator, General Assembly.

Number of Network Staff (FTE): 3

Network Expenditures/Budget: US $236,570/yr.

Funding Sources: IDRC, IICA, CATIE, and INIAA.

Common Network Plan/Strategy: Application of systems approach methodology to research, farmer participation, interdisciplinary work, on-farm experimentation.

Common Research Methodology: Site selection, rapid rural appraisals, farm diagnosis, prioritization of problems and research areas, farm and experiment station research, modelling and ex-ante analyses, design of alternatives, on-farm evaluation of alternatives, technology transfer.

Planning Procedures: Operational programing according to specific procedures at each technical institution (IICA, CATIE, and INIAA), review and guidelines set by RISPAL's Directorate, recommendations and agreements by RISPAL's Plenary sessions.

Network Publications: *Carta de RISPAL* (quarterly bulletin), proceedings of general meetings, methodological guidelines, and workshop proceedings.

Monitoring Tours: Average 7/yr.

Workshops and Conferences: Yes

Network Training: Yes

Indicators of Impact/Performance: Institutional adoption of research methodology with a systems approach, advancement of research methodologies, adoption of improved technology by farmers.

Remarks: Judging by newsletter no. 5 *(Carta de RISPAL)* there is very open discussion of problems and issues, including criticisms of the network. Criticisms levelled at the network include:

(a) some confusion over methodology,
(b) uncertain criteria for selection of study sites, and
(c) target group(s) for research results unclear.

File date: 2 February 1989

RNAM (Regional Network for Agricultural Machinery)

Contact Person and Address: Dr. Zhia U. Rahman, Project Manager, Regional Network for Agricultural Machinery, Economic and Social Commission for Asia and the Pacific of the United Nations, c/o United Nations Development Programme, P.O. Box 7285, ADC Pasay City, Metro Manila, Philippines. Cable: UNDEVPRO. Telex: RCA 72222250, Eastern 63557-63696 Globe Mackay, ITT 45226. Telephone: 3522/3470 Los Baos.

Focus: Promotion of technical cooperation among LDCs in the area of agricultural mechanization through exchange of information on selection, design and development, adaptation, testing, local manufacture, and popularization of agricultural machinery. Agricultural machinery of various kinds for small- to large-scale farmers.

Year Started: 1977

Member Institutions/Individuals: There are ten national institutes involved in RNAM.

Number of Individuals Involved: Approximately 500. This figure includes the staff of the ten national institutes involved.

Region: South and Southeast Asia.

Entities in Network: India, Indonesia, Iran, Pakistan, Philippines, Republic of Korea, Sri Lanka, and Thailand. Nepal and Bangladesh to join in January 1987.

Number of Network Sites: Each of the ten institutes.

Legal Status/Formal Agreements: A project document serves as the instrument of the Basic Assistance Agreement between the United Nations Development Program and the governments of those participating countries which have signed such Agreement for the plant of project operation and implementation.

Governance Mechanism: A ***Governing Body*** (GB) composed of senior level representatives of the participating countries and the cooperative countries (Australia, Japan, Netherlands), ESCAP, FAO, UNDP, UNIDO, and IRRI plus the RNAM project manager, meets once a year. The GB decides on matters relating to financial contributions, external assistance, inter-country cooperation and complementary/reciprocal arrangements in the implementation of project activities.

A ***Technical Advisory Committee*** (TAC) composed of technical representatives from the participating countries, the cooperating countries (Australia, Japan, Netherlands), ESCAP, FAO, UNDP,

UNIDO, IRRI, and the RNAM Regional Office, formulates the work program, evaluates progress, and advises on all technical matters concerning the project. TAC meets once a year.

Early Leadership: RNAM has its origin in the former Asian Industrial Development Council (AIDC) which studied the agricultural machinery industry from 1968-1972 and identified the need for a regional institutional arrangement.

Current Leadership/Coordination: ESCAP

Number of Network Staff (FTE): The Regional Office has two international staff and ten local staff.

Network Expenditures/Budget: $800,000 annually (1986). About 25% of the budget is for cost of secretariat in Los Banos, Philippines, and 37% is for training. Budget 1987-1991 is US$3,032,230. About 33% of this budget is for institutional support (RNAM office); 24% for experts and consultants; 25% for training; and 18% for catalytic financial assistance (equipment, publications, and exchanges).

Funding Sources: Funding provided by UNDP (50%), governments of Australia and Japan (20%), remainder from participating countries.

Common Network Plan/Strategy: RNAM is based on the network concept for attaining close collaboration and extensive exchange of information on various aspects of agricultural mechanization among participating countries under the coordination of the Regional Office.

Common Research Methodology: A common research methodology has evolved. However, each participating country employs various research methodologies as deemed suitable for their respective conditions.

Planning Procedures: Each National Institute (NI) plans its own work program specific for their country. However, the NIs conduct common activities among the participating countries as agreed during TAC meetings.

Network Publications: Brochures, newsletters, annual reports, and technical bulletins.

Monitoring Tours: Yes

Workshops and Conferences: Yes

Network Training: Annual training courses runs for 10-12 weeks. Each course focuses on a different theme. Courses are held in participating countries. Fellowships provided.

Indicators of Impact/Performance: 10,000 cereal harvesters based on RNAM research and development have been sold in India and Pakistan for about $10,000 each.

Remarks: Of the RNAM participants, Republic of Korea reputed to have best extension service and is the most progressive and advanced in various aspects of agricultural mechanization.

References:

RNAM Newsletters

ESCAP. 1985. ***Regional Network for Agricultural Machinery: India, Indonesia, Islamic Rep. of Iran, Pakistan, Philippines, Rep. of Korea, Sri Lanka, Thailand.*** Economic and Social Commission for Asia and the Pacific, United Nations.

File date: 2 February 1989

Sago Advancement Group Office (formerly the Sago Palm Research Network)

Contact Person and Address: Mr. A. Power, Office of Economic Services, East Sepik Provincial Government, C/-Bureau of Management Services, Free Mail Bag, Wewak, Papua New Guinea. Telegram: BUREAU NE 86111. Phone: 86 2200 x291

Focus: Principle aim is to serve as a mechanism for dissemination of information between groups interested in establishing sago palm as one of the major crops of the future. Sago palm is a significant source of starch for rural peoples in various parts of S.E. Asia. Ultimate goal is to set up a Sago Research and Development Institute (Government of Papua New Guinea approached Japan in 1986 for funding--the Sago Palm Research Fund is located in Japan, but the request was turned down).

Year Started: 1985

Member Institutions/Individuals: First newsletter sent to 80 individuals worldwide. Fourth Newsletter sent to 100 institutions/individuals in June 1987.

Number of Individuals Involved: 20

Region: Souteast Asia and Pacific.

Countries in Network: U.K., U.S., Netherlands, Japan, Malaysia, Indonesia, Papua New Guinea, France, Italy, West Germany, Singapore, Thailand, and Australia.

Number of Network Sites: Approximately 5.

Legal Status/Formal Agreements: Informal resolution of Third International Sago Symposium, Tokyo, 1985.

Governance Mechanism: Meet at symposia only.

Funding Sources: East Sepik Provincial Government.

Network Publications: ***Sago Palm Research Network Newsletter,*** No. 1 published June 1985. No. 4 published June 1987.

Monitoring Tours: Ad hoc, self-sponsored.

Indicators of Impact/Performance: Increasing number of scientists working on sago especially in Japan.

Remarks: Essentially a mailing list operation at this time. Idea expressed by Anthony P. Power (letter in file on network) that networking unlikely to work well in relatively poorly studied crop because national programs in LDCs have very limited funds---sago palm needs a regional institute, rather than a network (such an institute could evolve to cover other palms, such as nipa, as well).

File date: 2 February 1989

SAPPRAD (Southeast Asian Program for Potato Research and Development)

Contact Person and Address: Dr. Fernando Ezeta, Centro Internacional de la Papa (CIP), Apartado 5969, Lima, Peru. Phone: 350266/350842. Telex: 394-25672 PE. E-Mail: 157:CGI801.

Focus: Tropical agronomy (Indonesia), simple seed production (Papua New Guinea), germplasm development (Philippines), true potato seed (Sri Lanka), post-harvest technology (Thailand). In 1984, a further project was added, Technology Transfer, under the auspices of the coordinator's office.

Year Started: 1980

Lead Institution: None

Member Institutions/Individuals:

Philippine Council for Agriculture and Resources Research, Philippines
Agency for Agricultural Research and Development, Indonesia
Department of Agriculture, Sri Lanka
Department of Agriculture, Thailand
Department of Primary Industry, Papua New Guinea
CIP

Region: South and Southeast Asia.

Countries in Network: Philippines, Indonesia, Thailand, Papua New Guinea, and Sri Lanka.

Legal Status/Formal Agreements: Memorandum of Agreement.

Governance Mechanism: Coordinating committee serves as the policy-making body.

Early Leadership: Lindsay J. Harmsworth, CIP-appointed Coordinator.

Current Leadership/Coordination: Dr. Ponciano Batucal.

Organizational Structure:

Coordinating Committee: One representative from each of the five member countries, plus one representative each from CIP and ADAB (Australian Development Assistance Bureau). Chairmanship rotates annually.

Technical Committee: Assists the coordinating committee. The technical committee consists of the SAPPRAD coordinator and one project leader from each member country. The two committees' annual meetings are usually held jointly.

Coordinator: CIP appoints the coordinator in consultation with coordinating committee.

Network Expenditures/Budget: $2,301,000 (1982-1986).

Funding Sources: From 1982-1986, Australian Development Assistance Bureau (ADAB) provided 54% ($1,250,900) of SAPPRAD's budget, participating national programs provided 41% ($940,000), while CIP contributed 5% ($110,100). CIP provides in-kind contributions of germplasm, training, and technical assistance. CIP funded half the salary of the coordinator in 1982 and full salary plus expenses for coordinator starting in 1986.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Planning Procedures: Yes, function of the technical committee.

Monitoring Tours: Yes

Workshops and Conferences: Yes, e.g. Second Asian Potato Conference was held in Jakarta in 1986. SAPPRAD has annual meetings. Annual meetings take place in country of the chairman of the Coordinating Committee.

Network Training: Yes, e.g. 6-day Regional Seed Production Course held at Baguio, Philippines, in 1986. Also two courses in Indonesia in 1986--one at Jambege in E. Java, the other at Lembang, W. Java. The courses in Indonesia focused on extension and were conducted in English and Bahara Indonesian.

Indicators of Impact/Performance: Although increases in the number of potato scientists in SAPPRAD countries cannot necessarily be attributed to the network, it is clear that national programs are putting increased resources into potato research and this is partly due to progress in collaborative research within SAPPRAD. Increases in staffing in potato R&D in SAPPRAD countries since 1980 range from 55 to more than 400%.

-- Since 1984, more than 200 Thai farmers have adopted diffuse-light storage of potato.
-- Indonesia has benefited from SAPPRAD by tapping into CIP's and SAPPRAD's research on lowland potato production, particularly in the Philippines.

-- Sri Lanka has benefited from the stimulus and orientation of SAPPRAD in its true potato seed work. SAPPRAD funds, although modest, have helped fill strategic gaps in Sri Lanka's potato R&D program.
-- Germplasm distribution from the Philippines has been helpful to Indonesia, Thailand, and Sir Lanka.

Remarks: Multipurpose commodity network set up as a collaborative research effort. Sweet potato may be added to SAPPRAD in the future.

Difficulties/Concerns

-- Rapid staff turnover of scientists working on potato in Papua New Guinea has complicated collaboration with other SAPPRAD countries, particularly Thailand.
-- The Philippines apparently sent some diseased potato germplasm to Sri Lanka, although no formal report on this incident has emerged. The germplasm shipments were not in tissue culture form.
-- Philippine project receiving poor feedback on the performance of genetic materials it sends to SAPPRAD countries.

References:

Page, O.T. and D.E. Horton. 1987. ***SAPPRAD, Southeast Asian Program for Potato Research and Development: 5-Year Review 1982-1986.*** International Potato Center (CIP), Lima, 161 p.

File date: 25 April 1988

SDI-ICRISAT (Selective Dissemination of Information--International Crops Research Institute for the Semi-Arid Tropics)

Contact Person and Address: L.J. Haravu, Library and Documentation Services, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), ICRISAT Patancheru P.O., Andhra Pradesh 502 324, India. Phone: 224016. Telex: 422203 ICRI IN.

Focus: Provides literature search information on specific topics related to ICRISAT's mandated crops and programs to scientists requesting this information.

Year Started: 1988

Lead Institution: ICRISAT

Member Institutions/Individuals: SDI service reaches 254 scientists.

Region: Semi-arid tropics.

Countries in Network: 37

Early Leadership: ICRISAT

Remarks: An information exchange/mailing list network. SDI is a service of SACTRIS (Semi-Arid Tropical Crops Information Service) and draws its information from two global databases--CABI, and FAO's AGRIS.

References:

ICRISAT Annual Report 1986. ICRISAT, Patancheru, p. 361.

File date: 20 June 1989

SDI-ILCA (Selective Dissemination of Information--International Livestock Center for Africa)

Contact Person and Address: Library and Documentation Services, International Livestock Center for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia. Phone: 613215. Telex: 980-21207 ILCA ET.

Focus: Literature searches on livestock matters for scientists in Africa; literature searches are tailored to individual research interests.

Year Started: 1983

Lead Institution: ILCA

Member Institutions/Individuals: 750 people reached by this SDI service in 1988.

Number of Individuals Involved: 750

Region: Sub-Saharan Africa.

Countries in Network: 32

Current Leadership/Coordination: ILCA

Number of Network Staff (FTE): 2

Network Expenditures/Budget: US $39,000

Funding Sources: IDRC, ILCA.

Indicators of Impact/Performance: As in the case of SDI-ICRISAT, demand for the service is growing. In 1983, SDI-ILCA reached 250 people; by 1988, the number of participants had grown to 750.

Remarks: SDI-ILCA produces a monthly computer printout for people on the list for the service.
Database for literature searches is:

(a) Commonwealth Agricultural Bureaux International (CABI)
(b) FAO's AGRIS (International Information Service on the Agricultural Sciences and Technology).

Plans call for a near doubling of people reached by this service to 1,000 individuals.

References:

ILCA Annual Report 1986/1987 A Year of Progress and Change. International Livestock Centre for Africa, Addis Ababa, p.64.

SDI Service. Documentation Centre, International Livestock Centre for Africa, Addis Ababa, 1983.

Hardin, L.S., J. Morris, P. Rashid, and S. Ozgediz. 1986. ***Report of the First External Management Review of the International Livestock Centre for Africa (ILCA)***. CGIAR, World Bank, Washington, D.C.

File date: 2 February 1989

Small Ruminant and Camel Group Research Network

Contact Person and Address: Dr. R.T. Wilson, Head/Principal Animal Scientist, Small Ruminant and Camel Group, International Livestock Centre for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia. Phone: 183215-25. Telex: 976-21207 ILCA ET.

Focus: Objectives of proposed network are:

(a) to carry out fundamental and applied research,
(b) to coordinate ILCA's other research on small ruminants and to assist and advise on analysis and publication,
(c) to collect production data already analyzed elsewhere and suggest solutions to production constraints in the light of available results,
(d) to collect and analyze unpublished data on reproduction, growth and disease in the various ecological zones of Sub-Saharan Africa and relate these to prevailing nutritional and management conditions,
(e) to assess and to diagnose specific causes of mortality, particularly at the preweaning stage,
(f) to develop a manual of survey techniques (including sampling procedures, sample sizes, and diagnostic methods) for use in small ruminant productivity in Africa,
(g) to study the social and management factors that contribute to productivity differences,
(h) to encourage research on the potential for improving productivity by selective breeding within and among indigenous breeds,
(i) to help organize regional or national training requirements, and
(j) to publish a newsletter to disseminate results or development experience and to maintain contact between researchers and development officials.

Year Started: Proposed 1986 at meeting in Montpellier, France (see Wilson, 1986, in References section).

Lead Institution: ILCA

Countries in Network: Mali, Kenya, Nigeria, Ethiopia, Sudan, Burkina Faso, Mocambique, Rwanda, and Zimbabwe.

Early Leadership: ILCA

Funding Sources: ILCA core, GTZ, and ODA.

Network Publications: Newsletter three times a year.

Remarks: Informal cooperation already exists between ILCA scientists and national programs in the area of small ruminant

research; network is proposed to further collaborative work by better coordinating activities. If implemented, such a network would probably be classified as a scientific consultation network with a distinct possibility of becoming a collaborative research network. It is not clear whether there would be any linkages with the CRSP-Small Ruminant network. Also, to what extent would the research thrust on the potential of indigenous breeds interact with the Trypanotolerant Livestock Network?

References:

Wilson, R.T. 1986. The small ruminant and camel group and research network of the International Livestock Centre for Africa. Paper prepared for presentation at the workshop ***Coordination of Small Ruminant Research for Development in Africa,*** 13-17 October 1986, Montpellier, France.

File date: 10 January 1988

Sorghum Breeding Networks

ISVAT (International Sorghum Variety Adaptation Trial)
ISHAT (International Sorghum Hybrid Adaptation Trial)
ARSVAT (Asian Regional Sorghum Variety Adaptation Trial)
ARSHAT (Asian Regional Sorghum Hybrid Adaptation Trial)
ISVHAT (International Sorghum Variety and Hybrid Adaptation Trial)
ISTN (International Sorghum Trials and Nurseries)

Contact Person and Address: Principal Sorghum Breeder, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), ICRISAT Patancheru P.O., Andhra Pradesh 502 324, India, Phone: 224016. Telex: 422203 ICRI IN. E-Mail: 157:CGI505.

Focus: To assess the adaptation of material (varieties and hybrids) and distribution of useful material to NARSs.

Year Started: 1982

Lead Institution: ICRISAT

Number of Individuals Involved: In 1987, 66 cooperators involved as follows-- ISVAT (34); ISHAT (25); and ISTN (7).

Region: Semi-Arid Tropics of the World: ISVAT, ISHAT, ISVHAT. Asia: ARSVAT and ARSHAT.

Countries in Network: 40

Number of Network Sites: 78

Legal Status/Formal Agreements: Memorandum of Understanding with India, China, W. Africa, E. Africa, southern Africa, and remainder on basis of agreement with NARS scientists.

Governance Mechanism: Management of trials with the national programs, seed dispatch, summarizing of data and report writing with ICRISAT.

Early Leadership: ICRISAT

Current Leadership/Coordination: ICRISAT

Organizational Structure: No formal structure until 1988. In 1988, Cereals Cooperative Research Network Unit was formulated to look after this work.

Number of Network Staff (FTE):

1982-1988
0.5 Principal Sorghum Breeder (1)
0.2 Sorghum Breeders (5)
0.5 Research Associates (1)
0.5 Field Assistant (1)

1988-continuous
1.0 Principal Coordinator (1)
1.0 Cereal Scientist (1)

Common Network Plan/Strategy: To evaluate sorghum material across locations and select for adaptability and adaptation through multilocation testing.

Common Research Methodology: Adaptability through multilocation testing.

Planning Procedures: The entries selected based on evaluation in different centers at ICRISAT's disposal are included in this network. Scientists/locations on requests and/or considered appropriate are included in test sites.

Network Publications: No separate network publications. Results reported in ICRISAT's Annual Reports.

Monitoring Tours: 5% of the trials are visited by the ICRISAT principal sorghum breeder every year.

Indicators of Impact/Performance:
About 40% of the data sets are returned from trials.
About 5% of the materials are being selected for use by NARSs.

Remarks: Before the network, sorghum breeders were sending seed materials individually, based on requests. Now with this network system, interchange is more systematic. In 1982, trials (sorghum hybrids and varieties) were organized into networks. In 1988, a new unit, Cereals Cooperative Research Network, was established with a Coordinator and a National Scientist.

File date: 2 February 1989

South East Asia/Pacific Forage Research and Development Program

Contact Person and Address: Mr. T.R. Evans, CSIRO Division of Tropical Crops and Pastures, 306 Carmody Road, St. Lucia, Queensland 4067, Australia.

Focus: Catalyze research in pasture and forage production and utilization, support research planning and execution, and to assist in publication of results of studies of plant nutrition in forage crops in smallholder systems, extensive native pastures, and inter-crop systems.

Lead Institution: CSIRO Division of Tropical Crops and Pastures, Queensland, Australia.

Member Institutions/Individuals: Australia--CSIRO Division of Tropical Crops and Pastures; Fiji--Ministry of Primary Industries; Philippines--Philippine Council for Agriculture and Resources Research and Development, Bureau of Animal Industry, Central Luzon State University, Central Mindanao University,; Thailand--Khon Kaen University, Division of Livestock Development in the Ministry of Agriculture and Cooperatives; Malaysia--Universiti Pertanian Malaysia and Malaysian Agricultural Research and Development Institute; Indonesia--Balai Penelitian Ternak, Institut Pertanian Bogor, Universitas Gadjah Mada, and Universitas Udayana.

Early Leadership: Australian Centre for International Agricultural Research (ACIAR).

Network Expenditures/Budget: Plant nutrition program is budgeted at $253,098 for 3 years (approved 2 December 1985).

Funding Sources: Australian Development Assistance Bureau (ADAB), Australia.

Common Network Plan/Strategy: Yes

Common Research Methodology: Yes

Network Publications: Forage Research Newsletter (issue no. 1 published July 1986). Proceedings of some workshops also published.
Workshops and Conferences: Yes

Network Training: Yes

Remarks: Database to be assembled with information of scientists working on forages in the region, a record of literature published from within the region, and the proceedings of workshops and conferences. Sound idea to include extension people in the workshops.

References:

Forage Research Newsletter. Nos. 1-3 (1986).

File date: 10 January 1988

SUAN (Southeast Asian Universities Agroecosystem Network)

Contact Person and Address: Dr. Terd Charoenwatana, SUAN Chairman (1988-89), Faculty of Agriculture, Khon Kaen University, Khon Kaen, Thailand.

Focus: Farming systems/natural resource management. Interdisciplinary human ecology research having direct relevance to policymaking regarding development and management of renewable natural resources in tropical Asia.

Year Started: 1982

Member Institutions/Individuals: Multiple Cropping Centre (MCC) at Chiang Mai University, Thailand; Farming Systems Project (FSP), Khon Kaen University, Thailand; Institute of Ecology (IOE), Padjadjaran University, Bandung, Indonesia; The Institute for Environmental Sciences and Management, University of the Philippines, Los Banos; Cordillera Studies Center, University of the Philippines College, Baguio City, Philippines; East-West Center, Honolulu, Hawaii.

Number of Individuals Involved: Participation of interested scientists from other Asian institutions concerned with rural ecology is welcomed.

Region: Southeast Asia.

Countries in Network: Indonesia, Philippines, Thailand, U.S., China, and Viet Nam.

Legal Status/Formal Agreements: None. Informal association of university-based research groups.

Governance Mechanism: Governance provided by an informal council composed of senior scientists from the network's founding institutions.

Early Leadership: East-West Center, Honolulu.

Current Leadership/Coordination: Chairmanship of network rotates every 18 months with new chairman being drawn from the institution hosting the network's next scientific meeting.

Number of Network Staff (FTE): None

Funding Sources: Ford Foundation, East-West Center.

Common Network Plan/Strategy: Yes

Common Research Methodology: Somewhat; concepts in applied human ecology research provided by the Environment and Policy Institute (EAPI) of the East-West Center, Honolulu. Local adaptation of methodologies encouraged. All participants in the network share the following: (1) systems approach; (2) incorporation of social, cultural, and economic factors into analysis of rural ecosystems; (3) interdisciplinary team approach; and (4) concern with policy implications of research results for rural development.

Planning Procedures: Yes

Network Publications: IESAM Newsletter carries reports on SUAN activities.

Workshops and Conferences: Frequent regional workshops.

Indicators of Impact/Performance: Greater integration of social scientists in agroecosystem research Southeast Asia.

Remarks: A scientific consultation network, closer to an information exchange operation than a collaborative research effort. SUAN is reaching out to establish links with agroecosystem researchers in East and South Asia. In future, information exchanges may also be established with scientists studying rural ecology in Africa and Latin America as well. In 1987, SUAN undertook its first joint research project, a study of ecosystem interactions at the Phu Wiang watershed in northeast Thailand. The project is expected to continue for several years.

References:

Marten, G.G. and A.T. Rambo. 1986. Guidelines for writing comparative case studies of Southeast Asian rural ecosystems: report of the SUAN-EAPI workshop on Agroecosystem Analysis, Khon Kaen University, Khon Kaen, Thailand, 6-10 January 1986. East West Environment and Policy Institute, Honolulu, 36 p.

Rambo, A.T. and P.E. Sajise. 1985. Developing a regional network for interdisciplinary research on rural ecology: the Southeast Asian Universities Agroecosystem Network (SUAN) experience. ***The Environmental Professional*** 7:289-298.

File date: 2 February 1989

Trypanotolerant Livestock Network

Contact Person and Address: Dr. J.C.M. Trail, International Livestock Center for Africa (ILCA) Office, Productivity and Trypanotolerance Group, P.O. Box 46847, Nairobi, Kenya. Phone: 592066. Telex: 987 25747 ILCA KE.

Focus: Epidemiology and control of trypanosomiasis.

Year Started: 1983 officially, but the network began informally in 1981.

Member Institutions/Individuals: 20

Region: Tropical Africa

Countries in Network: Cote d'Ivoire, Ethiopia, Gabon, Gambia, Kenya, Nigeria, Senegal, Tanzania, Togo, and Zaire.

Number of Network Sites: >13 (Kolo, Mushie, Zaire; Tengrela, Boundiali, Cte d'Ivoire; Avetonou, Togo; Ogaprov, Gabon; Badeku, Fasola, Nigeria; Muhaka, Kenya; Mtwara, Tanzania; Ghibe, Ethiopia; Idiofa, Zaire; and International Trypanotolerance Sites in Gambia and Senegal).

Current Leadership/Coordination: ILCA. ILCA staff assemble data monthly in Nairobi, enter them on microcomputers. Floppy disks taken to Addis Ababa for analysis using a mainframe computer.

Network Expenditures/Budget: $350,000/year.

Funding Sources: Funds provided by African Development Bank for research project started in 1984 to study the productivity, health, and levels of trypanosomiasis risk in herds of N'Dama, a trypanotolerant cattle breed, in Gambia and Senegal. Other funding sources include the European Development Fund of the EEC, ODA, GTZ (Gesellschaft fur Technische Zusammenarbeit), Belgium's Administration Generale de la Cooperation au Developpement, and the governments of Switzerland, Gabon, Nigeria, France, May and Baker Ltd of the U.K., and the Netherlands (for Zambian part of network).

Common Research Methodology: Yes. Standardized data sheets to record information on animal productivity, animal health, and levels of tsetse challenge.

Planning Procedures: Yes, at internal workshop meetings, e.g. 30 November-4 December 1985.

Network Publications: Training manual published (see Murray et al., under references).

Monitoring Tours: Yes, mostly by scientists from ILCA and ILRAD (International Laboratory for Research on Animal Diseases).

Workshops and Conferences: Yes

Network Training: Seven-week course at ILRAD for network participants. Training is in epidemiology of trypanosomiasis and in surveying for tsetse flies. Two 7-week courses have been offered every year since 1982, one in English and the other in French. By the end of 1985, 42 people had been trained. In 1982 and 1983, ICIPE, Nairobi, assisted in the training program.

Remarks: A collaborative research network.

References:

Murray, M., J.C.M. Trail, D.A. Turner, and Y. Wissocq. 1983. ***Livestock Productivity and Trypanotolerance: Network Training Manual.*** ILCA, Addis Ababa, 198 p.

Trail, J.C.M., K. Sones, J.M.C. Jibbo, J. Durkin, D.E. Light, and M. Day. 1985. ***Productivity of Boran Cattle Maintained by Chemoprophylaxis under Trypanosomiasis Risk.*** ILCA Research Report 9, 76 p.

ILCA. 1986. ***ILCA Annual Report 1986: Livestock Productivity and Trypanotolerance Group.*** ILCA, Addis Ababa, 10 p.

ILCA. 1986. ***The African Trypanotolerant Livestock Network: Indications from Results 1983-1985.*** ILCA, Addis Ababa, 137 p.

ILCA. 1986. ***The ILCA/ILRAD Trypanotolerance Network: Situation Report, December 1985, Proceedings of a Network Meeting held at ILCA, Nairobi.*** ILCA, Addis Ababa, 98 p.

ILCA. 1986. ***IDEAS: A Microcomputer Package for the Comprehensive Evaluation of Livestock Performance in African Production Situations, Volume 1: An Introduction and Guide.*** ILCA, Addis Ababa, 74 p.

ILCA. 1986. ***IDEAS: A Microcomputer Package for the Comprehensive Evaluation of Livestock Performance in African Production Situations, Volume 2: Technical Reference Manual.*** ILCA, Addis Ababa, 188 p.

ILRAD Reports. ILRAD, Nairobi.

File date: 1 December 1987

WAFSRN (West African Farming Systems Research Network)/ RESPAO(Reseau d'tudes des Systmes de Production en Afrique de l'Ouest)

Contact Person and Address: International Institute of Tropical Agriculture (IITA), PMB 5320, Ibadan, Nigeria. Phone: 400300.

Focus: Farming systems. Short-term objectives are (a) to provide an inventory of institutions and researchers involved in farming systems research, training facilities, and sources of technical and financial assistance, and (b) to improve the flow of information about farming systems research through publication of newsletters, organization of workshops, and contact with national farming systems research programs.

Medium-term objectives are (a) to provide an acceptable zoning of West African farming systems to facilitate technical backstopping of farming systems research in the region, to advise in the recruitment of farming systems researchers, and to stimulate collaborative research on farming systems.

Long-term objective is to facilitate the design and implementation of a coordinated regional farming systems research program.

Year Started: 1982

Region: West Africa

Countries in Network: Benin, Burkina Faso, Cameroon, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Legal Status/Formal Agreements: Protocol of agreement regarding the posting of the coordinator with SAFGRAD. Protocol of agreement has been signed with the Scientific, Technical, and Research Commission of the Organization of African Unity.

Governance Mechanism: Steering committee provides guidance in planning research and drawing up work program. Steering committee is composed of nine members--seven elected as individuals, four of whom come from NARSs of the region (only one member can be elected per country), and two from non-national organizations. The secretariat is headed by a coordinator and is responsible for implementing the network's program.

Current Leadership/Coordination: As of 1986, Amadu Bello University, Zaria, Nigeria. Formerly, SAFGRAD (Semi-Arid Food Grain Research Development Project), Ouagadougou, Burkina Faso. SAFGRAD is organized by the Office of the Scientific, Technical, and Research Commission of the Organization of African Unity.

Network Expenditures/Budget: Proposed 3-year budget is $946,800.

Funding Sources: Still seeking ongoing support for core budget. IDRC has provided modest funding, such as Canadian $25,000 to support a working visit by the steering committee to the Southeast Asian Cropping Systems Network. The Farming Systems Support Project (FSSP) at the University of Florida, which is funded by USAID, provided $10,000 towards the cost of the first annual workshop; IDRC and Ford Foundation contributed Canadian $25,000 and $15,000 respectively for that workshop. CIRAD, France, has committed some funds for ongoing activities. IITA, Ibadan, Nigeria, provided start up funds of $14,500 in 1982. For 1988-89, IDRC, French Ministry for Cooperation, and the Ford Foundation will be donors.

Network Publications: Bulletin is published.
Annual Catalogue of FSR Institutions, Programs and Scientists in West Africa.
Annual FSR Bibliography

Monitoring Tours: As of 1986, only by steering committee.

Workshops and Conferences: Inaugural meeting held November 1982 at International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 1st annual workshop held 10-14 March 1986 in Dakar, Senegal; focus of this workshop was "Experiences in the implementation of farming systems research programs in national research programs in West Africa." The workshop was attended by 50 participants from 17 WAFSRN members. Biennial symposia held.

Network Training: None as of 1986.

Remarks: Although the network was established in November 1982 at a meeting at IITA, Ibadan, Nigeria, progress has been slow due to uncertainties regarding funding and coordination. Also, a push to start the network in a hurry.

References:
Faye, Jacques. 1988. West African Farming Systems Research Network: Activities and Work Program for 1988-89. In: ***Eastern and Southern Africa Network Coordinators' Review***, D.G. Faris and A.D.R. Ker (Editors), pp. 69-75, IDRC/CRDI/CIID, Ottawa.

Farming Systems Support Project (FSSP) Newsletters (University of Florida; FSSP folded in 1987).

WAFSRN Bulletin 1(1), January 1986.

File date: 1 December 1987

WARCORP (West African Regional Cooperative for Research on Plantain)

Contact Person and Address: Dr. George Wilson, Farming Systems Program, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Mailing address: IITA, Ibadan, Nigeria, c/o Ms. Maureen Larkin L.W. Lambourn & Co., Carolyn House 26 Dingwall Rd, Croydon CR9 3EE United Kingdom.

Focus: Improve plantain production by:

(a) creating an awareness of the importance of plantains,
(b) strengthening national research capabilities,
(c) coordinating research to reduce duplication,
(d) rapidly disseminating findings and recommendations,
(e) training people for research, production, and extension work, and
(f) encouraging national and international support for research and development.

Specific Projects:

SONADECI, Gabon: Studies on black sigatoka, including evaluation of fungicides and varietal susceptibility. Population variation in banana borer (*Cosmopolites sordidus*) and efficacy of insecticides.
IRA and IRFA, Cameroon: Screening cvs for susceptibility to pests and diseases. Effects of organic matter on yields. Evaluating cvs for tolerance to drought stress.

University of Abidjan, Cote d'Ivoire: Behavior of plantain plantlets developed by meristem culture.
IFRA, Cote d'Ivoire: Off-season production and intercropping of plantain with groundnut.

University of Nigeria, Nsukka: Effects of herbicides on weed control and economics of backyard production.

University of Science and Technology, Owerri, Nigeria: Effects of various mulching materials.

National Institute for Horticultural Research (NIHORT), Nigeria: Study of methods of preparing plantain chips and survey of the plantain/banana chip industry in Nigeria.

University of Ibadan, Nigeria: Preparation and storage of deep-fried plantain food.

University of Science and Technology, Kumasi, Ghana: Sink source relationships in fruit development.

IRA, Zaire: the use of water hyacinth as mulch.

IITA, Ibadan, Nigeria: proximity of mulch sources. Effects of various live covers. Field techniques for rapid multiplication. Reaction of cvs to rapid multiplication by meristem culture. Effects of land clearing and management. Effects of inorganic fertilizers and mulch. Evaluation and classification of cvs.

Year Started: 1981

Lead Institution: IITA

Member Institutions/Individuals: 12 institutions--Societi Nationale du Developpement des Cultures Industrielles (SONADECI), Gabon; Institut de la Recherche Agronomique (IRA) and Institut de Recherche sur les Fruits et Argumes (IRFA), Cameroon; University of Abidjan, Cote d'Ivoire; University of Nigeria, Nsukka; University of Science and Technology, Owerri, Nigeria; National Institute for Horticultural Research (NIHORT), Nigeria; University of Ibadan, Nigeria; University of Science and Technology, Kumasi, Ghana; Institut de la Recherche Agronomique (IRA), Yangambi, Zaire; IITA, Ibadan, Nigeria.

Region: W. Africa

Countries in Network: Cameroon, Cote d'Ivoire, Gabon, Ghana, Nigeria, and Zaire

Current Leadership/Coordination: IITA, Ibadan, Nigeria.

Funding Sources: International Fund for Agricultural Development (IFAD).

Workshops and Conferences: Annual meetings.

Network Training: Yes--short-term production courses, e.g. 1983 training course on meristem culture.

Remarks: Interesting that IITA is coordinator for a crop research network that is not one of its mandated crops. Points to the need for national institution building in W. Africa. INIBAP, a newer research network focusing on bananas and plantain, has global coverage, whereas WARCORP is a regional network. It appears that WARCORP is now largely subsumed under the much larger INIBAP.

References:
IITA Research Briefs 6(1):1 (1985).

File date: 11 January 1988

West and Central African Cowpea Network

Contact Person and Address: Jenny Cramer, Executive Assistant to the Director General, International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria.

Year Started: March 1987

Lead Institution: IITA, Ibadan, Nigeria.

Region: West and Central Africa.

Countries in Network: Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Cote d'Ivoire, Gambia, Ghana, Guinea Bissau, Guinea, Mali, Niger, Nigeria, Chad, and Togo.

File date: 5 July 1989

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