

THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH  
TECHNICAL ADVISORY COMMITTEE  
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DEVELOPMENT OF NEW CGIAR INITIATIVES  
ALTERNATIVE ORGANIZATIONAL MODELS FOR NEW INITIATIVES  
(Agenda Item 7 (a))

Objectives of the Discussion

In considering new CGIAR ventures, TAC 44 concluded that options of organizational structure should be examined by the Committee before proposals are presented to the Group for consideration. The attached paper has been prepared by the Secretariat for discussion with particular reference to the proposals for research on vegetables and on aquaculture which TAC is currently attempting to finalize.

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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DRAFT

ORGANIZATIONAL MODELS FOR NEW CGIAR INITIATIVES

TAC Secretariat

1. INTRODUCTION

TAC in its August 1985 Review of CGIAR Priorities and Future Strategies proposed that new initiatives might be taken by the Group if funds additional to those needed to support the ongoing programs became available. In line with its analysis that food production was still the major need to be addressed, ventures identified by TAC as deserving CGIAR support were research on vegetables, on oilseeds (coconut) and on aquaculture.

The Group accepted TAC's recommendations after considerable discussion at its meetings in November 1985 and May 1986 and at a special meeting called by the CGIAR Chairman in January 1986 in Bellagio. Much of the discussion centered on the need to find the best suited mechanisms for new CGIAR ventures to be launched in present conditions.

Several elements of the discussion in the CGIAR served to mold TAC's outlook on the modalities for new CGIAR initiatives. One was the apparent desire to expand greatly the involvement of national research systems fully as partners. A second was the necessity to formulate research objectives and strategies in a way to benefit the resource-poor small producer and poor rural laborer through increased income and greater food availability. Several Group members urged TAC to search out new mechanisms. Networks were mentioned in particular, and greater regionalization of networks was advocated.

Another consideration important for new CGIAR initiatives is scope (global or regional) and manner of CGIAR support. The global approach and effort espoused in early CGIAR-supported research on commodities has come to be seen to apply with particular force to only a few functions, including responsibility for germplasm. TAC has gone on record in its 1985 Review that future demands will reaffirm the international-center concept as the primary operational approach in the CGIAR System. Others, such as networking, could and will complement this approach but were not considered as viable alternatives to it. <sup>1/</sup> Nonetheless, TAC in its further elaboration did see networks as being appropriate mechanisms in some situations for CGIAR support or new CGIAR ventures. <sup>2/</sup>

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<sup>1/</sup> CGIAR Priorities and Future Strategies, Sec. 3.3.1, page 30

<sup>2/</sup> Ibid, p. 146, 221 (starchy banana); p. 163, 221, 235 (coconut); p. 221, 234 (vegetables); p. 165, 235 (aquaculture).

This paper seeks to identify alternative organizational structures for new CGIAR ventures and to evaluate the suitability of existing structures and models. Six existing organizations, and one structure proposed at TAC 44, are described briefly in Annex I. Upon consideration of organizational requirements for and applicability to new CGIAR ventures, the following six models are proposed and described in Section 3:

- International Center
- Regional International Center
- International Research Directorate
- CGIAR Consortium
- International Facility for Institution Building and Research
- International Agricultural Research Support Service

## 2. ESSENTIAL AND DESIRED CHARACTERISTICS

Programs supported by the CGIAR must a priori have certain characteristics. These characteristics derive from the goal of the CGIAR (see Annex II).

- (a) The programs or activities must address one or more food production problems that are clearly important for at least two developing countries.
- (b) Components of the CGIAR goal which should be furthered and in no event disregarded include:
  - participation by and benefits to small farmers, especially resource-poor producers;
  - sustainability of production.
- (c) The effort must concern food production problems the solution of which is considered feasible through agricultural research.

For new CGIAR ventures, fit with current System strategy and contribution to achievement of the goal of the CGIAR will be important. Among the features desired in new CGIAR ventures will be those which characterize activities currently supported (see e.g. Annex III) and the following:

- (d) A major role for national institutions ("NARS" hereafter) in research priorities setting, and in planning and assigning the execution of research and related activities ("research" hereafter, where appropriate), i.e. a partnership approach.
- (e) An increase in the efficiency of the research through harmonization, e.g. avoiding undesirable duplication, distributing tasks according to accepted criteria, standardizing approaches and methods, etc.
- (f) Speeding the strengthening of NARS to enable coping effectively with current and future needs, inter alia through support to:

- (i) increase and improve capacity for research planning, execution and management;
  - (ii) stimulate, organize and coordinate the development of human and material resources and of information exchange and flow.
- (g) The ability to harness assistance from all useful sources of help: donors, institutions and scientists in developed countries, governmental and non-governmental organizations, international agricultural research centers, NARS and institutions and scientists in developing countries, etc., together with the ability to organize the various resources available from diverse participants (e.g. NARS, CGIAR, advanced institutions) for effective support of the research effort.
- (h) An effective and efficient scientific and managerial core including:
- (i) strategic research capability, and
  - (ii) accepted and respected leadership dedicated to achieving progress, to measuring that progress objectively, and to being open to critical evaluation and self-evaluation.
- (j) Good prospects for increasing national priority and resources for the research undertaken by participating NARS and consequently for phasing out some (or all) CGIAR support.

Any attempt to rank the features that should be reflected in the organizational structure of new CGIAR ventures will be subjective. The collective judgement of TAC might be called upon to propose the features and their ranking which could then serve to assess the merits of existing and proposed organizational structures.

In this regard, one crucial issue on which a policy statement by the Group may be needed is the importance to be given respectively to the timely achievement of needed research results and to the effort to have NARS participate as full partners. Both are clearly desirable. The international-center concept was born to emphasize research results, but was soon modified to give attention to the strengthening of NARS. ISNAR was born to emphasize the strengthening of NARS, and TAC included this as one of eight objectives that comprise the CGIAR goal.

A related important issue is "in-house research". The existence of small and weak NARS, often in groups in a region, argues a need for prolonged international support to obtain needed results of strategic and applied research in a timely fashion. Also, rapid strides in generating useful new technology demand concentrated and targeted research effort. A solid in-house strategic and applied research capacity (multidisciplinary-team approach to solution of problem) may then be required. Even where timely availability of research results is not the primary aim, new CGIAR ventures ought to have the research capacity at their command, whether in-house or purchased, at least initially.

### 3. SOME ORGANIZATIONAL MODELS EXAMINED

Many names have been given to mechanisms created to organize international agricultural research in some manner: association, board, council, institute, network, organization, program, project, service. The structure of these mechanisms varies widely to fit the exigencies of need, resources, or control.

Most national agricultural research efforts have been organized on a model of centralized, top-down structure. In larger countries this structure may loosely incorporate sets of centralized-structure institutions under the authority of political subdivisions below the national level (province, state, district).

The CGIAR Centers have employed a largely centralized model. The international-center concept allows a high degree of center autonomy over its research program. Several variants of the international-center structure have features of interest for new CGIAR ventures.

Networks relevant to international agricultural research have a long history. But only during recent decades has the term "network" to denote a more decentralized grouping with common interests come into vogue. Networks are diverse in many ways, including in organizational structure.

The structures of some ongoing ventures to organize agricultural research are described in Annex I. With special reference to the proposals on vegetables and aquaculture research under discussion in TAC, the degree to which a proposed model will

- emphasize control over the research respectively by the CGIAR entity or by the NARS
- emphasize the timely availability of research results and free/equitable access to them

would be very important. Hence, one useful order of desired features will be along a continuum from maximal emphasis on timely achievement of research results to maximal emphasis on strengthening of NARS and on control over the research by NARS. This order is adopted in the following examination of models of organizational structure for new CGIAR ventures.

#### Building on Existing Centers' Strengths

The facilities, the contacts with NARS, the international status of Centers will permit an early and effective start on new research activities in plant breeding and other plant yield or quality improvement technologies, e.g. for vegetables research and also for coconut research. Even some of the expertise assembled will be valuable, for scientist interaction if not for direct support of research.

Additionally, Centers have become a reservoir of useful knowledge on farming systems and on on-farm research and the relevant relationships to on-station research.

Building on existing Centers' strength could give rise to three models for new CGIAR ventures.

A. International Center

In the particular case of vegetable research, for example, evolving political rapprochement could conceivably end the forced isolation of AVRDC from some countries. If the Board of AVRDC would wish it, and the government of RoC (Taiwan) would issue a new charter, the Center could become the International Vegetable Research Center (IVRC) in the CGIAR family. IVRC would have a global mandate in the System for all vegetables not already looked after by other Centers and could have an operational mandate reflecting the priorities set by TAC/CGIAR.

Its operational strategy might utilize regional networks, initially Center-run (coordinator fully a Center staff member) but increasingly inter-partner in nature until the network becomes the structure and organ of the partners with the Center taking a back-stopping and specialized research role (node). This process could be built into the strategic plan of the venture from the start and be given a suitable time frame.

B. Regional International Center

A similar result may be achieved by giving regional mandates, perhaps with emphasis on agroecological zones, to existing Centers, viz. IRRI, ICRISAT, ICARDA (with irrigation), ILCA, IITA, CIAT and CIP. An advantage of this model is the possibility to tailor priorities from the beginning to the needs of regions. The operational strategy could be as under A. above.

C. International Research Directorate.

A global mandate in the CGIAR System would be vested in an International Research Directorate (IRD) under a CGIAR-style Board. IRD would have control over and direct research and training activities, but have no campus (although its main office might be located at a Center). The IRD would make use of Centers (including AVRDC). By agreement with the Board and DG of a Center, a program with a multidisciplinary team under a Program Leader would be created and administratively hosted by the Center, with technical and budget direction and research coordination being exercised by the Director (and staff) of IRD. The IRD office would also look after information flow and exchange (publications, meetings) and after training arrangements.

Most regions could be covered by locating programs at the Centers mentioned in model B above, and phasing could be done conveniently by gradually establishing programs in line with priority needs for attention and with feasibility.

Initially, the programs could be the foci of networks that would link NARS into the research effort and be run by IRD. The aim should be to transfer responsibility for running the networks to the NARS network members. The process of transfer could be linked to the phasing-out of CGIAR support to selected network activities; it might lead to a PRECODEPA-style network.

### Building on Strengths Outside the Centers

In some fields in which the technical expertise of Centers is not well developed, institutions exist whose strengths could be marshalled by CGIAR members. This is the case with aquaculture, one of the new ventures under consideration, a field in which a relatively strong set of national institutions of developing countries already exists (NACA), as well as a number of advanced research institutions in developed countries.

The CGIAR contribution would be principally to arrange for research to be carried out which was beyond the capacity of the national institutions of developing countries.

#### D. CGIAR Consortium

A fund would be created by the CGIAR to support a small office for consortium management (1) and technical staff (2-3) for liaison and information-flow functions. The consortium office, which might be located in an existing institution, would work closely with the research implementation and coordination arm of the group of institutions of countries that had joined in a given research effort (e.g. for NACA at present the UNDP-funded coordinator). Principal functions of the consortium office would be to

- (i) identify needed research which is beyond the capacity of the NARS in the group
- (ii) develop and maintain a catalogue of relevant research capabilities outside the NARS group
- (iii) bring pertinent external research capabilities to the attention of the NARS institutions (and facilitate liaison)
- (iv) bring the identified research needs that are beyond the capacity of NARS to the attention of specialized or advanced institutions (and facilitate liaison)
- (v) assist when necessary in finding funds for research activities resulting from (iii) and (iv).

One advantage, in addition to benefits to all from closer linkages, would be the likelihood that research could be funded also from sources outside the CGIAR budget (university, Title XII, education-oriented development assistance, IFS, NGOs, etc.).

### Building Stronger NARS for International Research

Models A-D emphasize the timely availability of useful research results. Model D in particular is in the spirit of integration of efforts in a global agricultural research system.

Two models can be envisaged in which the initial action is on the strengthening of the NARS: (i) emphasis (budget?) about equally strong on obtaining useful research results and on strengthening NARS; and (ii) emphasis dominantly on strengthening NARS (though within the context of efforts to obtain useful research results).

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### E. International Facility for Institution Building and Research

A CGIAR International Facility (I.F.) which would initially devote about equal effort on the one hand to building NARS institutions and inter-NARS (usually regional) linkages and on the other to research has to be able to command the means to achieve both aims. In its pursuit of both, the I.F. has to be guided by the wishes of the group of NARS (say in a network). Initially the I.F. has to be the independent decision-maker on research implementation under a strategic plan developed and as necessary adjusted with the consent of the group of NARS which the I.F. exists to support.

The model is essentially that proposed to TAC 44 for the new CGIAR initiative on vegetables research, i.e. including an in-house research capacity. Development of the I.F. and of its strategic plan would be as indicated in Figure 1 for one region. A global strategic plan for the I.F. could be arrived at by a Continuing Global Advisory Committee (consisting of the members of the Regional Advisory Committees) and giving it the task to propose such a plan. The strategic plan would, however, be as oriented towards and explicit on NARS institution building and inter-NARS collaboration as on research objectives and the course to be taken to reach them.

Initially, the organizational structure could be devised as shown in Figure 2. As NARS partners gain strength and inter-NARS linkages for research on international problems become reliable (tasks under the I.F.'s institution building mandate with input from ISNAR and IFPRI), the direct conduct of research and the support to research in the NARS (e.g. by posting of experts) would decrease and be replaced by increasing functions of network research contracting and coordination. The I.F. would become the facilitator of research and related activities in the network, with the coordination function growing to become dominant and to include also institution building. Once the network has become a viable entity, the I.F. could be replaced by a small CGIAR body (partly INIBAP-style) looking after "global coordination" which might include (a) linkages and coordination (i) among several regional networks dealing with research on the same commodity or problems and (ii) between such networks and relevant activities outside them, and (b) responsibility for custody and maintenance of e.g. germplasm collections, or for other matters where international status may be important.

### F. International Agricultural Research Support Service

The International Agricultural Research Support Service (IARSS) would be a CGIAR effort designed principally to support the NARS of groups of countries in their joint research endeavours.

In the context of a model for one or more new CGIAR ventures, IARSS might be conceived as a flexible mechanism to support the development of inter-NARS groups ("networks" hereafter) into effective and efficient generators of equitably accessible new technology, of internationally needed research results. The inter-NARS groups might be formed around problems appropriate for CGIAR support, but linked to either commodities or around major fields (soil, water), so as to



envisage a degree of permanence to the network structure within which specific problems would be taken up and dropped over time.

IARSS might serve many networks and could then be viewed as similar in its non-technical functions to the role of FAO for ESCORENA. The Service could usefully be located with a cosponsor or institution whose facilities would strengthen the delivery of services (communications, international status, etc.)

The principal functions of IARSS in regard to a given network would be to assist in the

- formation of the network (if it does not exist)
- development of the network into a viable instrument for generating new technology (internationally needed research results)
- funding of international (e.g. regional) research conducted by network partners
- strengthening of the network through generating support to information exchange and human resources development for international research.

The IARSS has also the function of linking the network to relevant external efforts and wealth of knowledge and of material. Where the network is or becomes one in a set of networks, IARSS may take on the coordinating role for the entire set.

The model provides the flexibility to fit at any stage in the development of inter-NARS linkages from non-existent to firmly established.

The structure in the initial stages of formation and development of the network will be similar to the I.F. model E (see Figure 2), except that there would be no in-house research capacity. IARSS would, furthermore, work to a strategic plan approved and monitored with the full participation of the network. Its Board would serve a role of "donor support group" and might be just that.

IARSS would consider itself as an agent of the network in finding and funding expertise and other resources for use in the network and also external to the network for its benefit. The executive of the network (coordinator) could be IARSS staff for greater simplicity of structure, as there would be no conflict of interest.

The IARSS would be established most efficiently to cater for the needs of a set of networks or of a network with subnetworks. The executive of IARSS could be the "manager" or "administrator" of the Service who might, alone or with a deputy, direct the staff in its network support functions.

A possible IARSS structure is shown schematically in Figure 3 as it would be constituted while a set of networks was still in need of support for development of research capability and of linkage

mechanisms. Ultimately, with respect to each network as it matures, the structure would become reduced to provide little or no staff support to the coordinator and to perform enhanced inter-network and external linkage functions.

#### 4. OBSERVATIONS ON RESEARCH AGENDA AND RESULTS

Control over Research Agenda. The mandate and the accepted value of continuity in long-term research gives the international center a fair degree of control over the research it pursues, once the funds for core support have been secured. Collaborative research networks of NARS may arrive at a similar degree of control after reaching consensus or majority decision on research agenda, provided outside funding is assured at least for coordination, monitoring and evaluation, and for costs of participating NARS involving network (non-national) research. The consensus or agreement reached is likely to be fragile, but can be strengthened by donor-coordinator joint planning.

Control over the research agenda by those for whom the results are intended, chiefly the NARS, is strongest within the national system and next strongest in the collaborative research network which is managed and coordinated by the participants themselves. Networks with NARS steering or advisory committees may bring the views of NARS to bear, but may not provide means for reaching inter-NARS consensus, nor reflect the majority view if the committee members act in personal capacity or are drawn from too small a number of participants.

Presumably, research ventures designed to be run eventually by the users of the results should provide for phasing-in of NARS control over the research agenda if they do not place such control in the hands of participating NARS from the start.

Pursuit of Research Results. When resources are limited, concentration on reaching fairly narrow research objectives is considered to be an indispensable ingredient in obtaining research results in a timely fashion. That is the rationale for putting together a "critical mass" of talent and materiel, characteristic of the international-center concept. Similarly, in network operations success seems most likely when the research objectives are few and sharply focussed. A narrow focus can be built into a strategic plan, but can probably be maintained only if strong leadership is exerted at some point (donor-coordinator, or lead NARS institution). "Timely" achievement of research results is usually poor in the start-up phase of networks and depends on effective participants or effective incentives and coordinators in the later stages.

Access to Research Results. An interest in "impact" and no interest in exploitation prompt international centers to allow and facilitate access to their results by any and all NARS. International-center run collaborative networks may do so also. Individual scientists (also in NARS) have an interest in the recognition which comes with wide application of their research findings. There may however be obstacles (political, legal, patents, others) to equitable access to results generated by national institutions participating in collaborative research efforts (especially network "lead" institutions which often are in stronger NARS).

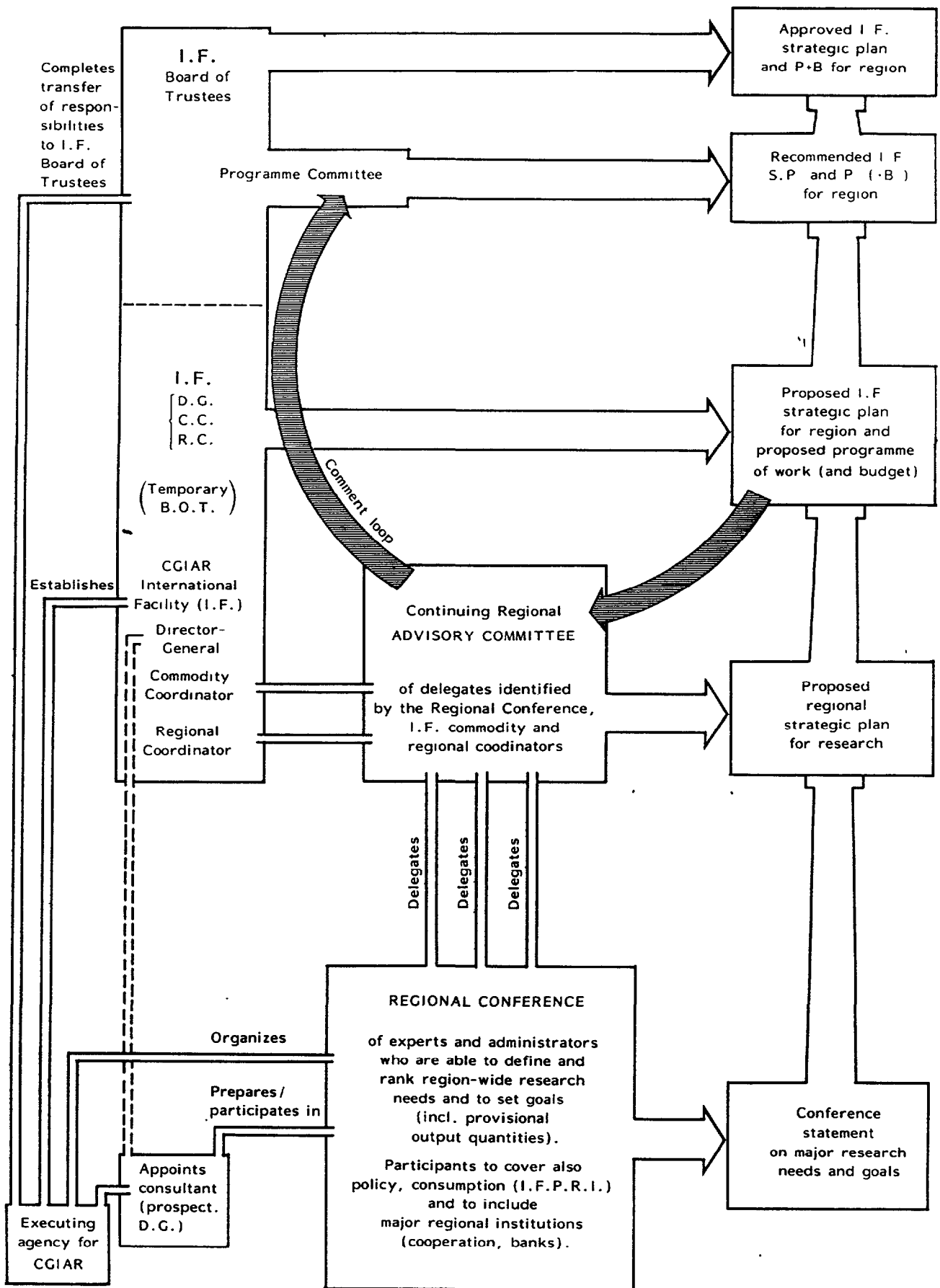
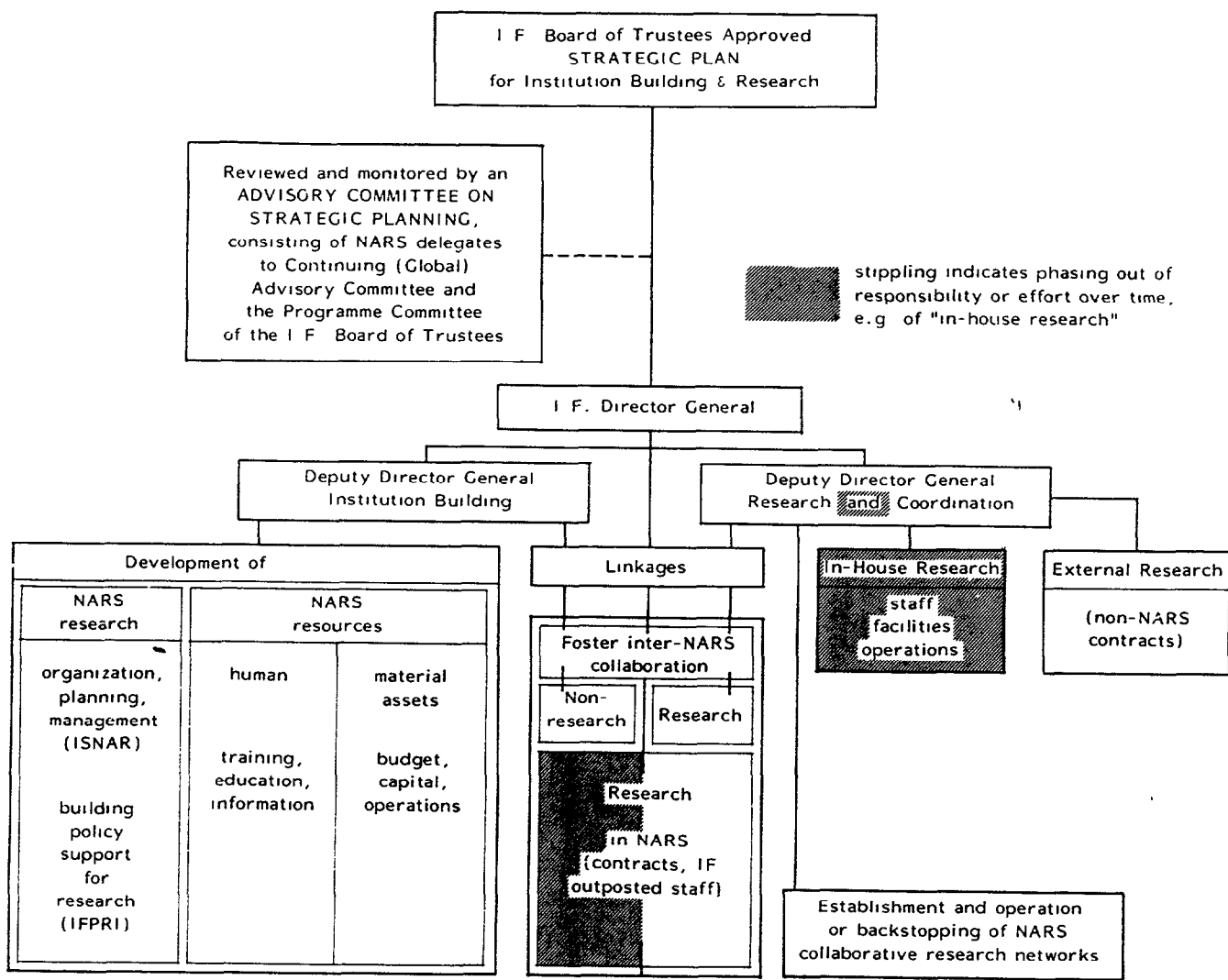


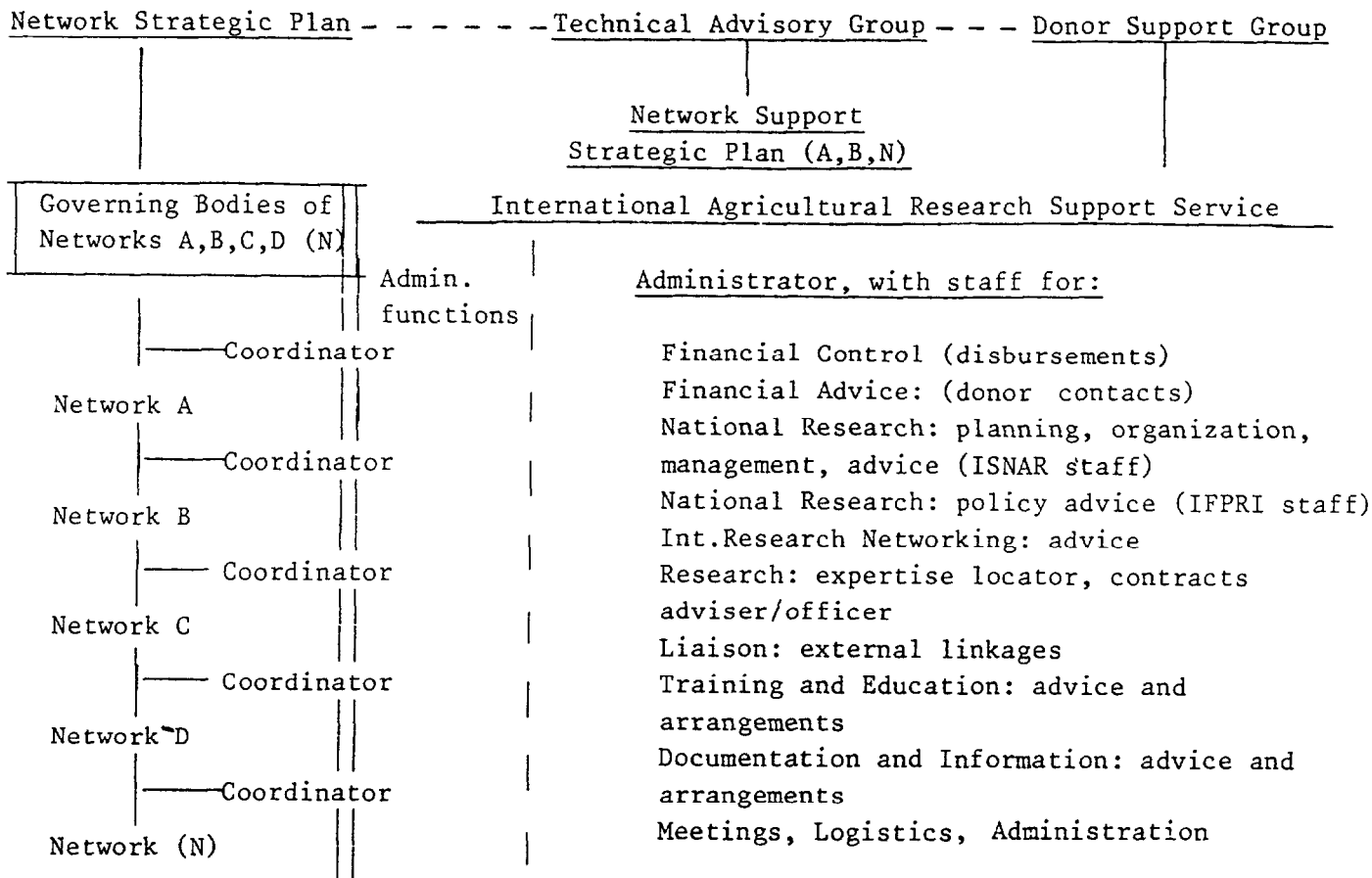
Figure 1. Deriving the regional Strategic Plan for a CGIAR International Facility for Institution Building and Research (I.F.) by a



**Figure 2.** Organizational structure of a CGIAR International Facility set up to devote about equal attention initially to institution building and to research.

After some time with strengthening of the NARS and of inter-NARS linkages (stippled areas), the in-house research capacity would disappear e.g. by transfer of facilities to host NARS and the linkages functions would grow. The DDG-Research and Coordination would become the DDG-Research Coordination, retaining control over external research contracts, continuing to share in letting research contracts with NARS, and concentrating on developing and operating or supporting collaborative research networks of NARS.

Further progress in strength of NARS networks should be sought to enable phasing out of the I.F., putting in its place NARS-network operated mechanisms, with CGIAR taking on global coordination functions (if useful) to provide links among regional networks and access to research or technical support external to the networks.



**Figure 3.** Organizational Structure of an International Agricultural Research Support service (IARSS) and relationship to the networks which operate under their own governing bodies and strategic plan. At an earlier stage, network formation and elaboration of a network strategic plan may have been facilitated by a structure as shown in Figure 2, and the above scheme may be imagined as evolution towards full network self-determination and progressively lower levels of CGIAR support. The IARSS administrator would be appointed and would, with the network coordinator, draft a Network Support Strategic Plan based on the Network Strategic Plan. A Technical Advisory Group, made up of the network coordinator, IARSS administrator, 3-4 senior scientists in the particular field from inside and 3-4 from outside the network and chaired by a representative of the donor support group, would review the draft and approve and periodically revise a Network Support Strategic Plan, which would be essentially the guideline (perhaps after TAC review of the plan) for setting up and operating the IARSS. A network might be serviced by IARSS for a specified period (10 years) during which time it should strive to acquire capability in all of the functions provided by IARSS. As soon as feasible for any one network, IARSS should withdraw direct support and increase its emphasis on residual international functions for the network: linkage to sources of technical support or research external to the network and linkage among networks (in a set, or regional, or regionally separated sub-units) in order to achieve a degree of global coordination. IARSS may also, at the option of the donor support group and the network, continue to serve as channel for funds. IARSS performance could be monitored periodically by TAC's EPR mechanism, but at shorter intervals by, or at the behest of, the Technical Advisory Group.

Organizational Structures of Some Ongoing Agricultural Research Ventures

1. National Agricultural Research Organization

The Indian Council of Agricultural Research (ICAR) is the apex institution in a highly structured system consisting of 38 central institutes, 11 national research centers, 5 project directorates and associated universities. It evaluates and approves/finances research projects (designated "schemes") proposed by these units after multiple screening at lower levels of proposals that originate with scientists. ICAR also finances recurrent costs in part for "schemes" of state governments and in part or total for "schemes" of universities and private institutions.

Organization:

Governing Body (Eminent scientists and others, chaired by Minister) - policy, P&B approval

Executive (Director General; Vice President of Council)

Advisory Board (chair: DG-ICAR) - recommends on research and education

Standing Committee(s) (chair: DG-ICAR) - assists/advises Governing Body on acceptance and reviews of research; coordinates research

Scientific Panels (by discipline or commodity) - review project proposals, recommend acceptance to Standing Committee

Staffing: The executive officer (DG) heads a technical corps under 5 deputies (crop sciences; animal sciences; soils, agronomy, irrigation and agric. engineering; agric. education; extension). On the administrative side he "is assisted by the Secretary of ICAR who is ex officio Joint Secretary to the Government" and supporting staff, and he has as Financial Adviser a Joint Secretary in the Ministry of Finance, accredited to the Ministry of Agriculture.

The above full structure may have been considered inadequate to give impetus for timely achievement of research results that were urgently needed in many different-environment parts of India. ICAR began to sponsor in 1957 an "All-India Coordinated Maize Breeding Scheme", and similar schemes (All-India Coordinated Projects) were created for rice and other commodities and for problems of soils, water management, fertilizers and cropping patterns.

2. International Agricultural Research Center

The characteristics implicit in the international-center concept have been described by TAC (Annex II). A center with a global mandate for research on a commodity, would have the following basic organizational structure:

- International Board of Trustees (mainly eminent scientists), autonomous, self-perpetuating; approves program and budget proposed by the Director General.

Operates through Chairperson, Executive Committee, Program Committee and others.

- Director General appointed by BoT and ex officio BoT. He is the chief executive officer of the center and appoints all staff.
- A deputy heading the administration and staff.
- A deputy, heading the research effort which is organized with a senior scientist serving as leader of each program in the problem area, and scientist and support staff providing a "critical mass" for efficient research.

The need to work in many locations and with institutions in many countries led to making provision for "outreach" activities involving research (including germplasm testing networks), training and information.

The above general characterization may be applied to the commodity centers, namely CIAT, CIMMYT, CIP, ICARDA, ICRISAT, IITA, ILCA, IRRI and WARDA.

Research has undergone regionalization in all of the commodity centers, in some cases mainly on a geographical basis, in others (ILCA, WARDA) mainly on an agroecological zone basis. An example of an increased measure of autonomy from center headquarters is the ICRISAT Sahelian Center (a linked 2-center model).

The following means employed by CIP to increase the efficiency of research and/or the capability of the NARS are typical of the options available to the Centers and in some form or another used by them.

(i) Contracts. Obtaining research results by contract to advanced institutions has been a regular and efficient method from CIP's beginnings. Value and efficiency depend on available knowledge and capacity in the partner institution. Increasingly, partners are located in developing countries.

(ii) Planning Conferences. Originally designed to keep the thrusts of CIP's work at the forefront of science, these bring to bear the views and work of external scientists engaged on research in the relevant areas. More and more the external participants come from NARS. The planning conferences are said to provide a form of peer review.

(iii) Outposting in NARS. CIP has followed a course of strengthening NARS by having staff working in good measure within the national organization (e.g. in Colombia, Philippines). Strengthening is accelerated by tailored training of NARS staff, including at senior research level.

(iv) Regional Network Support. CIP has sought to promote the establishment of collaborative research networks among NARS of countries in 5 regions. CIP plays roles of technical backstopping, identification

of donor support, and administration of funds for projects of the networks. CIP may provide the coordinator initially, but the aim is for the network to choose and support him.

IBPGR, IFPRI, ILRAD and ISNAR, have about the same organizational structure as the commodity centers. The term "laboratory" may denote an emphasis on strategic and even basic research conducted at ILRAD to deal with two major livestock diseases in Africa.

IFPRI's research is on policy in the wider field of food and agriculture. The headquarters are a place for interaction among individual researchers, harmonization among them, and synthesis on policy issues. Research is done away from headquarters, most often collaboratively with researchers and institutions in developing countries. Research is of relatively short duration, but may be "revisited".

Part of IBPGR's mandate is to stimulate action needed to build national plant genetic resources capacities and to link these in a global network. The linking function has not been well served so far. IBPGR has acted as adviser to NARS and as provider or locator of funds. IBPGR utilizes expert committees and working groups to advise its Program Committee on priorities for plant species and PGR activities.

For ISNAR, the term "service" may denote an emphasis on "technical assistance" to developing countries in planning, organizing and managing agricultural research effectively. Like with IFPRI, the headquarters serve more for interaction among the staff and for harmonization and desk research, and the "service" is performed mainly on site in and to individual developing countries. Typically, activities in any one country are concentrated over a relatively short period with a long and looser follow-up.

Among non-CGIAR "centers", AVRDC, ICIPE, IFDC and IIMI have the international-center model of organizational structure. ICLARM is similar except that it does not have its own research facilities, forcing greater reliance on operations in conjunction with NARS. ICRAF has facilities for demonstration but not for research, and is seeking to collaborate with NARS by acting as the hub of agroecological-zone networks. IBSRAM and INIBAP are discussed in the following section on networks.

### 3. Agricultural Research Networks

A simplified description of different types of networks is given in Table 1.

The networks discussed in this section are "collaborative research networks", as these are the types of interest for new CGIAR ventures designed to generate technologies. Collaborative research networks normally carry on such complementary activities as information exchange and flow, training, testing, and identification-planning-harmonization of research.



The requirements and characteristics of successful networks have received much attention in the past five years. A thorough discussion with particular application to the CGIAR was presented by Plucknett and Smith. The available evidence on success, reviewed at the IFARD meeting in October 1986, led to 8 characteristics or criteria being derived and annotated (Appendix 1 to Annex I - Page 10). The IFARD meeting report suggests that the participation of a strong institution (IARC, IICA, FAO) is essential.

Another recent examination of networks and the conditions for their success has been undertaken by SPAAR. This study looked at sub-Saharan Africa where the weakness of most of the NARS is considered to be a major stumbling block to progress in agricultural research and production/productivity. SPAAR's list of desirable characteristics of collaborative research networks is reproduced in Appendix 2 to Annex I - Page 12. A "coordinating entity, which might initially be an IARC" was considered essential, but its staff must be "small and lean so as to operate efficiently. A network model that includes NARS, a steering committee and a coordinating institution is highly desirable, but organizational features should remain flexible to accommodate circumstances".

A brief description is given of the function and organizational structure of the following collaborative research networks that may have relevance to new CGIAR ventures:

PRECODEPA, estab. 1978  
 NACA, estab. 1979  
 Nile Valley Project, estab. 1979  
 IBSRAM, estab. 1983  
 INIBAP, estab. 1985  
 Vegetable Research Proposal to TAC, March 1988  
 ESCORENA, estab. 1974 ... 1979.

Also relevant will be proposals to TAC 45 on organizing research in aquaculture.

a. PRECODEPA A regional cooperative program for potato research and production. Scope: Central America. Single commodity. Legal Status: None. Members: Nine countries of Central America plus CIP. Note: All member countries use Spanish. Origination: New approach arose informally in conducting one national training program (Mexico) in 1977. CIP was approached, then a donor (Swiss Development Cooperation).

#### Organization

Permanent Regional Committee: 2 persons from each member country or CIP with one vote per member, meets annually in a different member country, sets policy, allocates budget, examines work proposals, approves projects and assigns leadership for them, elects the Executive Committee, one member of which is the coordinator.

Executive Committee: Three countries, designating respectively a coordinator, an assistant coordinator and a secretary. The EC meets about four times per year to implement the decisions of the Permanent

Regional Committee and to direct program execution (including contracts) and evaluation (reviews).

Coordinator: Rotating every two years among members, a person named to this function is the key executive responsible for administration of the regional projects and funds for them, compilation of research proposals, coordination of review activities and follow-up.

Implementers: NARS programs execute projects, make proposals, report results, seek practical use of results. A lead country (person) coordinates the activities on a particular problem undertaken in different NARS.

Financial Flow: From donor through CIP (legal status, accountability) to NARS units upon request of coordinator and project leader.

National accounts are aggregated in PRECODEPA annual report which is audited by an international accounting firm.

An evaluation of PRECODEPA was made in 1984. The evaluation identified several strengths:

- selective leadership (acceptance by all of one NARS per problem taking leadership role);
- promotion of horizontal cooperation;
- optimal use of scarce resources;
- encouragement of participation and self-reliance.

An observation deemed important (and unexpected) was growth (by 3 to 4 times) and continuity of research cadres in national potato research and extension.

Weaknesses identified and said (end 1985) to be addressed were:

- (i) lack of legal status
- (ii) lack of instruments for the planning process (programming and budgeting)
- (iii) inadequate monitoring and evaluation
- (iv) lack of serious emphasis on socio-economic aspects
- (v) limited communication and diffusion of results
- (vi) weak relationship between research and extension
- (vii) outside financing of the regional research program
- (viii) administration of the operating funds.

b. NACA (Network of Aquaculture Centers in Asia), one of four regional (plus one global) projects funded by UNDP and backstopped by FAO's Aquaculture Development and Coordination Program. Scope: Selected organisms that can be grown in aquaculture in Far East countries. Legal Status: International Project. Works mainly with NARS institutions. Members: Eleven countries (governments) from Philippines to India are participants. Note: Communication throughout the network is in English. Origination: TAC identification of priority in 1971-1974. FAO Technical Conference (Kyoto 1976) made recommendation to establish networks.

#### Organization

Advisory Board (now Provisional Governing Council): sets policy, reviews programs and progress, guides network.

Executive: Project Coordinator (UNDP staff): executes P&B laid down in project document; coordinates activities under projects, including contracts.

Technical Core Group: in preparation for change to intergovernmental status, group is being formed to take over tasks of international experts now under coordinator.

FAO: Service unit backstops various activities for NACA and aquaculture networks in other regions.

Implementers: Four lead centers in 4 countries, each for a different research area. Lead centers are increasingly being linked to NARS, in effect becoming the hubs of subnetworks.

Financial Flow: From UNDP/donors to coordinator for disbursement and control under UNDP regulations and project budget.

c. Nile Valley Project Originally a two-country, since 1984 a three-country project financed by IFAD to which ICARDA provides technical and logistic support. Legal Status: International Project. It links mainly scientists working on one crop (faba bean). Note: Communications in English, though Arabic is used between two of the countries. Origination: ICARDA and NARS of Egypt and Sudan developed project. Ethiopia joined in 1984.

#### Organization

Coordination Executive Group: National program coordinator and national research coordinator (project staff) of each of the 3 countries, and ICARDA international, technical and administrative managers. Group annually decides on project operations, i.e. research to be funded.

National Program Coordinators: One per country, oversee program, liaise with government at highest level.

Executive: National Research Coordinators: One per country, coordinate research of scientists, propose priorities.

ICARDA: Technical backstopping, financial and administrative services.

Implementers: Scientists at national institutions.

The project may become a three-country program in 1988, supported more at the development interface by IFAD.

d. IBSRAM A body to promote research on soil problems and soil management, chiefly through establishment of problem-defined networks of national institutions, but directed to their scientists.

Scope: International, based on problems of the soil. Origination: TAC discussions during 1970's leading to 1979 Interim Committee and 1983 funding by some CGIAR members.

#### Organization

Board of Trustees, Director, Staff: (Essentially on international-center model, without research facilities).

Network Coordinator: IBSRAM staff, located in region (networks created or under development are regional in scope).

Network Coordinating Committee: NARS scientists having relevant expertise, representatives of main donors, and IBSRAM coordinator; screens research proposals of scientists or institutions.

e. INIBAP A coordination directorate (superstructure) to link and support regional networks in research on bananas and plantain. Scope: International. Origination: CGIAR members, concerned about potential loss of germplasm, moved rapidly in 1984 to establish a mechanism to coordinate and channel funds to research on two important subsistence and export crops.

#### Organization

Board of Trustees, Director, Technical Adviser, Information Specialist:

Essentially on international-center model, with international status.

Operational Units: Regional networks. A Steering Committee of NARS representatives, to which an INIBAP-staff Coordinator is secretary, directs and guides the research.

Inter-Regional Coordination is effected under guidance of Technical Committees (subject-specific) by INIBAP, mainly through regular meetings of coordinators.

Global Coordination is effected by INIBAP Hq. staff for research outside the networks that is in support of the networks: links to IBPGR, universities, advanced institutions.

f. Vegetable Research Proposal A proposed mechanism for research implementation and coordination characterized by bottom-up development and adjustment of priorities and strategies and top-down decisions on implementation of research, with contracts and coordination as the principal operational features. Scope: Global for commodities, regional for research support. Legal Status: International Unit. Membership: Open to all countries.

#### Organization

##### RESEARCH AGENDA

Regional (Continental) Conferences, NARS scientists and administrators, state research needs and goals and review these at intervals

(Global) Advisory Committee, delegates chosen by the Conferences, plus entity regional and commodity coordinators, proposes strategic plan

Entity Management, DG plus regional and commodity coordinators, propose research program and budget

##### RESEARCH IMPLEMENTATION

Board of Trustees, CGIAR-style, selects DG, approves P&B Program Committee, possibly program regional subcommittees

Director General and staff (contracts, training, information exchange) develop and move forward the program by influencing implementers through:

Commodity Coordinators, with global technical responsibilities, and

Regional Coordinators, with cross-cutting research support and regional representation responsibilities

Contracted Specialists provided to implementers

Implementers: NARS network partners.

g. ESCORENA (European System of Cooperative Research Networks in Agriculture). A collection of 10 research networks established, sponsored and overseen by FAO Regional Office for Europe. Eight networks are for research on commodities and two for research on waste utilization and trace elements. Legal Status: None. Scope: regional (Europe, with some participation of Mediterranean-climate developing countries of Asia and Africa, and some others). Members are countries (each with 1 vote in network consultations, regardless of number of adhering institutions per country). Financing of research and meeting attendance by participating institutions/countries.

### Organization

#### RESEARCH AGENDA

Network Consultation, all member countries, defines, reviews, revises research areas and program at 3-4 year intervals, by consensus

Subnetwork (3-6 per Network), interested members/institutions, defines details of research program and division of work

(new) Working Groups or Workshops of scientists to deal with specifics of research topics

FAO organizes consultations, provides consultancy for program formulation

(new) Network Advisory Committee, 3 persons (coordinator, FAO-REUR, ECA Exec.Com.nominee), reviews networks, suggests establishment and phasing-out of network (topics); meeting with coordinators every 2 years.

#### RESEARCH IMPLEMENTATION

Network Coordination Center, designates the Network Coordinator, looks after implementation of agreed network program in cooperation with

Network Liaison Centers, one for each subnetwork, designates the Liaison Officer, follows-up implementation of research on specific topics

FAO supports the above in coordination and liaison, particularly travel, publication of research results.

(Note: Major problem identified in an evaluation: Financing the attendance of scientists at meetings.)

TABLE 1 Organizational Structure of Several Types of Networks

<u>Membership (Action)</u>	<u>Function</u>	<u>Means Decision- Making</u>	<u>Organizer/ Executive</u>	<u>Example</u>
Scientists	information exchange	meetings, publications	volunteer; prof.society staff	CASAF RF Gen.Eng'g.
Scientists in national institutions	research coordination	coordination meeting & advisory committee	national program and research coordinators	Nile Valley Project
Institutions in regional network	research collaboration	(powerful) advisory committee	international project coordinator	NACA
Countries (national institutions)	research cooperation	network consultations	coordinators and liaison officers	ESCORENA
Countries (NARS programs)	research collaboration	permanent regional committee	executive committee incl. coordinator	PRECODEPA
Countries (scientist-based)	research collaboration	network coordinating committee,	international coordinator (topic/regional)	IBSRAM
Regional Networks	research coordination/linkage	board, techn. committees	director-hq. regional coordinators	INIBAP

Eight Ranked Major Characteristics or Criteria of Networks

(Extracted from: IFARD Report of Meeting 6-11 Oct. 1986, pp. 146-147)

1. The importance of the problem

Strong self-interest in finding solutions. Many existing networks have been originated by donors. There are, however, many problems of regional or group-country importance, often related to non-food commodities, which attract little interest. These are suitable for networking, as they often lack the critical mass of research support which their national significance merits.

2. Problems should be clearly defined and included in national programs

A well-defined problem, even if, or because, it is consigned to the "back-burner", lends itself to collaborative action.

3. Strong and effective coordination

In the examples quoted at the meeting, it appeared that coordination was often vested in an IARC or regional institution. It was generally agreed that NARS should become more and more involved in the coordinating role, if possible, on a rotating basis, as is the case in PRECODEPA. Responsibility for leadership of individual components of the network activities is usually vested semi-permanently (on a continuing basis) in participating centers or organizations having particular strengths in the appropriate field of work, as in PROCISUR. Thus a concept of selective leadership may be defined.

4. Commitment of funds

National commitment to a desired research thrust should at least permit its inclusion in the national program, even at an inadequate level.

5. The availability of flexible outside funding

Some participants viewed this question as one of the most difficult issues to resolve in the whole field of the networking processes, believing that in an ideal situation a network, even though initiated with outside assistance, should become dependent on its members (i.e. self-supporting) as soon as possible. It was noted that PROCISUR was expected to become self-supporting in due course. The strengthening of NARS, particularly of their self-reliance through network activity, was considered a most desirable outcome by many participants.

Given increasing scientific capacity in NARS and, in some cases, improving financial circumstances, the chances of establishing

reliable networks seem to be improving. Donors are frequently sympathetic to NARS requests for seed funds and appeared to be rather more inclined at present to take an interest in collaborative activities.

Two disadvantages to the outside funding of networks were noted. The first is the inability of many donors to guarantee continued financing, even in the medium term, and the second stems from the political associations of donors which could preclude their assistance to a network which might include "undesirable" participants.

6. An effective advisory group

This need is indisputable. That the group should consist of the national leaders of the participating NARS is desirable.

To be successful, a collaborative network must be planned, implemented and maintained by a peer group of participating scientists. The attention of participants was drawn to the utility of networks in finding and developing potential management skills - only through active NARS staff participation can the training and personnel development role of networks be properly realized.

7. A training component

Many existing networks - especially those forming part of the IARC system - have such a component. Indeed, the networks provide the vehicle for the selection of trainees and, when properly conducted, for the subsequent monitoring of their progress. The same applies to some networks conducted by major donors and international agencies. Most networks conducted with adequate provision of external support do carry a training component.

Considering other forms of networking, however, for example PROCISUR, the best way to effect appropriate training was somewhat diverse. The solution found was to build into the network a system of regular staff exchanges, whereby each participating country would be given the opportunity of upgrading its skills in those areas and activities of a joint program, the leadership for which was established elsewhere.

8. The capacity to make a contribution

Possession of research capability and strength is an obvious precondition to membership in a network. While almost any institution can participate as a recipient in a dependent collaborative program, participation in an independent network requires a capacity to contribute. This reinforces the criterion of budgetary provision for research on the subject of the network. A participant should also have scientific competence in at least one aspect of the special research to be undertaken or, at the very least, be prepared to assign scientists for appropriate training.



Characteristics of Collaborative Research Networks

(Extracted from: SPAAR - African Agr. Research Networks, pp. 3-4)

Desirable characteristics of collaborative research networks are as follows:

1. Network developed around subjects that the National Agricultural Research Systems perceive as important. In some cases, scientists of donors and of international research institutions may facilitate in articulating the subject orientation.
2. A well defined common theme or strategy. Research activities undertaken should normally be within the support capabilities of the member states resources.
3. A harmonizing (coordinating) organization to facilitate inter-country activities, provide technical backstopping, and arrange monitoring tours.
4. A steering committee composed of participating scientists from the national agricultural research systems to provide technical leadership and direction to the network.
5. Regular meetings of participating scientists to:
  - identify objectives to be achieved;
  - identify technical problems related to the commodity or problem and place them in priority order;
  - identify specific topics to be studied in all countries and other activities to be undertaken by only one or two countries or an IARC on a regional basis; and
  - decide who will take the lead and which countries or IARC will participate in developing each activity.
6. Information exchange system consisting of a regular newsletter and reproduction of other research reports which are of interest to network member scientists.
7. Free exchange of plant/animal materials among member states and scientists.
8. Education and training opportunities, including regular workshops of scientists to facilitate exchange of research results and discussion of research methodologies, to promote more effective research.
9. Financial support for in-country implementation of planned network research provided by the respective national agricultural research systems. Donors may partially fund the national research programs and/or may fund the harmonizer/coordinator and some other aspects of network coordination.

The Goal and Program Strategy of the CGIAR

(Extracted from: CGIAR Priorities and Future Strategies, 1987)

The definition of the System's long-term goal has evolved towards greater clarity and specificity with the consensus that has emerged in recent years among originally diverse ideas. This consensus is reflected by the goal statement developed by TAC:

Through international agricultural research and related activities, to contribute to increasing sustainable food production in developing countries in such a way that the nutritional level and general economic well-being of low-income people are improved.

The above goal statement specifies and thereby focusses on:

- developing, not developed countries;
- research and related activities, not development or technical-assistance activities;
- international, not national or regional research;
- food and feed, not industrial commodities;
- technologies for long-term sustainable production, not technologies that sacrifice ecological stability for short-term gains in productivity;
- improved nutrition and economic well-being of low-income people, not solely through increased food production, but also through improved food quality, greater equity in distribution, more stable food supplies, and increased purchasing power.

The Key Characteristics of the International-Center Concept

1. Extracted from: CGIAR Priorities and Future Strategies, pp. 28-29.

The key characteristics of the international-Center concept are:

- the global perspective of mandates and program which facilitates a clear focus on problems requiring an international solution;
- the international status of Centers and their governance, staffing, program design and resource support, which protect their mandates and programs from political pressures and from purely national and regional influences;
- the international mobility of germplasm, Center staff and knowledge; and
- the principle of universality, which ensures accessibility of research results to all interested parties and openness of Centers to all partners seeking collaboration.

The operational approach of the CG Centers is characterized by:

- the development at the Centers of a strong scientific basis for research and technology generation, training, and the promotion of linkages with collaborating institutions;
- the clarity of focus and the multidisciplinary approach to solving highly relevant and clearly defined problems in the technological, institutional and policy areas relating to food production;
- the continuity of effort and adequacy of support in scientific research and related activities;
- the ability to attract staff of high quality and strong commitment to the System's goal;
- the institutional flexibility and responsiveness of Centers to evolving needs and opportunities for research; and
- the balance between Center autonomy at the program level and central oversight at the level of system-wide strategic planning and resource allocation.

2. Additional features that are an accepted part of the international-center concept.

An emphasis on timely achievement of needed research results. Increasing output from human resources or improving the quality or impact of that output would often be part of such an emphasis.

Accountability for proper use of funds (and other resources), with mechanisms to ensure such use.

A flow of relevant information that is comprehensive, expeditious and transparent in all parts of the research effort.

An effective control of program priorities and activities.

A growing sense of belonging in a system having a CGIAR identity.