

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
TECHNICAL ADVISORY COMMITTEE

THE FUTURE ROLE OF THE CGIAR
IN DEVELOPMENT OF NATIONAL AGRICULTURAL RESEARCH SYSTEMS:
A STRATEGIC STUDY OF
INSTITUTION STRENGTHENING RESEARCH AND SERVICES

TAC SECRETARIAT
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

April 1996

6535 N.E. Port Drive
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25 August, 1995

Dear Dr. Winkelmann,

It is my pleasure to submit herewith the final version of the report of a panel on "The Future Role of the CGIAR in Development of National Agricultural Research Systems: A Strategic Study of Institution Strengthening Research and Services".

At its 66th meeting, the TAC commissioned a "Stripe Study of Public Policy, Public Management and Institution Strengthening Research/Service", and agreed that this study should be conducted by two panels: one dealing with Public Policy and Public Management, and the other dealing with Institution Strengthening Research/Service. I have the pleasure of chairing the second panel. In this task I am ably supported by four additional panel members: Dr. Stephen Biggs (UK), Dr. Seme Debela (Ethiopia), Dr. Bakary Ouayogode (Côte d'Ivoire), and Dr. Armando Rabuffetti (Uruguay).

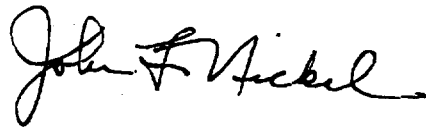
Our panel has met twice: once, together with members of the other panel, TAC members Eugenia Muchnik and Hans Gregersen, Guido Gryseels, and representatives of the IARCs, in a two-day seminar at ISNAR, and, as a panel, on 7-9 June in Rome. At the Rome meeting our panel discussed a rough first draft of our report, compiled from contributions I had received from the other panel members. Based on discussions among ourselves, as well as with key FAO officials and Guido Gryseels, and subsequent communications received from panel members, a second draft was prepared. This draft was sent to the Centres and panel members for comment and was discussed at the 67th meeting of the TAC in Rome on 13 July, 1995. Based on these discussions, as well as a list of questions submitted by the TAC after its closed session discussion of the draft, as well as comments received from the Centres and panel members, this final version of our panel's report has been prepared. I understand that this will now be sent to NARS representatives for discussion at their meeting at ICW 95, and that their comments on it will be appended to this report when it is taken up by the TAC at its 68th meeting in December, 1995.

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Dr. Donald L. Winkelmann
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Technical Advisory Committee (TAC)
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On behalf of the other panel members and myself, I wish to express our deep appreciation to the TAC for entrusting us with the responsibilities for this study, and to the TAC Secretariat for the excellent support we received in all stages of it. It is our sincere wish that this report will contribute positively to the CGIAR, its component Centres, and the TAC as they continue to develop this very important set of activities.

Respectfully,

A handwritten signature in black ink, appearing to read "John L. Nickel". The signature is fluid and cursive, with a long horizontal stroke at the end.

John L. Nickel
Panel Chair

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EXECUTIVE SUMMARY

1. The TAC has commissioned a 'Strategic Study of Public Policy, Public Management and Institution Strengthening Research/Service in the CGIAR'. This is the report of the five-person panel¹ charged with the Institution Strengthening Research/Service component of the Study.
2. This study is timely in that it comes in the midst of an 18-month period of 'renewal' of the CGIAR. A key aspect of this renewal process is that it envisages a greater role of national agricultural research systems (NARS) as full partners in the CGIAR, for which a NARS Working Group is developing an 'Action Plan'. The NARS are seen as playing an important role in both the setting and implementation of the CGIAR research agenda. To play this role, it is important that the NARS be strong; greater involvement in the CGIAR system, will in itself contribute to their strength. The purpose of this study is to analyze ways in which the Centres that constitute the CGIAR System can best contribute to the strengthening process.
3. The study begins with a consideration of the 'outputs' of strengthening efforts, i.e. what is the objective of activities ('inputs') aimed at strengthening NARS. In doing so, a NARS has been defined broadly as "a system comprising all of a country's entities responsible for organizing, coordinating or executing research that contributes directly to the development of its agriculture and the maintenance of its natural resource base." The steps in the process of development and execution of agricultural research in NARS are summarized as:
 - Agricultural Research Policy Formulation
 - Constraints/Potential Identification
 - Research Program Development
 - Resource Allocation
 - Research Program Execution
 - Monitoring and Evaluation

A strong NARS is defined as one that carries out all of these steps effectively and efficiently in a sustainable manner in a changing environment. The major internal and external actors involved in each of these steps are identified.

4. NARS, and individual components of NARS, vary greatly in the degree of strength or weakness. In order to assist NARS, and those organizations working with them, to

¹ The Institution Strengthening Research/Service Panel is composed of: John L. Nickel (USA), Chair, Stephen Biggs (U.K.), Seme Debela (Ethiopia), Bakary Ouayogode (Côte d'Ivoire) and Armando Rabuffetti (Uruguay).

better identify which areas most need strengthening, and what inputs are required to achieve this objective, descriptions of the characteristics of strength and indicators of weakness for each of the key factors are given. This analysis has been made at three levels: National Agricultural Research System (NARS), National Agricultural Research Institute (NARI) and Agricultural Research Centres and Stations (ARCS). The criteria for involvement and roles of various external actors are indicated for each of the strengthening functions as they relate to institution building, technical support, and research cooperation.

5. The past and current inputs of the CGIAR Centres to the strengthening of NARS summarized as follows:

- Institution-strengthening has been an important component of the Centres since the first Centre was created, and continues to be a major activity of all Centres. Until the creation of ISNAR, however, the impact of these activities has largely been to those components of the NARS related to the specific mandates of the respective Centres, not to the NARS as a whole. The fact that these components of NARS frequently operated in a relatively weak institutional environment tended to lessen the impact of the strengthening activities. This realisation was an important consideration in the rationale for the creation of ISNAR. It has also been noted that the support from the Centres was often more supply than demand driven.
- ISNAR began chiefly as a service organization, devoting much of its resources to diagnostic studies. It has progressively moved towards greater attention to research and development (R & D) activities. Concomitant to this has been a broadening of its disciplinary coverage to include more staff with training and experience in the socio-economic and management sciences.
- As the respective components of the NARS have become stronger, and the Centres have move 'upstream' in their research, there has been a gradual shift away from more general production courses to specialised, individual training. Much of the former types of training is now conducted in and by the NARS, or in regional collaborative networks. To help in this endeavour, many of the Centres are now engaged in 'training of trainer' and courseware development activities.
- As the former 'commodity-oriented' Centres have progressively incorporated more research on natural resource and environmental issues, the distinction between the commodity-oriented and natural resources Centres has become more blurred.
- There is very little overlap between the institution strengthening activities of ISNAR and IFPRI. Such overlap as exists is chiefly in the area of government policies on funding of research; an area in which there is growing collaboration between the two Centres.

- The combination of financial shortfalls with a growing capacity of NARS to do their own training and manage their networks, has led to a gradual decline in the allocation by Centres of budgetary resources to institution-strengthening activities, but they remain substantial. Using the TAC classification of activities, the budget allocations for the category "Fortifying NARS" represents 17% of the combined 1996 funding allocations (down from 24% in 1991). This is composed of training (7%), information and communications (6%), organization and management counselling (2%), and networks (2%).

6. With regard to future directions for the CGIAR in institution strengthening, the panel makes the following observations and suggestions:

- There is an urgent need to conduct more research on institutional development, particularly as it concerns agricultural research in developing countries. It will be necessary to develop indicators for assessing institutional development requirements, evaluating which types of interventions have achieved the best results, and identifying the political, cultural and institutional factors that have led to failure, and how to overcome such constraints. To do this the orbit of actors involved in such studies needs to be enlarged to include universities and other institutions that have expertise in the field of political, social and management science. Within the CGIAR, ISNAR should play the key role in such studies and linkages. The panel endorses ISNAR's progressive shift from services towards the R & D end of the spectrum of its activities; this trend should be continued and accelerated.
- As part of R & D, ISNAR (and other Centres in collaboration with ISNAR) should develop and disseminate generic, methodological tools for research organization and management. These tools represent international public goods. The use of such tools (appropriately modified to take into account the heterogeneity of NARS) by other organizations in assisting NARS will make it possible for ISNAR to reduce its service activities.
- The emergence of regional groupings of NARS is seen as a potentially positive development that can help facilitate and channel the Centres' efforts in institution-strengthening. The CGIAR needs to explore how it can assist in the strengthening of such regional groupings to make them truly effective.
- There appears to be a need for closer collaboration among Centres, and particularly between the other Centres and ISNAR, in institution-strengthening activities.
- Each Centre should develop a monitorable policy regarding the effects of its overall activities on the institutional development of research capabilities.

- The CGIAR should be seen as a relatively small, but key, component of the global research system, and expand its linkages to other institutions involved in related activities. Its abilities to forge such linkages, as well as linkages with and among NARS, will be facilitated by the dynamic developments in international information and communication facilities.

THE FUTURE ROLE OF THE CGIAR IN DEVELOPMENT OF NATIONAL AGRICULTURAL RESEARCH SYSTEMS: A STRATEGIC STUDY OF INSTITUTION STRENGTHENING RESEARCH AND SERVICES

I. BACKGROUND

A. INTRODUCTION

1. This review of the institutional development of agricultural research concentrates on strategic issues and takes a forward looking approach to the role the organizations in the CGIAR system might play, along with others in the Global Agricultural Research System (GARS) in strengthening National Agricultural Research Systems (NARS) in developing countries. It comes at a critical time in the history of the CGIAR: when this successful consortium is in a period of renewal; and when the Ministerial-Level meeting at Lucerne (CGIAR 1995) has ascribed a stronger role for the NARS, in both in the **setting** and **implementation** of the CGIAR research agenda.

2. There is no doubt that in order to play these larger roles the NARS will need to be strong. Indeed, one of the five components of the "Research Agenda" of the LUCERNE ACTION PLAN is "contributing to strengthening agricultural research in developing countries." The question that arises, however, is what is to be the role of the new CGIAR in this strengthening endeavour. At the Lucerne meeting, views on this subject were divided; while some saw this as an important function for the CGIAR, others suggested this responsibility should be assumed by other organizations. It was pointed out that in order for the CGIAR Centres¹ to increase work on natural resources and social science there has been a proportionate decline in expenditures on capacity building. It was further asserted that strong national research systems are essential for the CGIAR to move upstream and tackle more strategic problems; and the question was raised "Who is going to build that research capacity?" To help resolve this conundrum this study was commissioned by the TAC.

3. This study is one of two components of a larger "Stripe² Study of Public Policy, Public Management and Institution Strengthening Research/Service". The draft terms of reference for this study (as presented to TAC 66 at Lima) are appended to this report as Annex A. At the Lima meeting the TAC decided that the study should be conducted by two panels: one dealing with Public Policy and Public Management, and one dealing with Institution Strengthening Research/Service. This report is of the second panel. The major questions the TAC asked the two study panels to address are:

- What are the centres doing and how is it done?
- Are there better ways of doing it and what are the options available?

1 The word 'Centres', used interchangeably with the acronym, IARCs, in this document, refers to all of the centres and institutes supported through the CGIAR.

2 A 'stripe study' in the CGIAR terminology, refers to a study on a particular subject across all of the Centres in the CGIAR System.

- Are there gaps in the current CGIAR portfolio and/or are there activities to be deleted from that portfolio?

4. With respect to the Institution Strengthening Research/Service component of the study, the TAC asked our panel to address the following questions:

- How much and what type of this work should the CGIAR System vs others be doing (what are others doing)?³
- What are the advantages of this type of work being done in international organizations?
- Are there international public goods characteristics?
- If the CGIAR System should be continuing to do it, how should it be organized?
- Should ISNAR have a more central role, or is much of this kind of work, e.g. related to training and capacity building, done better in a decentralized fashion, or in connection with systemwide ecoregionally focused programmes?
- Is the current balance optimum, or should it be changed?
- How should the System link to and coordinate with others involved in this type of activity?
- How should priorities for this type of work be established (e.g., small countries vs. high population countries)?

5. The study began with a two-day seminar at ISNAR, attended by two TAC members (Eugenia Muchnik and Hans Gregersen), Guido Gryseels (Officer-in-Charge of the TAC Secretariat and the TAC Secretariat resource person for the study), representatives of the Centres, and the ten members of the two panels. The schedule of that Seminar and a list of the participants are appended as Annex B. Panel members returned to their homes to write on specific areas agreed upon at the Seminar. The chair of this panel stayed on for two additional days of discussions with ISNAR staff and was responsible for putting together the first draft of this report, incorporating contributions from the respective panel members. At the same time a questionnaire was sent to each Centre to obtain information on current and planned NARS strengthening activities. This panel met again in Rome on 7-9 June, 1995. At that meeting the panel discussed the first draft and responses from the Centres to the questionnaire, and met with key FAO officials. On the basis of these discussions, a second draft was prepared. This was sent to the Centres and TAC members. The Chair of the panel met with the TAC at its July meeting. On the basis of discussions at that meeting, a list of questions posed by TAC members, and responses from several Centres, this final version of the report was

3 This study did not have the resources to learn what others are doing, as this would entail a major international survey of at least major public and private research institutions in the world. Perhaps the TAC will need to commission such a study.

prepared. It is being sent to the NARS working group⁴ for discussion at their meeting scheduled for ICW 1995 in Washington. Their comments are invited, and will be appended to this report when it is considered by the TAC at its meeting scheduled for December, 1995.

6. We have not been asked or given the resources to undertake a comprehensive review. Consequently, some of the analysis is speculative. However, we hope that this report will be of use to the many actors that influence science and technology policy in the CGIAR system and in NARS.

B. THE CHANGING NATURE OF THE GLOBAL AGRICULTURAL SCIENCE AND TECHNOLOGY SYSTEM

7. Since the establishment of the IARCs in the early 1960s, there have been many changes in their number, their level and pattern of funding, their scientific emphases, and their relationships with the NARS. At the same time there have been major changes in the size and organization of NARS in both low and high income countries. Some of these trends have been documented; for example, by Pardey et al (1991). In addition, there have been major changes in the way actors who influence science and technology policy perceive the nature of institutional development. We outline these trends here, as they provide part of the basis for our concluding suggestions.

1. Evolution of The CGIAR System

8. A detailed history of the development of the CGIAR from 1960 to 1985 is given in Baum (1986). Since that time, several other Centres dealing chiefly with natural resources issues (CIFOR, ICRAF and IIMI), as well as INIBAP (dealing with banana and plantain research) have been added to the system, the former IBPGR has been reconstituted as IPGRI, and ILRAD and ILCA have been merged to form ILRI. Recently the mode of action of the Centres has also changed by the addition of the concept of Systemwide and Ecoregional activities.

9. The CGIAR is currently in the midst of an 18-month "Renewal" process. The programme of renewal was initiated at the Mid-Term Meeting in Delhi in May, 1994, continued at the Mid-Term Meeting in Nairobi in May, 1995, at which detailed changes and instruments were adopted, and is expected to be finalized at International Centres Week in Washington in October, 1995, when the final adoption of new structures, programmes, and procedures will take place, with the goal of having a renewed CGIAR in place in January, 1996. Key element of the renewal plan that are particularly relevant to the subject of this study are:

- greater involvement of the NARS as full partners in the CGIAR, for which an Action Plan is being developed by a NARS Working Group; and

4 The NARS Working Group is made up of NARS representatives to the CGIAR and other members that met at the Nairobi MTM as a follow-up to the NARS Consultation held at Rome on 12-14 December, 1994, and the Ministerial-level Meeting at Lucerne, and is charged with developing an Action Plan to strengthen the NARS-CGIAR partnership.

- a matrix framework made up of Centre programmes, and systemwide programmes in specific areas of research that involve both the Centres and other actors in the execution of the research; with donors being given the option of providing support to individual Centres and/or to systemwide programmes.
- a commitment of the CGIAR System to the goals of poverty alleviation and environmental protection.

The CGIAR renewal process and the NARS Action Plan will reinforce trends to a) convert the nature of cooperation between Centres and NARS from supplementary to complementary, b) change the relationship between respective institutions from dependency to interdependency, c) alter the basis of communication from passive consultations to joint decision-making, and d) modify the organizational framework for interinstitutional cooperation from vertical supplementation to horizontal complementarity.

2. The Changing Perception of What Constitutes NARS

10. The concept of the NARS of the developing countries has undoubtedly changed over time, especially in the past 10 years. When a single institution was responsible for the public sector agricultural research, such institutions have been referred to as National Research Institutes (NARIs). In most cases the links of the NARIs with other national institutions with potential research capacity, especially the universities, was very weak or non-existent. The improvement of the scientific and technological capacity NARI researchers was mostly accomplished by postgraduate education at the Agricultural Colleges of the U.S. and Europe, generally under the financial support of international cooperating agencies. Also training (mainly in-service training) at CGIAR Centres was a frequent feature. In some cases the developing countries conducted their own graduate programmes. The essential feature, however was that the Colleges of Agronomy and Veterinary Sciences of the national universities of the developing countries were usually not conceived as being as recipients of funds in support of agricultural research. One reason for this in some regions may be because by the 1960's and 1970's many of these universities were facing serious problems not only caused as a result of serious financial problems, but also because of their involvement in social and political turmoil. The net result of this situation has been an overall lack of adequate articulation and linkage between the NARIs and the Universities.

11. Also the relationships of the NARIs to private sectors and other organizations related to the generation and transfer of technology, was generally poor. Often in the past the key role of non-government and non-CGIAR actors was not emphasised (for example, see Tender, 1993). This situation has been improving during the past decade. Yet, such research partnerships that have developed outside the public-sector institutions are few and recent.

12. Several factors have been operating in the last years that point to a need to visualize the NARS with a much broader perception than in the past.

- a) The increased interconnection and interdependence of the so called "basic", "strategic", "applied", and "adaptive" research for the generation and application of new technologies in agricultural production implies that a need for much closer coordination of activities among the public and private agricultural research and extension organizations of a given country. Biotechnology is a clear case for such closer integration, as it is significantly changing the scientific and institutional basis of the process of agricultural technology generation and transfer. In addition to the research in this field done by NARIs and agricultural faculties in universities, some work on biotechnology is being done by universities with no previous experience in agriculture. Also biotechnology requires scientific talents different from those available at the traditional agricultural research institutions.
- b) In many countries public funding of agricultural research has decreased, especially in terms of funding per scientist; at the same time there has been an increase in the participation of the private sector in research and development activities in many developing countries. For example:
 - (1) Areas of research like agrochemical and fertilizer evaluation have been taken up by private organizations related to the production and marketing of these products.
 - (2) Breeding for the creation of new varieties has been increasingly done by multinational firms, enhanced by an increase in property rights for created materials. In this area the relationship of biotechnology with the private sector is an example. Even though universities are playing an important role in biotechnology research, the development of biotechnology both in developed and developing countries is characterized by market incentives and private investments.
 - (3) Producer organization involvement in the adaptation and dissemination of technology has become significant in the past 15 to 20 years. In some cases producers have virtually assumed the role of the public extension system through the development of their own technical assistance mechanisms.
 - (4) The development of research foundations is another feature to take into consideration (especially in Latin America). Regardless of whether they perform research and development activities themselves, or they are only restricted to the funding of research, the foundations are important because they increase the country's research capability and the research support base.
 - (5) There has been an increase in NGO activity in agricultural research and extension (see Farrington, et. al., 1993), but this is still quite limited with respect to research.

- (6) Farmers themselves have been increasingly recognized as experimenters in the generation and evaluation of production technology. This has been accompanied by a growing trend towards farmer participation in the research planning and execution process.
- c) A number of regional groupings of NARS have been added or strengthened. These are discussed more fully in the "Future Directions" section of this report (see paras 57 and 58).
- d) The need to protect the environment and the natural resource base are becoming a growing component of the research agenda of developing countries. This has also expanded the spectrum of national entities which have to be considered as part of a NARS. A significant proportion of the research dealing with natural resource management and conservation is being conducted at institutions like universities or programmes of the ministries of Agriculture distinct from the NARIs themselves.

13. It therefore appears more appropriate for the CGIAR to conceptualize the NARS as "a system comprising all country's entities responsible for organizing, coordinating or executing research that contributes directly to the development of its agriculture and the maintenance of its natural resource base" (ISNAR,1992). In such a national system, the various entities responsible for research operate at different levels and fulfil different functions. At the research policy level, for example, Agricultural Research Councils or Boards may formulate policies and coordinate the activities of other entities without themselves executing research. At the operational level, the institutes which conduct research and develop technologies are diverse. They can be of public, private or mixed character. They range from ministerial departments and national research institutes and universities, to quasi-private institutes such as non governmental organizations (NGOs) and research foundations to fully private ventures. And their mandates vary in scope from research focused on single commodities to research on all relevant crops, livestock, forestry and fisheries within a country or an agroecological zone. It should also be noted that a country's NARS is not a hierarchical system or organization operating under a single line of command.

14. Because of the different political, economic, scientific and institutional environment of such a system, as compared with the single NARI, it is timely to critically re-examine and re-design the CGIAR strategy in terms of its future approach to and relationships with NARS. The involvement of the CGIAR in activities aimed to strengthen the NARS of developing countries should take a holistic approach, not only when considering the critical areas of intervention at a NARS level, but also when defining how, and through which Centre the CGIAR will be involved in those actions.

3. Contending Coalitions of Agricultural Science and Technology

15. A major change of recent years is that the activities of agricultural research organizations, whether international or national, are now widely viewed as taking place within the broader political arena occupied by government, non government and private organizations generally. The relations between these organizations may be

complimentary, competitive or symbiotic, depending on the particular set of circumstances. The boundaries between "international" and "national" research are seen in practice to be very blurred. The two can also be highly interactive, and an international Centre can profoundly affect the strength and capacity of national organizations. The promoters and funders of IRRI, for example, also exerted a major influence on rice research policy and the long term scientific rice research capability in India and other Asian countries (Chandler, 1979; Anderson, 1991). The IRRI coalition gave rise to a strengthening of research capability on dwarf varieties and a relative weakening of work on other germplasm. There are various views about the rationale and long term effects of these initiatives but this is not the place to review the arguments. For our purposes, the point is that research funding, technology priority setting and institutional capability development are increasingly seen as taking place in political arenas. It follows that there is no simple apolitical notion of scientific "institutional development", "institution building", or "institutional strengthening". There are always contending coalitions actively promoting one sort of science and technology rather than another.

16. Related to this change of view has been the recognition that NGOs can and do play an advocacy and policy role in the international and national arenas of science. There is a slight paradox in this recent acknowledgement, given that NGOs such as the Ford and Rockefeller Foundations have played major roles in influencing the direction, pace and content of international and national agricultural science for many years. The very high level of involvement of the Ford Foundation in influencing science and institutional development policy is well described by Staples (1992) in his review of 40 years of Ford Foundation activities in India. The influence of the Rockefeller Foundation is described by Lele and Goldsmith (1986). In addition to such international organizations, local NGOs play an important role in advocating greater attention to environmental and equity issues.

17. The CGIAR is one coalition in this global system. It has been noted that it represents only three to four percent⁵ of the total agricultural research efforts, but plays an important catalytic role. The challenge for the renewed CGIAR will be to see how this relatively small amount can be used to its maximum effect for reducing poverty and protecting the environment in the global agricultural system. The partnerships developed between individual Centre programmes and the respective programmes in NARS represent another coalition, sometimes referred to as an "invisible college" of those who have been trained at the Centres and continue their relationships through follow-up activities and collaborative research. While such coalitions are on the whole a positive development, care must always be taken to ensure that these close, collegial relationships do not distort national priorities or divide loyalties. As Centres have moved into more strategic research, "upstream" coalitions are also being developed in between them and advanced institutions in areas of highly specialized research. These coalitions can serve as an important bridge to bring benefits of new knowledge and methods to bear on the research problems being addressed by the NARS.

5 Statement by I. Serageldin, at Lucerne meeting (page 79, CGIAR, 1995).

4. A Broader Perspective on Institutional Development

18. Another change is that organizations such as ISNAR are altering the emphasis of their advice to research managers. In the past, much institutional development was structural in its approach. It was concerned with the reorganization of national agricultural organizations, the establishment of farming systems research units, and so on. This has now changed to take on more directly a broader set of issues. In a recent ISNAR publication, Busch and Bingen (1994) suggest a "multiframe" approach consisting of three Perspectives: Structural, Human Resource, and Political. The latter is concerned with the bargaining, coalition building and politicking that research managers in all scientific systems undertake. Clearly, the various institutions making up a NARS must become more accountable to their stakeholders, and need to engage in public relations efforts to make policy-makers more aware of their work.

II. CONCEPTUAL FRAMEWORK FOR A CGIAR STRATEGY TO STRENGTHEN NARS

19. The conceptual framework used for this study is to view the various strengthening efforts as "inputs". Before reviewing the current and past inputs, and considering what the future role of the CGIAR might be in this arena, it is essential to define what should be the "output" of such efforts. This means addressing first the questions of what "strong" means, and which elements of such strength are most important for NARS to be most effective.

A. WHAT IS MEANT BY "STRENGTHENING" OF NARS

20. Throughout the history of the CGIAR there has been a strong emphasis on the need to strengthen NARS. Indeed, in the broader field of agricultural development, there have been numerous projects fostering institutional development. Many bilateral and multilateral development organizations, and international NGOs (e.g. the World Bank, FAO, UNDP, CIDA, ODA, USAID, EEC, and the Ford and Rockefeller foundations) have provided assistance in institutional development, especially in the areas of infrastructure and human resources development. These concerns and efforts implied that NARS were "weak" and needed "strengthening". Obviously some NARS, as well as individual components of each, are stronger than others. Thus, as a strategy is developed for the inputs that the CGIAR as whole, and each Centre, should provide, it will be necessary to identify those areas in which NARS, in general, and those NARS with which the individual Centres are partners, to achieve the desired outputs. In order to do this, the broad subject of "strengthening" needs to be clarified and de-aggregated. First, a broad description of the processes involved in development and execution of national research programmes will be described, then indicators of strength and weakness for each of the factors involved in this process will be defined.

21. For purposes of this study, a strong research system is one that has the sustained capability to effectively and efficiently execute that is of the highest priority in relation to national policies and farmers' needs, and respond dynamically to changing internal and external information. In the context of the stated goals of the CGIAR System, such

research should specifically address the issues of poverty alleviation and the protection of the environment.

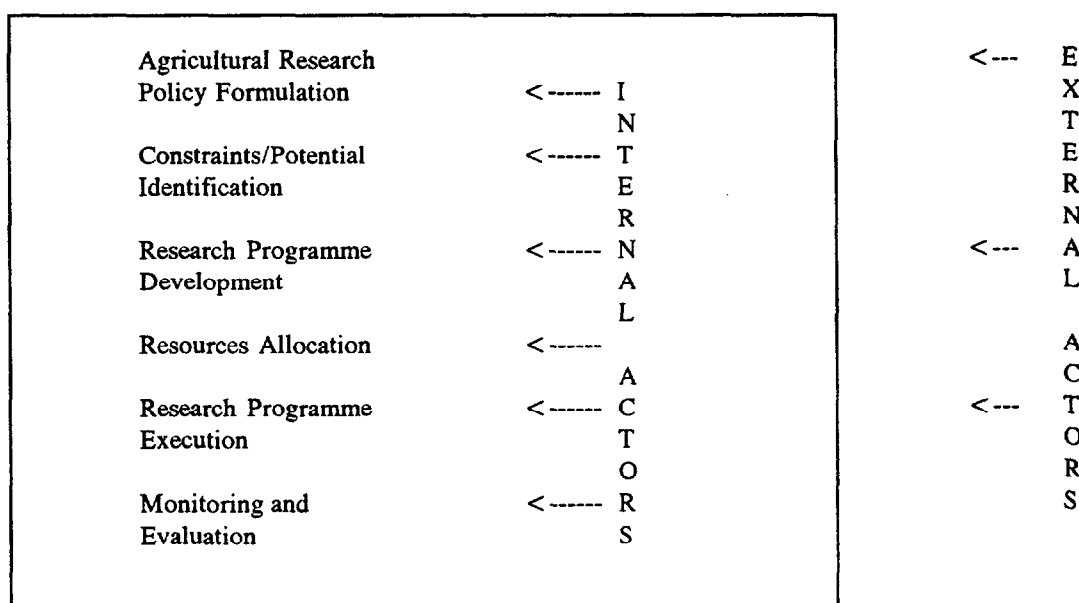
1. Processes Involved

22. The formulation of a strategy of assistance to strengthen NARS of developing countries can best be viewed from the standpoint of processes involved in the development and execution of national research programmes and the delivery of research results to stakeholders. A summary of the various steps in such a process can be schematically represented as shown in Figure 1.

23. The development of national research programmes aimed at meeting technological needs must start with a well formulated national agricultural research policy. Such a policy must ideally be a product of a properly targeted national development plan, which should also include agricultural development as an integral component. Ideally, such a plan should include a clear ranking of priorities for various commodities and regions.

24. The availability of a national agricultural research policy should enhance the identification and prioritization of potentials/constraints to agricultural production/productivity. This should follow a holistic approach by dealing not only with production but also with conserving, and possibly enhancing, the natural resources base of the country. The translation of an agricultural research policy into a prioritized research plan should take into account whether or not the potentials/constraints are amenable to solution by research, and what technology is available elsewhere. The priorities should not only be with respect to commodities, but also with non-commodity specific research areas, such as soils and water research.

Figure 1: A Schematic Representation of the Steps Involved in the Development and Execution of Agricultural Research in National Agricultural Research Systems (NARS)



25. The identification and prioritization of potentials/constraints in agricultural production/productivity should lead to the formulation of national research programmes, which are made up of specific research projects aimed at identifying solutions to specific limiting factors to production and dissemination.

26. The next step in the process deals with resource allocation. The crucial issues in this step relate to the amount, quality and timely availability of the necessary human, material and financial resources for research. Meeting these preconditions leads to the next step in the process, i.e. the execution of research projects, the end result of which are technologies and production systems custom-tailored to the needs of farmers and agroindustries. This requires a strong socio-economics capability.

27. Finally, the logical concluding step in the process is the monitoring and evaluation of the research effort. The two crucial issues in this regard are: 1) the assessment of performance of the national research system per se in relation to the quantity and quality of products it generated as per its plan of action and, 2) the evaluation of impact of its research productions on the national agricultural output, both from quantity and quality perspectives. The former issue (i.e., performance) measures the efficiency and effectiveness of the research system itself, while the latter issue (i.e., impact) is influenced by a myriad of factors, many of which are beyond the direct control of the research system. Both are difficult to assess.

28. The implementation of the various steps in the process described should follow a "participatory" approach in which major stakeholders play an appropriate role. This calls for linkages with various actors, both from within (internal) and outside (external) the country (see Table 1).

Table 1: Objectives and Major Players in the Various States of the Research Development and Execution Process in NARS

STEPS	OBJECTIVES	MAJOR INTERNAL ACTORS	MAJOR EXTERNAL ACTORS
Agricultural Research Policy and Strategy Formulation	To align research objectives with national development policies	High level policymakers, extension leaders, NGOs, farmer organizations, Agroindustries	Bilateral & multilateral scientific & development agencies; CGIAR Centres; NGOs; Transnational companies, WTO
Identification of Constraints and Potentials	To identify and prioritize researchable issues	Researchers, farmers, extension workers, NGOs, agroindustries	CGIAR Centres, Non-CGIAR Research and Technology Institutions
Research Programme Development	To define research protocols & identify resource requirements	Researchers, extension workers, farmers, NGOs, agroindustries	CGIAR Centres, Non-CGIAR Research and Technology Institutions
Resources Allocation	To ensure adequate and timely availability of resources	High level decision makers, Research managers, researchers	Bilateral & multilateral scientific & development agencies;
Research Programme Execution	To generate technology and management systems	Researchers, farmers, NGOs	CGIAR Centres, Non-CGIAR Research and Technology Institutions
Monitoring and Evaluation	To assess performance and impact	Research leaders, researchers, Extension leaders	Bilateral & multilateral scientific & development agencies; CGIAR Centres

29. The main internal actors include policymakers at various levels (including research institute managers and university authorities), researchers, extension workers, farmers, non-government organizations (NGOs) engaged in agricultural research and/or development (including private sector research) activities, and industries dealing with seed production, food/feed processing and agricultural inputs supply. On the external side, the major elements in the linkage matrix include bilateral organizations, multilateral organizations, CGIAR Centres, non-CGIAR research Centres and other organizations such as universities and private sector research and development organizations (e.g. seed and agrochemical companies).

2. Defining Strength and Weakness

30. Tables 2-4, below, break these processes down into various factors for each of three organizational levels (national system, national institution, and individual research station or centre). A number of factors are listed at each level, with indications of the characteristics of strength and the related indicators of weakness described for each function. It should be noted that many of the blocks are inter-related, in that the consequences of weakness in one block often become the source of weakness in another. Analyzed in this way, few, if any, NARS, whether in developed or developing nations, would be able to assert that they are strong in all areas.

31. While this analysis is helpful in assessing strengths and weaknesses of various factors in the components of the NARS, it must be kept in mind that the breakdown of components relates chiefly to the classical structure of public institutions. A more current analysis would also take into account the broader definition of NARS as incorporating universities, private sector research entities, and institutions dealing with natural resource management. It must also be recognized that this, somewhat simplified, model for purpose of this analysis should not be taken as a prescription of a "one size fits all" model. When applying it to individual NARS, a more flexible approach must be taken, in which the cultural and institutional history and environment are taken into account. It is also understood that the decision-making levels vary from NARS to NARS, and are often not exactly as indicated in the tables. Thus, the chief value of this analysis should be seen as illustrative; not as a rigid template against which the strength or weakness of a specific NARS or agricultural research organization can be measured.

Table 2: Characteristics of Strength and Indicators of Weakness of Various Factors in National Agricultural Research Systems (NARS)

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Policy and Infrastructure Environment	Food and input price policies, rural development policies, and marketing and input infrastructure create an enabling environment for uptake of improved technology	Low rates of adoption of technological innovations
Linkages Between Research Leaders and High-level Decision Makers	Good two-way communication on national policies and benefits and needs of research enable mobilization of financial and political support for agricultural research	Inappropriate policies and lack of sustained support for agricultural research
Funding of Agricultural Research	Agricultural research seen as a good investment of public and private funds, with long-term stability of funding at levels commensurate with accepted standards and proportionate to development budgets	Agricultural research institutions underfunded and vulnerable to extreme funding fluctuations; development projects fail to achieve goals for lack of adequate production technology
Agricultural Research Priorities	Priorities for agricultural research clear, ranked, established on sound methods and related to national development policies	Research activities dispersed over too many commodities and not related to national policies, resulting in low pay-off to research investment and lack of credibility of research in eyes of decision-makers
Natural Resource Management Policies	Clearly elucidated policies for land use and conservation and rational utilization of soil, water, forests and genetic resources	Non-sustainable development
Coordination of Agricultural Research	National agricultural research councils ensure that the various public and private institutions work in close collaboration with a clear division of labour	Public funding and facilities for research poorly utilized due to duplication of efforts

Table 3: Characteristics of Strength and Indicators of Weakness of Various Factors in National Agricultural Research Institutions (NARIs)

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Status and Governance	NARI established as a (semi) autonomous body with a governing body that incorporates key stakeholders and with authority to set the institute's procedures for procurement and personnel management.	Excessive political influence on research system, especially in relation to key appointments; excessive delays in procurement; adherence to civil service-type personnel policies that do not reward performance and protect non-productive staff.
Organizational Structure	Structure of NARI management, research programmes and stations, and support services facilitate a good two-way flow of information, delegation of authority, and a collegial environment.	Overly-centralized, hierarchical management of resources; low morale and productivity of researchers; poor communication between headquarters and stations and among disciplines.
Priority Setting	Clear priorities set for commodities and research areas using appropriate methods and incorporating top-down signals from the national priorities and bottom-up signals from stations, extensionists and farmers.	Lack of congruence between NARI priorities and national priorities and farmers' needs; funds poorly allocated; limited resources dispersed among too many research programmes.
Institution Planning	Long-term plan developed that clearly elucidates the mission of the NARI in relation to national goals and spells out human, financial and infrastructure needs, and organizational structure to accomplish these objectives.	Lack of programme planning or planning done in a vacuum, resulting in research activities that reflect the interests of individual researchers and react to donor pressures without a clear relationship to the goals of the NARI and are unrelated to available resources.

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Programme Planning	Annual work plans developed in relation to established priorities, with clear objectives and measurable performance indicators; plans developed in proactive manner involving top management, researchers, and extensionists, and reflecting the needs of the producers.	<i>Adhoc</i> development of research agendas; effectiveness of programmes cannot be adequately evaluated; resource allocation does not reflect national goals or farmers' needs; excessive dependence on externally-funded projects for equipment and vehicles.
Programme Budgeting	Realistic budgets developed by programme leaders, based on programme plans and likelihood of available resources; resource mix provides for adequate operational costs.	More research activities planned than can be adequately supported; too high a proportion of funds for fixed personnel costs; budgets cannot serve as effective control mechanism.
Resource Allocation	Financial, human and equipment resources allocated on basis of programme budgets, and dispersed in a timely and transparent manner.	Resources allocated by region or station on basis of previous years' budgets; budget allocation provided at irregular intervals, and often reduced; centralized control of allocated funds leave researchers in dark as to how much they will have to carry out their work.
Programme Monitoring and Evaluation	Programme leaders monitor progress based on programme plans and coach researchers to improve performance; regular peer review to assess past performance of programmes as well as future plans.	Programme evaluation focuses chiefly on appraisal of new proposals rather than past performance; reviews of previous research concentrates on inputs and activities rather than outcomes.

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Human Resources Management	Recruitment of personnel based on a human resources needs assessment related to the long-term plan and clear job descriptions, and done in a transparent manner, based on objective criteria.	Disciplinary mix in research cadre does not reflect programme needs; top management and research leaders selected on basis of political or other influence rather than past management performance or leadership skills.
	Regular personnel evaluation based on individual performance plans, and done in an objective manner that provides opportunities for positive and negative feedback.	Inefficient and ineffective performance; promotion based on seniority rather than performance; lack of motivation when outstanding performance is not rewarded and poor performance not punished.
	Top management and programme leaders possess leadership skills that motivate staff to higher levels of excellence.	Low levels of research productivity.
Numbers and Location of Research Stations	Research stations located in key agroecological zones, attractive to researchers and their families, and few enough to permit a critical mass of scientists and support in each; research that requires highly specialized skills and equipment centralized.	Excessive fractionation of resources to too many locations resulting in inefficient use of resources and inadequate coaching of junior scientists and interdisciplinary cooperation; sometimes key zones not covered; unattractive duty station.

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Linkages	Strong, collaborative linkages between NARI and universities, extension agencies, NGOs and private sector research; between crop, animal, and forestry research; and with other bodies dealing with natural resources issues.	Inefficient transfer of technology; inefficient use of resources (especially the highly qualified scientists and specialized facilities in universities); duplication of efforts; inappropriate technology in relation to farmers' needs and natural resources concerns.
	Good external linkages with national and international institutions as sources of knowledge.	Ineffective research owing to failure to build on knowledge available; inefficiencies due to duplication of work done elsewhere.
	Effective communication with policymakers utilizes the knowledge and competence of research leaders in setting national priorities and policies, as well as ensures long-term sustainability of funding.	Underfunding resulting from lack of appreciation by policymakers of work of the NARI; National policies and priorities made without benefit of informed input from NARI leaders; policy environment not conducive to adoption of technological innovations.

Table 4: Characteristics of Strength and Indicators of Weakness of Various Factors in Research Centres and Stations (NARC)

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Priority Setting	Clear priorities for research on various commodities and research areas based on NARI priorities, diagnostic studies of local farming systems, and problem identification with inputs from extensionists and farmers.	Research activities do not reflect institution priorities nor respond to production constraints of farmers; inefficient use of resources.
Project Planning	Projects developed on basis of NARCs' priorities, with emphasis on multidisciplinary and interinstitutional cooperation; clear indication of the role to be played by each team member and the experiments to be conducted, and expected outcomes.	Isolated, <i>ad hoc</i> experiments conducted by individual researchers; inefficient use of funds and facilities.
Project Budgeting	Realistic budgets developed by project leaders, that clearly estimate the researcher time allocated to, and resources needed, for each experiment.	Lack of clarity about the resource requirements; managers unable to assess the resource needs in approving projects, nor analyse resource allocation to each commodity and research area in relation to established priorities.
Project Execution	Appropriate mix of biological, physical, and socio-economic research; and of laboratory, on-station, and on-farm evaluation and on-farm validation, with appropriate participation of extensionists and farmers.	Technology developed is inappropriate to the physical and socioeconomic realities of farmers, resulting in poor adoption rates and erosion of credibility of research system in eyes of farmers.

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Project Monitoring and Evaluation	Project leaders monitor progress and coach researchers; regular peer reviews of past research results and future plans, with active participation of extension, NGO, and production sectors.	Experiments tend to repetitions of previous trials; failure to discontinue non-productive research; reviews focus chiefly on new activities submitted for approval rather than on outcomes of previous work.
Human Resources Development and Management	Researchers selected on basis of clear job descriptions based on Programme plans, and given opportunities for in-service training and participation in national and international conferences to upgrade skills; research performance monitored and evaluated on basis of objective criteria.	Low research productivity due to lack of congruence between work plan and skills; low morale due to lack of ineffective monitoring and evaluation linked to an appropriate reward system.
Financial Management	Each project leader and researcher knows the amounts of funds available for the year or season; funds made available in a timely manner; managers and project leaders receive clear and timely reports on expenditures and funds remaining for each activity.	Centralized control of resources by Centre or Station manager, with scientists unable to plan work as they do not know how much they will have available; funds released on a piece-meal basis, and often too late for efficient resource utilization and effective research execution.
Facilities Management	Necessary laboratories, research fields, equipment, farm machinery and vehicles available in relation to research plans; equipment, vehicles and machinery well maintained.	Planned research cannot be carried out; expensive equipment under-utilized or not functional; on-farm work not possible due to lack of mobility.
Research Support	Research supported by well-functioning service laboratories and qualified technicians; biometric service available to assist in analysis of trials and research results; research fields prepared in timely manner for planned experiments.	Inefficient use of researcher time; unreliable research results; experiments cannot be established at the right time; researchers frustrated and non-productive.

FACTOR	CHARACTERISTICS OF STRENGTH	INDICATORS OF WEAKNESS
Linkages	Good linkages of Centre or Station with extension agencies, NGOs, private sector research, local universities or agricultural colleges, and farmer organizations.	Inefficient use of resources; duplication of efforts; poor adoption of technology generated.

32. Applying this type of analysis to individual NARS would reveal different problems for each NARS and its components. Those most likely to be found in most NARS are:

Political Environment

- Inappropriate political influence on the research system, especially in relation to key appointments;
- laws and regulations that make it nearly impossible to weed out non-productive staff;
- lack of appreciation by high-level decision-makers for the value of agricultural research as a profitable investment; and
- pressure by local officials to keep research stations in their area of influence makes it difficult to achieve badly needed consolidation.

Institutional Weaknesses

- Poor inter-institutional and intra-institutional collaboration;
- insufficient involvement of farmers in setting of research agenda and evaluation of results;
- relegation of "farming systems" research to separate, isolated units, rather than promotion of the concept that most scientist should conduct on-farm research with a farming systems perspective;
- insufficient use of socio-economic disciplines;
- hierarchical management structure and attitudes; and
- lack of functional flexibility.

Resource Problems

- Severe underfunding, with national allocations for agricultural research incongruent with allocations for agricultural development;

- resource allocation not related to national priorities, farmers' needs, and research programme requirements;
- inappropriate resource mix, with too high a percentage of budget dedicated to personnel, and not enough for operations;
- overly centralized procedures for resource allocation; and
- budgets largely a compilation of requests rather than used as an effective resource allocation process.

Management weaknesses

- Insufficient delegation of authority;
- lack of management information;
- inadequate procedures for budget preparation and review;
- inadequate evaluation, monitoring and evaluation of research;
- inadequate individual performance evaluation and reward system;
- promotion based strictly on basis of seniority rather than merit;
- heads of institutions and units not selected on basis of management performance; and
- lack of management training.

Leadership Weaknesses

- Lack of respect for leaders when appointed on basis of personal influence or political connections rather than scientific record or leadership abilities; and
- lack of training in leadership skills.

Efforts to strengthen NARS need to focus on helping them overcome such weaknesses, taking into account the local cultural and institutional environment.

B. WHAT IS BEING DONE TO STRENGTHEN NARS

33. Obviously, the point(s) of intervention in this process by the various actors varies, depending upon their interest and competence. At the internal level, the main focus of intervention for policymakers would be at the stages of policy formulation, resources allocation and monitoring and evaluation. These will be most logical points of intervention, not only to ensure that research programmes are well focused and adequately productive, but also to provide sufficient support for implementation of planned research and development activities by NARS's.

34. The point of intervention by external actors is of great importance. As can be seen in Table 1, external actors taken as a group can intervene at all steps in the process. However, taken singly each can make contributions only at selected points of intervention. The CGIAR Centres could play a more useful role at the levels of constraints/potential identification, research programme development, research programme execution and in some areas of policy and strategy formulation. The bilateral and multilateral organizations are equipped to intervene at the levels of policy and strategy formulation, resources allocation and the conduct of monitoring and evaluation.

35. Of equal importance here is the identification of the type and level of interventions by external donors at each step of the process. The type of interventions, in this context, relate to activities that ultimately result in the strengthening of the institutions engaged in research and development (R&D) activities. This aspect will be further discussed in the next section.

1. Criteria for Selection of External Interventions

36. For ease of analysis, the various external interventions for institution strengthening can be organized as follows:

Institution-building interventions:

- formulation of agricultural research policy and strategy;
- development or improvement of organizational structure and management systems;
- establishment or strengthening of physical and/or technical facilities;
- provision of operating funds, including (in some cases) salaries and wages; and
- playing advocacy roles, both at national and international levels.
- ensuring accountability

Technical support:

- provision of advisory services;
- provision of training opportunities, ranging from short-term specialized courses to degree-level education at local, regional or international institutions;
- provision of training materials and methodological publications;
- facilitating attendance of seminars, workshops field visits as well as postdoctoral and visiting scientists and sabbatical programmes;
- supply of information; and
- provision of germplasm.

Collaborative research functions:

- participation in the development and execution of research programmes through various types of collaboration (i.e., consultancies contractual or collegiate);
- assistance in the development of regional collaborative research networks; and
- establishment of networks of desired types (i.e., information, research, etc.).

In listing these external interventions, it must be kept in mind that although their intention is to strengthen agricultural research, they have sometimes had a negative (weakening) impact. For example, the way some donors encouraged governments to get over-extended as regards the recurrent cost of agricultural research by provision of operating funds with insufficient attention to long-term sustainability of the research system. In some cases provision of consultancy services has to some extent tended to reduce the development of local skills and capacity.

37. The selection of external interventions depends on a number of factors associated with the particular internal and external circumstances of the NARS. There is no single model of what constitutes a strong NARS, and no linear set of stages that represents going from a weak to a "mature" NARS. Some of the mature NARS of developing countries and developed countries are the ones that have particularly difficult institutional problems in maintaining a flexible and responsive capability. A healthy strong "small country" NARS will generally look nothing like a strong research system in a large country with large-scale internal financial and political support. In general, the following should constitute the main factors in considering external interventions for NARS of developing countries:

- policy directions and goals;
- governance and accountability;
- quantity and quality of human resources;
- state of development of physical and technical facilities;
- level and sustainability of research funding;
- efficiency and effectiveness of the organization and management system; and
- types and levels of linkages created.

38. The various external suppliers of required interventions to NARS of developing countries can be grouped into the following broad categories:

- ISNAR
- CGIAR policy research Centres

- CGIAR commodity and natural research Centres;
- non-CGIAR research and technology institutions;
- bilateral organizations;
- multilateral organizations;
- NGOs; and
- Multinational (Transnational) Corporations.

39. Prior to the establishment of the CGIAR, support to NARS of developing countries were provided by bilateral and multilateral organizations. For example, the United Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) played a dominant role in establishing or strengthening agricultural research services in developing countries; although other UN organizations such as the IAEA did contribute to a lesser extent in these efforts. Currently, the World Bank, IFAD and others are also major contributors to such efforts. Similarly, several non-governmental organizations (such as foundations) have also traditionally supported the development of agricultural research services.

40. With the expansion of international agricultural research, service and policy Centres through the CGIAR, there is an increased supply of research support to NARS. It would appear that there is a duplication of effort by international organizations in the provision of support to NARS. In fact, there is clear indication that NARS leaders are somewhat confused on how to deal with the increased type and level of supply-driven external interventions.

41. On the other hand, the CGIAR and non-CGIAR research and technology institutions are concerned with the types and level of support they should provide to NARS, not only because of funding instability but also because of efficiency considerations. Hence, there is a clear need to formulate a coherent strategy in identifying and coordinating external interventions to strengthen NARS. Such a strategy should be demand-driven, and based on anticipated development of NARS in the medium and short term period.

2. Roles of Various Players

42. To determine the roles of external players, it is necessary to conceptually identify the kinds of strengthening interventions by external agencies required at each stage of the research development and execution process. The most common requirements are 1) facilities, 2) operating funds, 3) consultancy, 4) training, 5) information, 6) research collaboration and 7) linkages (networks).

43. Obviously, which of these strengthening interventions are required at each step of the process depends upon the state of NARS' development and the kind and level of

assistance available within countries. Generally, newly established NARS, NARS of "small countries" and NARS newly embarking on more upstream research require greater attention. Strengthening should not be seen as a linear process of going through stages of development. Each NARS has to be looked at separately and specific strategies developed to address the local conditions. In a small country they might not go through an adaptive research stage, but invest in greater participation in regional research activities, and invest in the latest high technology information systems.

44. Unfortunately, the expansion and strengthening of NARS, in most cases, has not resulted in increase research outputs commensurate with requirements and the level of support provided. Food/feed and cash crop as well as livestock and fishery production has not kept pace with population demands in many of the developing countries. Of course, such failures can have many causes, but it is an undeniable fact that one of the important causes is associated with unavailability or inaccessibility of appropriate production technologies, production systems and/or enabling policies and incentives.

45. Therefore, there is no question that the need for external interventions for institution strengthening will continue for the foreseeable future. However, two provisions will have to be kept in mind in this respect: 1) the types and levels of interventions should have a diminishing dimension over time as NARS will be expected to further improve in strength and 2) the supply of external interventions should be expected to be more structured and better targeted to specific needs.

46. With these in mind, the anticipated roles of the various external organizations in strengthening NARS can be identified, with such assistance based on the following characteristics of the potential suppliers of this assistance:

- institution objectives and mission goals;
- past assistance traditions;
- currently available skills or expertise;
- available quantity and quality of resources for R&D;
- available level and sustainability of funds; and
- type of linkages created.

Utilizing such criteria, each nation will need to determine for itself which type of assistance it should invite or accept from which external agency. In general terms, however, the following institutions appear to have the greatest comparative advantage for the respective strengthening functions:

Strengthening FunctionInstitutions⁶

	Major Role	Lesser Role
Institution Building		
Improved Facilities	MBDA	
Operating Funds	MBDA	
Advocacy	MBDA, Is, If	CGC, CON
Technical Support		
Advisory (consultancy) Serv.	MBDA, CON	Is, If, CGC, NCG
Training	CGC, MBDA, NCG Is, If, CON	
Information	CGC, Is, If	NCG, CON, TRANS
Germplasm	CGC	NCG, TRANS
Research Cooperation		
Commodities and Disciplines	CGC, NCG, CON, TRANS	
Management and Policy	Is, If	NCG, CON
Linkages (networks)	CGC	Is, If, NCG, MBDA

3. What the CGIAR Centres Are Doing

47. A historical perspective of how the Centres have been involved in various aspects of the strengthening of NARS, and how these activities and relationships have evolved over time, is given in Annex C. This broad overview necessarily generalized on trends in emphases and relationships. It is recognized that not all Centres have followed these general trends in the same manner.

6 MBDA = Multilateral and bilateral development agencies
 CGC = CGIAR commodity and natural resources centers
 Is = ISNAR; If = IFPRI
 NCG = Non-CGIAR Scientific and Research Institutions
 CON = Private Consultants and Consultant Firms
 TRANS = Transnational (multi-national) Corporations

48. For purposes of this Study, the TAC Secretariat produced a very useful summary of the institution-strengthening activities of each Centre, based on the respective Centres' Medium-Term Proposals. This summary was validated by the Centres and is appended as Annex D.

49. A detailed listing and classification of all such activities, in which one or more of the Centres are engaged, is contained in Annex E. This classification was used as the basis for a questionnaire sent to all the Centres, in which the Centres were asked to indicate the following for each activity:

Past

- Have not been engaged in this activity
- Have engaged in this activity occasionally
- Have done this regularly as a normal component of the Centre's work

Currently

- Not engaged in this activity
- A Component of current work of the Centre

Future

- No plans to engage in this activity
- Plan to reduce the level of this activity
- Plan to continue this activity at about its current level:
 - solely
 - jointly, in collaboration with other Centres
 - jointly, in collaboration with ISNAR
 - jointly, in collaboration with IFPRI
 - as part of a "system-wide" programme
- Plan to increase the level of this activity:
 - solely
 - jointly, in collaboration with other Centres
 - jointly, in collaboration with ISNAR
 - jointly, in collaboration with IFPRI
 - as part of a "system-wide" programme

Compilations of the responses to this questionnaire are provided in Annex F.

50. Drawing on the information provided in Annexes C, D, and F, along with budgetary information provided by the TAC Secretariat, some generalized statements can be made about what the Centres have been and are doing to help strengthen NARS.

- Institution-strengthening has been an important component of the Centres since the first Centre (IRRI) was created and continues to be a major activity of all Centres. Until the creation of ISNAR, however, the impact of these activities has largely been to those **components** of the NARS related to the specific mandates of the respective Centres, not to the NARS as whole. The fact that these NARS components frequently operated in a relatively weak institutional environment tended to lessen the impact of the strengthening activities. This realization was an important consideration in the rationale for the creation of ISNAR.
- ISNAR began chiefly as a service organization, devoting much of its resources to diagnostic studies. It has progressively moved towards greater attention to research and development activities. Concomitant to this has been a broadening of its disciplinary coverage to include more staff with training and experience in the socioeconomic and management sciences.
- The principal strengthening services of the Centres (other than ISNAR) have been in the areas of training, information, consultancies, and network development. These have been chiefly with respect to the particular commodities and other research areas directly related to the individual Centres' mandates. From the overview of institution-strengthening activities contained in the 1994-1998 medium term proposals (Annex D), some possible exceptions to this generalization, in which individual Centres indicated current or planned activities broader than their mandate areas, have been noted. CIMMYT's statement that "Increasingly, the major focus of those consultancies is to improve priority-setting and decision-making capabilities in the national systems..." seemed to indicate such a broader approach. However, a subsequent communication from CIMMYT indicated that these are chiefly related to their mandate crops. ICRISAT indicated that it "helps NARS in the establishment of their own information services". IIMI's mission statement includes "supporting the introduction of improved management and policy making", but it is not clear whether this relates only to irrigation management and policies, or to wider, institutional matters. IITA's MTP outlines approaches that it will follow with the specific aim of strengthening the capacity of its NARS clients, which includes "ensure effective planning of appropriate research agendas". ILCA stated that its interactions with NARS "dictate a need to assist in areas such as priority setting and strategic planning as well as counsel on wider issues of appropriate structures for research management and research", and added that "ILCA will seek the collaboration

of ISNAR on the latter issues". IRRI indicated that the one of the objectives of its "National Research Services" is to "help strengthen the capabilities of selected national agricultural research systems".

- As the respective components of the NARS have become stronger, and the Centres have move "upstream" in their research, there has been a gradual shift away from more general production courses to specialized, individual training. Much of the former types of training is now conducted in and by the NARS or in regional collaborative networks. To help in this endeavour, many of the Centres are now engaged in "training of trainers" and courseware development activities.
- As the former "commodity-oriented" Centres have progressively incorporated more research on natural resource and environmental issues, the distinction between the commodity-oriented and natural resources Centres has become more blurred.
- New "systemwide" and "ecoregional" approaches being developed by the Centres offer opportunities for greater participation of the NARS in the CGIAR programmes, and for greater interinstitutional collaboration. Funding constraints currently constrain the Centres from fully utilising these opportunities.
- There is very little overlap between the institution strengthening activities of ISNAR and IFPRI. Such overlap as exists is chiefly in the area of government policies on funding of research; and area in which there is growing collaboration between the two Centres.
- The combination of financial shortfalls with a growing capacity of NARS to do their own training and manage their networks, has led to a gradual decline in the allocation by Centres of budgetary resources, but they remain substantial. Using the TAC classification of activities, the budget allocations for the category "Fortifying NARS" represents 17% of the combined 1996 funding allocations (down from 24% in 1991).

III. FUTURE DIRECTIONS FOR THE CGIAR IN INSTITUTION STRENGTHENING

A. GENERAL DISCUSSION

1. Research on Agricultural Research Systems

51. In spite of several decades of institution-strengthening support from the CGIAR Centres, and a much larger effort by the NARS themselves, with large amounts of investments by bilateral and multilateral donors, NARS, in general remain lamentably weak. More attention is urgently needed to find out why, and to identify what must be done to overcome the most intractable problems. The summary of indicators of strength and weakness in Tables 2-4, and para 32, above, highlight many of the problems. But this analysis is descriptive and qualitative. What is needed is to apply the best available minds in areas such as political, social and management science, from both within and outside the CGIAR, to address these issues and propose remedies. There is now a wealth of information on the performance of many institution-development projects that needs to be studied to synthesise this knowledge and devise strategies for the development of strong, sustainable national agricultural research systems.

52. Perhaps one of the most important new items on the development agenda today is the need to develop indicators for assessing institutional development requirements, and evaluating whether different types of interventions have achieved results. In the past, many institutional development programmes in the areas of research, education and extension were supply led. The problem was diagnosed in one way or another; then inputs such as technical advisors, training and buildings, and organizational recommendations (sometimes blueprints from elsewhere) were provided. Sometimes there were institutional evaluations, but often these were not undertaken or were audits of activities. Sometimes promoters of different interventions would blame "failure" on "other factors". On other occasions, they might claim to have played a major role when in fact their contribution was minor. Today, by contrast, there is much interest on the part of development agencies in finding assessment criteria, comparing alternative institutional interventions, and discussing the cost effectiveness of alternatives.

53. However, the subject is a Pandora's box. In a recent special edition of Public Administration and Development edited by Horton and Elliott, Arthur Goldsmith persuasively sums up some of the dilemmas of institutional assessment and evaluation under three headings. 1) Definitional Problems: "defining and finding measures of institutional development is controversial and tricky." 2) Attribution Problem: "When many variables affect a process (like institutional development), it is arbitrary to quantify the effect of any one variable. Since institutional development activities are often funded by more than one source, to try to ascribe credit or blame for the consequences is vain." It is well known that attribution issues make the results of studies to estimate economic returns to agricultural research investments particularly difficult to interpret. Finally, 3)

Temporal Problems are particularly difficult to address, as the time period required to judge the outcomes of institutional strengthening interventions is generally longer than with other development projects (Goldsmith, 1993; 197).

54. What makes such exercises even more difficult is the reality that different stakeholders in an institutional development project have different interests in the outcomes of the assessment and/or evaluation. The power of different interest groups to dominate the agenda determines how indicators are defined, measured and used. Some of these issues have been illustrated in the case of assessing farming systems research institutions (Biggs and Farrington, 1989).

55. In the past, institutional indicators have frequently concentrated on quantitative input information, such as numbers of scientists of different types, number of research stations, amounts of equipment, and so forth. Alternatively, they have looked at output indicators, such as the number of new varieties released, area under new varieties, number of publications. However, it is now increasingly recognized that measuring 'inputs and outputs' in this way tells us little about the research capability in a particular subject or location. Increasingly, researchers are trying to understand research processes, and to identify indicators that reflect such things as: 1) research sustainability (including the ability of a research group or organization to seek and maintain sources of funding and political support); 2) an ability to maintain relevance to poverty reduction issues; 3) flexibility, and the capacity to respond effectively to changing external or internal information (Brinkerhoff, 1991). While these are difficult issues to address, there is now more recognition that research is needed in this area (TAC, 1994; 145).

56. Such research, as well as the type of analysis described in tables 2-4 and para 32, above, will reveal that "large" NARS are not necessarily "strong" NARS. Large NARS may have many scientists with higher degrees, and "strong" capabilities in many field, but experience other constraints imposed by their very size, such as poor inter-institutional and intra-institutional communication and collaboration. Thus, efforts to strengthen them will require a different set of interventions to rationalize them in order to produce greater effectiveness and efficiency.

2. Emerging Regional Groupings

57. A positive development on the scene of NARS development is the emergence of a range of regional groupings in agricultural research, especially in Africa and Latin America. In Africa, four important regional associations are being developed: SACAR (Southern Africa), ASARECA (Eastern and Central Africa), CORAF (Sahelian zone) and INSAH (Western Africa). In Latin America, there are PROCISUR (Southern South America), PROCIANDINO (Andean countries of South America), PROCICENTRAL (Central America), PROCITROPICOS (Tropical belt of South America) and CARDI (Caribbean islands). These go well beyond the collaborative regional research networks that have been fostered by the CGIAR Centres, which were chiefly commodity-based.

These regional groupings can play a key role in coordination of research and division of labour. In addition, the regional fora being strengthened as part of the Action Plan for greater involvement of NARS in the renewed CGIAR are important actors. All of these can serve as key points of contact for coordinating the activities of CGIAR Centres in the respective regions and influencing the research and institution-strengthening agendas of the Centres. It is vitally important that the regional groupings develop into agile, effective coordination agents. It must also be noted that these regional associations should not be seen as substitute for NARS and that their effectiveness is conditional on the strength of its member NARS. Thus, in the future, various agencies will be concerned not only with the strengthening of NARS, but also of "RARS", which are natural partners for the Centres' ecoregional activities, and donor support to RARS should not overshadow support to the individual NARS in such groupings.

58. The regional groupings could be particularly important for smaller countries. Small NARS do not have the resources to develop sufficient depth in agricultural research, especially in strategic research, to address their production constraints. In RARS made up of smaller NARS, a division of labour, in which countries that are strong in a given area of research can take up such research in service of the entire region, can be achieved for greater efficiency and effectiveness. In RARS in which one country has a stronger NARI, it can also serve as a vehicle for institutional strengthening of the other NARS in the region.

3. Service vs Research

59. This is in reality two separate issues. One relates to the relative emphasis and allocation of resources in the Centres to research as opposed to services (chiefly institutional development and technical assistance). The CGIAR and the TAC have always been concerned that, important as the latter may be, they do not divert the Centres from their principal research function. This was one of the reasons for the creation of ISNAR. Yet, repeated surveys of the views of NARS in relation to external reviews of the Centres, and the 1984 Stripe Review on Training, NARS leaders have indicated that they value these services, particularly training, very highly. Clearly the Centres have a strong comparative advantage in certain types of training and information services, owing to the specialized scientists and libraries they possess. They should continue to provide such services, but only in those areas in which they can do so better than others. As discussed above, the Centres have dynamically evolved the nature of these services in response to changing circumstances, and we have no reason to question the current balance. The advocacy activities of the Centres have broadened from promoting more funding for research in general and for research on specific commodities. In addition to these traditional roles, some of the Centres should continue the more recent trends to also influence public policies in areas such as, soil and water use and conservation, genetic diversity and conservation, and forestry policy issues.

60. The other issue relates to the balance between services and research in the specific area of institutional development. This is chiefly an ISNAR issue, and is addressed under that topic, below.

4. Gender Issues

61. The important role women play in basic food production and nutrition of family members, is widely recognized. With poverty alleviation specifically listed as a goal of the CGIAR in the "Lucerne Action Program", this role is of special importance, as in many situations it is women who are some of the most vulnerable groups in society. The Centres have contributed substantially towards increasing gender sensitivity in NARS through the large numbers of women scientists they have trained over the years, and the various publications on the role of women in agriculture that the Centres have published for their respective regions. Probably the most important contribution the CGIAR has made in this area, however, has been the strong emphasis given to the introduction of a **user perspective** in agricultural research by the Centres. This has been a strong component of the development of participative, on-farm diagnostic and research methodologies and the training of NARS scientists in such methods. As Centres move towards training of trainers, this emphasis should continue in the future. Since women also play a key role in generating effective, sustainable farming methods, gender issues should also be addressed in the developing eco-regional initiatives.

5. Role of the CGIAR within the Global Research System

62. As noted above, the CGIAR represents only three to four percent of the total agricultural research efforts. The proportion of its resources devoted to institutional development and the broader areas of scientific research is no doubt even smaller. In order to play its catalytic role most effectively, it is essential that the CGIAR continues to expand its horizons to link with other institutions involved in related activities. The opportunities for doing so, both for the CGIAR Centres and the NARS, have been vastly improved by the rapidly developing global information networks, through which the existence of national boundaries and distinctions between developed and developing countries are progressively blurred. A discussion paper, on the subject of "Linking with Other Institutions" is appended as Annex G.

63. How can the limited resources of the CGIAR be used to best advantage to improve the effectiveness of NARS? Firstly, such efforts should be demand-driven; i.e. the Centres should not engage in institution-strengthening activities merely because they have something to offer, but rather because there is a felt need on the part of the NARS for such services. Secondly, activities should be focused on the most important gaps that have been identified in relation to NARS weaknesses and the roles others are playing in helping to overcome them. ISNAR is the obvious institution to help NARS in identifying the most important needs, and has been doing so. "Gaps" should be defined as those areas of important needs that are not adequately being serviced by others outside the

CGIAR. But the Centres cannot fill all gaps; instead they should concentrate on services to fill those gaps for which they have a clear comparative advantage. They clearly have such an advantage for training in specialized research areas related to their specific mandates. Such advantages are less clear in areas such as communications. Only ISNAR has a comparative advantage in research and advice on management and organization of agricultural research. The fact that the CGIAR Centres have been devoting a substantial portion of their resources to institutional development is a clear indication that they and their NARS partners have considered this of great importance, and that they have identified gaps that they feel should be filled. They must continue to do so; but resource constraints dictate, and better communication with the broader global research system makes possible, more effective collaboration. "Process" projects, which are concerned with institutional development issues, will help to identify how this can be facilitated. Such projects have been reviewed by Hulme (1995) and Brinkerhoff (1991).

B. FUTURE ROLE OF THE CGIAR CENTRES

1. Future Directions for ISNAR

64. This is not an external review of ISNAR. It is not the remit of this study, nor has the panel had sufficient time to garner the intimate knowledge of ISNAR's activities to judge its effectiveness nor recommend in detail on its future programmes. That will be the responsibility of the forthcoming EPMR of ISNAR. Nonetheless, ISNAR is the premier Centre in the CGIAR System in relation to the strengthening of NARS. Therefore, it was essential that we pay special attention to this Centre in this study, and we hope that the comments on ISNAR's future directions will be of assistance to the EPMR team, as well as to ISNAR itself.

65. The panel wholeheartedly endorses ISNAR's progressive shift from the services to the R & D end of the spectrum of its activities. We believe this trend should continue in the future at an accelerated pace. ISNAR's experience in diagnostic studies in over 50 NARS provides an excellent basis for analysis. This, along with the multidisciplinary team it has assembled, give it unique competence to synthesize knowledge on management of NARS, the types of interventions that are most effective in strengthening them, and to generate improved tools to be used in such efforts.

66. We understand that there is considerable debate within ISNAR as to the proper balance between service and research activities. This is, however, less of an issue than it appears, since service and R & D are points on a continuum that are mutually reinforcing. ISNAR needs to be involved in diagnostic and advisory services not only to help NARS, but also to provide the knowledge and experience that feeds into the R & D processes. And better knowledge and tools are essential for ISNAR and others to be more effective in its advisory and training service functions. The knowledge, methodological tools and publications on these subjects -- disseminated through ISNAR's publications, training and workshops -- at the same time represent international public

goods that can be used by other organizations and consultancy firms to be more effective in their diagnosis and advice. This provides a multiplier effect that frees ISNAR to devote a greater portion of its resources towards the R & D activities.

67. It is now increasingly recognized that the institutional development of research systems is a difficult and complex process which requires more research. Some of the current problems of developing countries are partly the result of misguided interventions in the past. We support suggestions by the TAC to increase research funding in this area. We suggest it is very important that this work should be conducted in collaboration with existing research Centres that have specialized expertise in these areas. Examples are the Science Policy Research Unit (SPRU) at the University of Sussex; Science and Technology Studies programmes at Universities such as Cornell and Bath; and the National Institute of Science, Technology and Development Studies, New Delhi. There is much relevant previous and current research that is not being utilized by the CGIAR system. We would suggest that ISNAR is the natural home for this work, as it is most closely involved in institutional research policy and is using the results of institutional research in their advisory work. Such a commitment would mean involving a greater number of sociologists, political scientists and other social scientists in the CGIAR system. While ISNAR might establish a critical mass of research in this area of policy and public management, other Centres, such as IFPRI, would continue to take on studies on the public management of irrigation, credit, food policy and so forth. Hopefully, collaboration between ISNAR and IFPRI would be possible on some topics relating to research policy and management.

68. In relation to above, we suggest that there is some urgency to increase research on assessment and evaluation criteria. Many development agencies (such as the ODA, the World Bank, IFAD, and regional development banks) undertake projects to promote research and extension systems with insufficient reference to institutional development criteria. This is partly because so little research has been done on these topics. This is not to say that there is not a considerable general literature and expertise on institutional development that could be tapped into. Some of this stems from research on educational assessment and general "process" development projects. ISNAR is already involved in this type of research. The development of greater expertise in this area could contribute significantly to ISNAR's ability to help local research managers develop criteria relevant to local situations.

69. In light of this, an important aspect of ISNAR's research on institutional development issues is clearly its move to establish links with disciplines such as sociology, political science, public administration, and institutional anthropology. Professionals in these fields have looked at these issues for many years and can help provide the logical and theoretical basis for institutional development interventions.

70. In its research, ISNAR should study successful and unsuccessful examples of institution-building activities, both those in which ISNAR has been directly involved and those carried out or supported by others. There are two possible approaches to doing the

research on results and constraints from previous external interventions. One (a "horizontal" approach) would be to work with one or more of the major donor institutions (such the World Bank, regional development banks, and USAID) that have funded many institutional development projects, many of which used an initial diagnosis and set of recommendations done by ISNAR as the basis for the project components. The other approach would be to do this by country, in selected countries in which ISNAR diagnoses and recommendations have been used. In such a "longitudinal" approach it would be best to pick a few countries and do them well. While we tend to favour the "longitudinal" approach, these are not mutually exclusive. ISNAR, correctly, does not wish to be seen as "service" to bilateral and multi-lateral development agencies. However, by working with such organizations in analyzing the results of previous projects, ISNAR would be able to draw out generic lessons that can be applied in development of its own tools and improving its own advice. It is noted that ISNAR is interested in giving greater attention to these issues, but is limited by funding constraints.

71. One of the possible generic tools that ISNAR might give more attention for development is curricula for postgraduate university courses in research institutional development policy and research management. ISNAR has begun work in this area during the past three years and, together with the Network of European Agricultural (Tropically and Subtropically Oriented) Universities and Scientific Complexes Related Agricultural Development, has developed a proposal for possible European Union funding entitled "An Educational Programme on Agricultural Research Management: An Initial Focus on Sub-Saharan Africa".

72. ISNAR should work more closely with the other Centres in joint activities in training and development of training courseware, utilizing the special competence of ISNAR staff and the good facilities and closer contacts with NARS found in the other Centres to the best, complementary, advantage.

73. ISNAR plays an important role in raising issues and promoting awareness of NARS problems among the CGIAR members, similar to the role the IPGRI plays in relation to the state of genetic resources and gene banks. It has a comparative advantage in this role, based on its research, analyses and experience. This does not imply, however, that it is the "spokesperson" for the NARS. The NARS can ably and effectively speak for themselves, especially with the development of the regional NARS fora. Additionally, a "spokesperson" stance by ISNAR would place it in a position of conflict of interest, when, to be effective it is sometimes necessary to make some harsh judgements or give unpalatable recommendations. Also this would raise the question of how ISNAR can be a "representative" of NARS and at the same time be accountable to them.

2. Emerging Priorities for Other Centres

74. The NARS Working Group, at its Nairobi meeting, called for greater attention to specialized, individual training in emerging fields of agricultural science and the need for higher degree training, with the NARS, universities and the Centres working in triangular relationships. This is a good suggestion, and is the direction in which most Centres have already been moving. The rapidly development of information and communication technologies, such as on-line access to information databases and CD ROM, represent excellent opportunities for the Centres to help NARS scientists have more ready access to relevant information. We support the actions the Centres have been making in taking advantage of these opportunities. With the addition of the natural resources Centres, and the re-structuring of the IBPGR into the IPGRI, there are now expanded opportunities for the CGIAR Centres to train specialists and these areas and promote greater attention to them in the NARS.

75. In recognition that the Centres, through their cooperation with NARS, in various ways have an effect on their research and policies, each Centre should develop a monitorable policy regarding the effects of its overall activities on the institutional development, research capability, and research priorities of NARS and regional groupings of NARS.

3. Inter-Centre Collaboration

a. **Between other Centres and ISNAR**

76. The need for closer cooperation between ISNAR and the other Centres has already been alluded to in the discussion on ISNAR, above. Here it should be pointed out that not only should ISNAR take better advantage of the facilities and local contacts of the other Centres, but the latter need to take better advantage of the specialized management expertise at ISNAR. Too many of the individual Centre activities in the area of management training and advice and methodology development with respect to priority setting and programme evaluation, monitoring and evaluation appears to have been done by individual Centres without ISNAR's involvement. This may well have been because ISNAR did not have adequate staff resources to engage in this type of cooperation. A good example of progress in this area is the development of a set of training manuals for programme planning, monitoring and evaluation were developed jointly by a group of representatives from Latin American NARS, ISNAR and CIAT at CIAT.

77. The development of joint activities between other Centres and ISNAR in areas of mutual interest would increase effectiveness and efficiency. Joint projects should be encouraged for training and advisory services in areas such as:

- management practices and leadership skills;

- setting of national, institutional and program research priorities;
- program planning, monitoring and evaluation;
- project preparation and budgeting;
- information systems;
- human resources management; and
- participative, client-oriented research methods.

The key question is how such desirable collaboration can be encouraged. ISNAR indicates that it does not now have the resources to become more actively involved in such joint activities. The obvious way to encourage collaboration and to increase levels of funding for them would be to develop such joint activities under the umbrella of a "systemwide initiative" in institution strengthening. Before encouraging Centres to develop such an initiative, however, the TAC should carefully consider whether or not it is possible to find a way to promote closer collaboration without the management costs and bureaucratic procedures that a formal, systemwide programme implies. A suggestion as to how the basis for such an initiative can be developed is given in para 93, below.

78. While other Centres and ISNAR should work more closely together, there are some areas that should, in the interest of effectiveness and efficiency, be left fully to ISNAR. These include research, training and/or advisory services in organization and structure of national research systems and research institutions; research on, and development of methodologies and training materials for: prioritization of research, management information systems, and financial management in research organizations. Other Centres that are currently engaged in these activities should phase them out, and those planning to become involved in them are encouraged to cancel such plans. Similarly, research and advice on levels of funding and other national research policies should be dealt with only by ISNAR and IFPRI.

b. Between ISNAR and IFPRI

79. IFPRI, like the other Centres, is involved in collaborative research with NARS, training, workshops, and information services, that have an institution-strengthening role. In this respect, what has been said with respect to the other Centres, above, applies. More important, however, is the need to cooperate in the few areas in which there is overlap in the policy and public management arena. Since IFPRI deal largely in national food policies, and ISNAR in agricultural research policies, the overlap is restricted chiefly to those areas in which national food policies include priority setting and funding levels for agricultural research. The panel is pleased to learn that the two Centres are currently working jointly on a project updating the "indicator series", and plan to cooperate in a larger, projected "Agricultural Research Indicators Initiative" describe in IFPRI's funding request for 1996.

c. Among Other Centres

80. There are many good examples of Centres collaborating in institution-strengthening activities, particularly in joint training programmes carried out in regional settings. But we feel this needs further improvement. The coordinating mechanisms being developed by the emerging regional groupings of NARS, referred to above, offer a good channel for such cooperation to avoid duplication, share facilities. The new systemwide programmes will also provide many opportunities for inter-centre collaboration.

4. Centre Responses to Questionnaire

81. It is useful to assess how the Centres' responses to questions about the degree of involvement and nature of collaboration they plan for the future in various types of institution-strengthening activities in relation to the future directions proposed above. As the questionnaire covered 108 categories and sub-categories of activities, it is obviously impossible to comment on all of the responses. A summary of the responses is given in Annex F. In order to present these data in a reasonably concise form it was necessary to aggregate the data from all the non-ISONAR Centres for each activity. While such a compilation provides much useful information on general trends, and how many Centres are involved in or plan to continue or expand activities that appear inappropriate for them, it does not identify these in relation to specific Centres. A more detailed compilation, by Centre, has been left with the TAC Secretariat. The TAC will no doubt wish to study Annex F, as well as the more detailed compilation, in much greater detail as it relates future priorities to Centres' plans.

82. Clearly it is not possible in this paper to include a detailed analysis of each activity listed in Annex F. Some of the most striking information coming out of the questionnaires are summarized below. It should be noted that in many cases Centres reported plans to engage in an activity in more than one modality (e.g. alone, as well as in collaboration with ISONAR or as part of a systemwide programme), therefore the numbers given below, which are derived partially from the raw data, are not always congruent with sums of involvement shown in the table.

- Seven Centres⁷ reported that they plan to continue to provide diagnostic/assessment services at the national level; only one of these with ISONAR; only one that had been providing such services indicated it would reduce these efforts.
- Eight Centres indicated they plan to continue to advise on organizational structure and processes at national level through visits/consultancies; only one

7 Centers in these observations refer to all Centers other than ISONAR

of these in collaboration with ISNAR. Three Centres plan to expand their sponsoring or convening of conferences on this subject; only one in cooperation with ISNAR.

- Three Centres that had been convening/sponsoring workshops or seminars on development of national research priorities indicated that they would reduce or discontinue these efforts.
- Four Centres reported that they plan to expand in the provision of methodological tools for development of national research priorities; one of these was in collaboration with ISNAR, and one with IFPRI. Four Centres plan to expand training efforts in this subject; two of these in collaboration with ISNAR.
- Most of the Centres that have been providing production training courses at their centres indicated that they plan to reduce such efforts; at the same time most plan to continue to provide such service at regional level.
- Most Centres indicated that they plan to continue or expand individual and group training in specialized disciplines. Six Centres indicated that they plan to expand their efforts in postgraduate theses research.
- Most Centres plan to continue training of trainers, and most plan to expand this effort at regional level.
- Most Centres plan to reduce or discontinue training of extension workers; but one plans to expand such efforts (at regional level).
- Seven Centres plan to continue individualized training of information and communication specialists; additionally, three plan to expand such activities.
- Two Centres plan to expand consultancy services for information management systems, neither one in collaboration with ISNAR.
- One Centre plans to provide resident technical assistance staff to help with budgeting and financial management, while even ISNAR does not plan to do this.
- Almost all Centres plan to continue or expand efforts to promote the development of collaborative research networks. Most also plan to support

these networks by provision of coordinators, while two plan to reduce this type of activity.

- Four Centres plan to continue in analyses of alternative methods for priority setting (without involving ISNAR); additionally three plan to expand such efforts (two in collaboration with ISNAR).

83. In general, it was surprising to note how many Centres plan to be involved in aspects of research management, and how few indicated that they plan to do so in collaboration with ISNAR. Centres may well be able to defend involvement in areas such as advice and assistance in development of organizational structure and processes, setting of priorities, and programme planning, evaluation and monitoring of research, and of developing methodological tools in these areas, by asserting that they are doing so in relation to their particular research mandate. What is surprising, however, is how many indicate they plan to do so at the national and institutional level.

5. Allocation of Resources to Institution Strengthening

84. The TAC has requested that this study specifically address the issue of priorities; i.e. whether the proportion of funds currently allocated in the CGIAR system to activities it classifies as "Fortifying NARS", and to the components of this category, is about right, or if it should be increased or decreased in the future. This is of considerable importance to the TAC as it is currently engaged in the preparation of a new priorities paper for consideration for the CGIAR. However, the issues of priorities and resource allocation can be addressed properly only by weighing the importance of one set of activities in relation to the relative importance of other activities competing for attention within the framework of limited resources. The panel conducting this study simply does not have sufficient knowledge, nor resources to acquire it, to pass judgment on such a complex set of issues. All that can be done at this juncture is to comment in general terms on several of the inter-related issues that make up this question, with the hope that these observations will be useful to the TAC as it addresses the broader issue of CGIAR priorities, and to the management and boards of the respective Centres as they review their activities in the light of the new structure and stated goals of the CGIAR system.

85. One issue is the overall level of resources allocated to the strengthening of NARS. This has hovered around the level of 20-25% in the past and has gradually declined in recent years in the face of funding shortfalls to a projected level of 18% in 1996. It is important to note that these figures represent an aggregate of components that make up this category (training, information/communications, organization/management counselling, and networks). More important still is that they are an aggregate of the allocation to these components by 16 individual Centres. Thus, they represent an accumulation of many decisions made by the programmes, management and boards of the respective Centres over the years. The panel is not in a position to question these decisions, as the individual Centres are much better placed to know the needs of the

NARS they serve, the services they can best offer, and the competing demands by their respective programs on available funds.

86. Another issue is the amounts allocated to the respective components are right. In the breakdown provided by the CGIAR Secretariat for the May, 1995 meeting of the Group these were as follows for 1996:

Training	6.8% (down from 9% in 1991)
Information/Communications	6.4% (down from 8% in 1991)
Organization/Management Counselling	2.3% (up slightly from 2.0% in 1991)
Networks	2.2% (down from 5% in 1991)

87. The reduction in the allocations for training is probably the result of two factors. One is that, in the face of funding shortfalls, it is less disruptive to reduce the number of courses and of participants (chiefly travel and subsistence costs) than to discontinue long-term research programmes (chiefly staff costs). When funding shortfalls are seen as temporary, this is a correct stance; however, when such shortfalls are longer-term, it represents a change of priorities, which must be questioned. The other factor is more substantive. In response to views expressed by NARS, and in recognition of the fact that Centres have already trained large numbers of researchers and extension leaders in production-oriented courses and the general "upstream" trends in the Centres' research, there is a strong trend towards more specialized and individualized training. The panel is not in a position to accurately assess whether this trend reduces or increases costs. It may well be, however that it does alter the way in which costs are reported; as travel and subsistence for group training are readily recognized as "training" costs, while the less direct costs involved in Centre scientists guiding specialized, individual trainees may not be so reported. Furthermore, the trend towards more specialized training in the form of dissertation research, postdoctoral fellows, and visiting scientists may be partially reported as research rather than training costs, as these persons are not only being "trained", but are also contributing to the research function.

88. The decline in allocations to "Information/Communication" is probably more a response to budgetary pressures than programmatic considerations. Apparently Centres have seen their services in this area as being of lower priority than competing activities. It is difficult to gauge the correctness of this stance as this category comprises three quite different sets of activities. One is the information needed by a Centre's own scientists. Another is the production of documents needed to inform donors, other scientists and the general public of its accomplishments. The third is the provision of information and documentation services to research partners in the NARS and research networks. Only the latter can truly be classified as serving to strengthen NARS; but all are important to the Centres' operations and fund-raising efforts. New information technologies, such as on-line services and CD ROM, may indeed make it possible to provide information to Centre and NARS scientists less expensively. Furthermore, to the extent that NARS improve their access to information through internal networks and external, on-line and

CD ROM facilities, their dependence on the Centres for such information will lessen. The TAC may wish to obtain the views of NARS on the priority they give to such services from the Centres compared to what they receive from them in research cooperation and technology products and materials.

89. While the panel is unable to comment meaningfully on the appropriateness of the aggregate total of 2.3% allocated to "Organization/management Counselling", some observations on the breakdown in this allocation between ISNAR and the other Centres are in order. In the instructions given to the Centres for calculation of allocations, this category is stated as being composed of two sets of activities: research on the organization and management of research, and advice to NARS. Centers report only the aggregate for the two sets. It is notable that of the \$5.7 million projected for this category in 1996 less than half (\$2.1 million) is attributed to ISNAR, which has the mandate for such services. Eight of the Centres allocate no funds for this purpose. Of those that do, CIMMYT (\$1.2 million) and IRRI (\$0.8 million) make up the largest share. CIMMYT states⁸ its advice to NARS is almost entirely related to the conduct of research at the research scientist level, and that each of its 21 scientists in "Outreach" allocates a portion of time to this activity. CIMMYT further indicates that its work on tools for priority setting and resource allocation is aimed more at questions related to maize, wheat and natural resources research than at the broad institutional level, and that it considers that the procedures it has developed for this, and its experiences, may be useful to national program levels. Other Centres who have reported significant expenditures in these areas would probably respond similarly. Nevertheless, the fact that a large number of Centres have interpreted this category differently by reporting no activities in it, and that the two Centres with the highest allocation are the two oldest in the CGIAR system, suggest that some Centres that felt it important to counsel NARS on organization and management before the creation of ISNAR may be continuing in an activity that should now be left chiefly to the latter. The TAC is advised to question Centres more closely on this issue.

90. The substantial reduction in the allocation to the "networks" category reflects the evolution of the Centres and their NARS partners, and thus represents a positive development. As described in para 5 of Annex C, the Centres' role in regional research networks has diminished as leadership has progressively been passed on to research leaders from the respective regions. This has made it possible to reduce the numbers of scientists outposted for this purpose, and thus reduce the level of resources devoted to this category. A further reduction is seen as possible as this trend continues and with the development of regional groupings of NARS.

91. The final issue in relation to priorities and resource allocation is how the TAC classifies Centre activities into various categories and sub-categories for purposes of

8 Personal communication from Dr. Roger Rowe to the Chair of the panel responding to a statement on this subject contained in an earlier draft of this report, dated July 25, 1995.

reporting total CGIAR allocations. The panel **recommends** that the TAC carefully review its classification system, and how Centres are asked to break down their budgets into these categories. This is particularly important with respect to the "Fortifying NARS" classification. The discussion of the resource allocations in this category, above, demonstrates how disparate activities can be aggregated into the same category, and how easily these data can be misinterpreted. It would be useful to ask Centres to deaggregate their allocations to the "information/communications" category by the three types of activities described above, and to include in the "Fortifying NARS" classification only those activities that provide direct services to NARS. Similarly, Centres should not include activities related to advice with respect to research on their mandated commodities or research areas, but only their research and advice as pertains to the organization and management of research in general, as "Organization/management Counselling". When these are done, it will probably be seen that the allocations to "Fortifying NARS" have been significantly overstated. Only when this is corrected can a judgment be made as to whether this level is right or needs to be adjusted.

6. Concluding Remarks

92. This study should be seen as a step in the process of development of a strategy for CGIAR involvement in strengthening of NARS, rather than as providing the definitive answers to the questions the TAC has raised about this essential set of activities. General conclusions arising from the study include:

- The CGIAR has an important role to play in institutional development; the new, "renewed" CGIAR should continue to play this role in cooperation with the NARS it serves and with other partners in the global agricultural development and scientific community. Each Centre in the system should be committed to this objective; how each develops its programmes in this area will be different, depending on the area of technology generation, the centre's mandate, and the partners with which it works.
- Institution-strengthening activities must be demand-driven, and based on the principal of comparative advantage. ISNAR has a clear comparative advantage in the area of organization and management.
- Closer collaboration among Centres, and particularly between other Centres and ISNAR, can make these activities more effective and efficient. The development of a systemwide programme on institution strengthening offers a possible means of facilitation of such collaboration.
- More research is needed to identify the most important weaknesses that need to be overcome in developing country agricultural research systems; what are the most effective organizational structures, management practices, leadership skills, and research planning, monitoring and evaluation tools; and which types of

external interventions are most useful. ISNAR should continue to take the lead in conducting such research, in collaboration with non-GGIAR institutions that specialize in institutional development science, and with bilateral and multilateral development agencies and banks.

93. Generalizations, however, are not enough. The way forward must be more clearly mapped out. Our panel did not have the time nor resources to provide the details of such a plan. It is suggested, therefore, that as a follow-up and continuation of this study, ISNAR be provided with additional resources to conduct a more comprehensive analysis. A possible approach would be for ISNAR to engage the services of a senior expert for a year to give full-time attention to this subject. Such a person could be a member of ISNAR's staff, or a consultant, and would be expected to visit all the Centres and selected NARS and write a report on what is actually happening on the ground and make suggestions for future activities. As a corollary to this, each Centre would be asked to name a staff member who would be the liaison person for that study. The resulting report could well serve as the basis for a possible systemwide initiative in institution strengthening.

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ANNEX A

SDR/TAC:IAR/95/5

**CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
TECHNICAL ADVISORY COMMITTEE**

Sixty-Sixth Meeting, CIP Hqs., Lima (Peru), 13-24 March 1995

**STRIPE STUDY OF PUBLIC POLICY AND PUBLIC MANAGEMENT
RESEARCH, AND INSTITUTION STRENGTHENING RESEARCH
AND SERVICE IN THE CGIAR**

Proposal for a Framework for an Analysis of Strategic Issues

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

February 1995

**STRIPE STUDY OF PUBLIC POLICY AND PUBLIC MANAGEMENT
RESEARCH, AND INSTITUTION STRENGTHENING RESEARCH AND
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Proposal for a Framework for an Analysis of Strategic Issues

**DRAFT
20 February, 1995**

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1. INTRODUCTION AND BACKGROUND

This paper provides a basic framework and set of definitions for use by TAC and associated collaborators in carrying out the TAC-guided stripe study of public policy/management research and institution strengthening research and service. The focus is on strategic issues and priorities and roles for the CGIAR. The paper builds on TAC's rationale, purpose, and terms of reference for the study, and expands and clarifies them in an operational context.

1.1. Definitions

For the purposes of this study, the three activities under focus are defined as follows:

Public policy research is distinguished here from the predominantly production economics research or socioeconomic analysis used in a complementary fashion to evaluate technical options developed by researchers. It also is distinguished from the socioeconomic research carried out by centres in relation to assessments of farm organization, structure, and operation. While public policy research may use the same microeconomics tools, and the results from the production economics work of centres, it is distinguished from the latter by being defined as *research on the policy environments within which the results of technical research and socioeconomic and production economics research from the centres and national research systems are applied*. Included here is research that helps to define an appropriate agricultural and natural resources science policy for a country.

Public management research involves research on management of agricultural and natural resources related activities by the public sector. (Public management and investment is one set of policy tools or mechanisms available for implementing policies, the others being fiscal mechanisms (incentives, taxes and equity related subsidies) and regulatory (legal) mechanisms.) Thus, in a sense, public management research is part of the broader portfolio of policy research undertaken in the System. Also included is organizational research related to the structure of national agricultural research systems (NARS).

Institution strengthening research and service relate to the System's activities aimed at strengthening national research systems (defined in the broadest sense). Central components of such work in the CGIAR relate to capacity building and provision of more efficient and effective tools for planning and management, and to delivery of research results and development of collaborative activities with NARS that help to build their research capacity. Advisory services also are included. A key in this work is the balance and linkages between research and service or strengthening activities.

1.2. Origin of and Need for the Study

The TAC study is being initiated for several reasons that are expanded on in what follows:

- * There is a lack of clarity regarding the boundaries between socioeconomics research focused at the crop or farm level, public policy and management research, and institution strengthening research in the CGIAR System. Furthermore, we need to understand better how the three most effectively could be related in terms of organizational models and activities and in order to support and complement other research being undertaken by centres and their partners.
- * This lack of clarity means that centres often put forth as policy research work that actually is routine economic or behavioural analysis to support productivity enhancing or maintenance research programmes. The fuzzy boundaries between the three types of work often lead to confusion in terms of appropriate responsibilities and linkages - particularly with IFPRI and ISNAR, but also among other centres. Furthermore, better understanding of the boundaries is needed to improve the process of budget allocation for the activities. The stripe study will develop insights on the distinctions and the alternative ways in which the three might be more effectively implemented in the System, e.g., through forms of integration, inter-centre collaboration, and other forms of coordination. The study will explore the options and make recommendations.
- * In the case of institution strengthening, there is the question of the extent to which the System should be involved in service activities related to institution strengthening. The debate over this question has preoccupied many in the System for a number of years. At the present time, the relevance and legitimacy of the service function is accepted, as indicated by programmes and funding in the System. Given this acceptance, there is the question of balance between research and service, and the question of how to separate the impacts of research in this area from results or outcomes of the service activities. The study will explore these questions.
- * Public policy research appears in the medium-term plans (MTPs) of all but one centre, generally linked to an association with IFPRI, the main policy research institution in the CGIAR System. Yet, reciprocal mention of these other centres in many cases does not appear in the plans of IFPRI, since budgetary provisions do not exist for IFPRI's participation. The same is the case with the Systemwide initiatives and the ecoregional initiatives. IFPRI at latest count is "involved" in 12 of them. Some logical, effective means for organizing, coordinating and implementing public policy/management research in the System is needed. The study will explore the needs and alternative means.

2. SCOPE AND ORGANIZATION OF THE STUDY

It is important to stress at the outset that the TAC study will not be a reassessment of priority topics for public policy, public management and institution strengthening research in the System. The results of the priority assessments done by IFPRI, ISNAR, IIMI, CIFOR and the other centres in the System within the context of strategic planning and

development of medium-term plans are accepted and are being addressed by ongoing work as detailed in centre MTPs. (This does not mean that consultants' reports could not suggest changes in emphasis.)

The study will focus on alternative operational modalities for carrying out research in this area, including, for example, the establishment of a more formal Systemwide programme for policy and management research and one for institution strengthening research and service. It should be noted that while such programmes obviously would have focal points in IFPRI and ISNAR, the focus of the TAC study should be on the options for links with other centres and with the outside world. The centre-specific questions will be addressed by the separate EPMRs for ISNAR and IFPRI that will commence in 1996.

The study will not deal with production economics and socioeconomics research in the System. That activity properly belongs in the centre programmes as part of the evaluation activity associated with research on production systems and so forth. The study will, however, look at the boundaries between this type of research and public policy/management research (as defined above).

The various themes that might be covered in the study are many and varied. The questions being asked differ by subject matter. Thus, the study will involve two distinct, parallel assessments of a) public policy/management research, and b) institution strengthening research and service. Centres will have an opportunity to interact from an early stage with the consultants and TAC Members involved in this study. In what follows, we look separately at the scope and focus of each of these parallel assessments.

2.1. Public Policy and Public Management Research

In the case of public policy and public management research, the scope of the study can be defined by a set of questions that the consultants and study team are being asked to address:

1. What is the overall status of public policy and public management research in the CGIAR related to the priority topics of interest to the System, as expressed in existing MTPs and the results of TAC priority setting activities? What research are others doing in the priority areas of interest?
2. What is the System doing in the way of research in this area? How can the research needs best be met, and is there scope for a better organization of the CGIAR's efforts in this area of work?
3. Is there any evidence that public policy and public management research in the areas of interest have had positive impacts? What have been the successes?
4. Are some particular topics missing or under-represented in the System's overall portfolio?
5. What are the options for organizing, coordinating, and implementing public policy and public management research in the System (including consideration of the

option of a more formal Systemwide initiative, such as in the case of genetic resources)?

2.2. Institution Strengthening Research and Service

In the case of institutional strengthening, including capacity building, the study will take an "outcomes" based approach, i.e., start with a set of desired outcomes (associated with CGIAR activity) and then work backwards to an assessment of the means - both research and service - for achieving those outcomes. Topics such as training and information services will be treated as inputs into capacity building rather than as topics to be investigated as "objectives" in the TAC study. Links - both existing and desirable - to others working in this area, including bilateral and multilateral technical assistance missions and national programmes, will be looked at, to the extent possible.

The main focus in the institution strengthening assessment is on a) the extent to which the CGIAR System should be involved in service functions, and b) the options for links between research and service functions, and the relative advantages and disadvantages of each option.

It should be noted that the CGIAR System has a clear commitment to the strengthening of NARS. There are many actors and activities that can contribute to such capacity building. The relevant question in this study is which activities are appropriate for the CGIAR (as compared to other actors involved in this activity).

The scope of this assessment can be defined by the following set of questions that the study team will be asked to address:

1. What should be the scope of CGIAR involvement in institution strengthening research and service? What is the current rationale in the System for such involvement (given the fact that it is in the System now)? What are the pros and cons of the different arguments for and against such involvement?
2. What are the appropriate linkages between institution strengthening research and service, and to what extent are they from a practical point of view inseparable, as currently argued? (The main argument is that the research is done as support for the service activity.)
3. Is there reason to establish a more formal Systemwide initiative in this area, one that creates stronger linkages and lines of responsibility and decision making? What are the alternative organizational modalities that the System might try in this area?

2.3. Proposed Organization of the Study

In sum, the focus of the TAC study will be on what changes in research and of its organization are needed in the System. This study is not intended to be a review or critique of what currently is ongoing, but rather a strategic assessment of future options and needs in terms of new operational modalities within the System and with partners

outside the System. (It is noted again that separate EPMRs of ISNAR and IFPRI will soon be undertaken and they will provide assessments of the performance and work of the two main centres in the System dealing with the topics being addressed in this stripe study.)

3. PUBLIC POLICY AND PUBLIC MANAGEMENT RESEARCH LINKAGES TO NATURAL RESOURCES MANAGEMENT RESEARCH

There is a parallel ongoing TAC assessment of select strategic issues related to natural resources management research in the system. The two studies are being linked, since many of the pressing policy and institutional issues of relevance to CGIAR policy and public management research are natural resources related. At this stage, linkages are being created by commissioning jointly for the two stripe studies a consultant's analysis of the CGIAR's role related to research on public policy and management issues associated with natural resources management.

Particular policy issues that are important to natural resources and watershed management include, for example, those related to:

- tenure and common property; including water rights issues;
- providing incentives to pursue more sustainable practices (there almost always is a short-term cost involved in such practices);
- public goods, social benefits and externalities;
- organizational linkages and interactions (e.g., related to watershed management and irrigation systems that often depend on a number of different agencies, organizations, and user groups).

4. FOCUSING ON THE INTERNATIONAL DIMENSIONS OF RESEARCH

For all the themes discussed above, the CGIAR System should be doing research only in those areas in which it has a special advantage, i.e., ones that relate to the international character of its centres. More specifically, international research initiatives - including potential ones in public policy, public management, and institutional strengthening - should:

- Globalize methodologies used in local studies to ensure comparability of results across ecoregions, and for common themes or problems within ecosystems.
- Involve locally relevant and responsive research within ecoregions (or watersheds), but with a global perspective to a) take advantage of economies of scale in research, b) maximize use of spillovers from research, c) reduce transactions costs in doing research, and d) allow efficient movement up the learning curve.

- Be multisectoral and multidisciplinary in nature and scope, recognizing the different sectors and disciplines dealt with across the CGIAR System in different centres. Thus, for example, the CGIAR Systemwide water research initiative (which includes policy as a major thrust) should be explicitly linked to ecoregional activities, to activities of crop, livestock, forestry, and fisheries centres, and to various policy-related research issues pursued by such centres as IFPRI and IIMI, e.g., in the area of water policy and common property resource management.
- Take advantage of complementary activities of different suppliers of research, both within and outside the CGIAR System.

Strategic international research generally should be process oriented, i.e., focused on researching the processes by which positive changes can be made, or negative ones avoided. We recognize that we need to introduce a dynamic dimension in order to address the issues associated with process oriented research.

In other words, international institutions have a special advantage in developing the research on processes for sustainable development, use and conservation of natural resources, and for designing technologies to create more sustainable development options under a wide variety of ecoregional conditions.

5. ONGOING CGIAR PUBLIC POLICY, PUBLIC MANAGEMENT, AND INSTITUTION STRENGTHENING RESEARCH.

At the present time, much of the public policy and public management research in the CGIAR is focused on work in IFPRI, IIMI and CIFOR, although much of IIMI's work could be classified as lying somewhere between institution strengthening research and service and public management research. CIFOR and several other centres also look at their work as being to a great extent driven by policy research. ISNAR is the leading Institute for institution-strengthening research in the CGIAR. A more detailed discussion of current research and service work in the CGIAR System is provided in Annex I (to be attached later).

6. IMPLICATIONS FOR THE ORGANIZATION OF THE STUDY

6.1. Scope

As mentioned, the study will involve two distinct assessments addressing two different sets of questions. The first deals with public policy and public management research. This assessment will be led by a TAC Member and at least four consultants will produce short, focused background papers for it. One (possibly two) will produce a paper on public policy research related to natural resources. The second deals with institution strengthening and the major themes of capacity building. This assessment will also be led by a TAC Member. A team of four consultants will prepare linked papers.

6.2. Study Process and Timetable

It is proposed that the study will be conducted in five phases as follows:

Phase 1 (December 1994 to February 1995): Completion of this draft framework paper covering background information and defining scope and proposed topics of the proposed study.

Phase 2 (February to April 1995): Draft framework paper to be discussed by the Committee at TAC 66 and to be sent for comments to Centre Directors. Consultants to be recruited. The TAC Secretariat will prepare an overview paper cataloguing ongoing CGIAR research in the field of study.

Phase 3 (27-28 April 1995): Organization of workshop at ISNAR, The Hague to brief consultants on purpose of review and to provide overview of issues involved. Centres will be invited to participate in this workshop (or to make an input through a contributed paper) and to provide consultants with their centre's perspective.

Phase 4 (May to June 1995): Preparation of working papers on priority topics. Consultants to write synthesis papers constituting a "needs" assessment. Consultations in June on background papers. The consultations would consist of two parts: one to deal with public policy and public management research, and one to deal with institution strengthening research/services. Preparation of progress reports to TAC 67 in July 1995.

Phase 5 (July - September 1995): Finalization of the report, possibly involving another consultation.

**SCHEDULE AND LIST OF PARTICIPANTS OF THE SEMINAR HELD AT
ISNAR, 27-28 APRIL 1995**

REVISED AGENDA

Thursday, 27 April 1995

08.30 - 08.45	Welcome/Introduction	(Bonte-Friedheim/ Gryseels/Muchnik)
08.45 - 09.15	Aims and nature of Study Proposal	(Gregersen/Muchnik)
09.15 - 10.30	Role/Activities of the CGIAR	(Gryseels/Gregersen)
10.30 - 11.00	Coffee break	
11.00 - 12.30	Presentation of Centre viewpoints IFPRI, ISNAR, CIFOR, ILRI, IRRI, IITA	
12.30 - 14.00	Lunch	
14.00 - 15.00	Presentation of Centre viewpoints (Continued) IPGRI, CIAT, ICARDA, ICRISAT, IIMI, WARDA	
15.00 - 15.30	Closed session of panels	
15.30 - 16.00	Coffee break	
16.00 - 17.30	Closed session of panels	

Cocktail at Dr. Bonte-Friedheim's residence

Friday, 28 April 1995

08.30 - 10.30	Panel questions to Centres and general discussion	
10.30 - 10.45	Coffee break	
10.45 - 15.30	Closed session of panels	
15.30 - 15.45	Coffee break	
15.45 - 17.30	Panels' report General discussion and closing comments	(De Janvry/Nickel/ Muchnik/Gregersen)

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Zafar Altaf
Jock Anderson
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HISTORICAL PERSPECTIVE OF CGIAR INVOLVEMENT IN INSTITUTION STRENGTHENING

Commodity-Oriented Centres

1. Institution-strengthening has been an important contribution of the Centres from the very beginning. However, for the commodity-oriented Centres, this effect has been more of a by-product than a stated purpose. The chief purpose of these Centres was to improve human welfare in the developing countries through increased production and productivity of specific crops and animals through the generation and dissemination of improved production technology and scientific knowledge for those crops and animals related to their respective mandates. It was clear that such technology and knowledge would have little or no impact unless it was adapted to local conditions and adopted by local producers. Thus, from the very start, it was clear that the Centres would have to work in close collaboration with researchers in the countries where the commodities in their mandates were produced.
2. At first this collaboration was chiefly one of developing relationships through which researchers in the cooperating countries would receive and test improved genetic materials from the Centres, as well as work with their respective technology transfer agencies to disseminate the new varieties. To do this they instituted training programmes to develop a strong cadre of researchers in the cooperating countries who could carry out this task. Scientists from the Centres also made regular visits to the countries where their materials were being tested and worked closely with their collaborators in the evaluation and selection of improved varieties. They found that their collaborating researchers often worked in an institutional environment in which they lacked scientific literature and specialized equipment. Thus, very early in the life of the Centres they developed bibliographic and information services to provide their collaborators with relevant publications and disseminate the results of the collaborative research efforts. In some cases they also provided equipment to help the local researchers carry out their tasks.
3. Soon, Centres progressively moved away from developing finished varieties to sending out advanced generations for selection under local conditions; then to sending out early generations, and later, in the case of NARS that were strongest in breeding skills, to sending out parental material for crossing locally, or inviting breeders to the Centres to select their own materials for crosses. With these developments the relationships between researchers in the Centres and those in the NARS in many cases evolved from one of collaboration to one of partnership. This relationship was enhanced by many workshops, seminars and conferences at which the cooperating scientists exchanged information and progressively influenced the research agenda of their respective institutions. In some cases scientists from the Centres worked with their partners in helping to develop research plans and priorities.
4. As the gap between performance of technological innovations on research station and farmers' practices became increasingly evident, it was clear that two additional activities were needed. One was to train extension specialists. The other was to encourage more on-farm research and technology validation, and to bring a "farming

systems perspective" to the technology generation process. Methodologies were developed for diagnostic studies, on-farm research, and farmer participation; and these methods were promoted through training and workshops.

5. As these developments progressed, it became evident that the resources of the Centres were inadequate to carry out all of the activities described above, that components of the NARS had been sufficiently strengthened that they could carry out many of them themselves, and that many of the goals could best be achieved through regional cooperation. Thus, the Centres promoted the development of collaborative regional research networks in relation to their mandate commodities and research areas. At first these were chiefly networks for exchanging materials and other technology and sharing information on their performance. Progressively these networks evolved into effective mechanisms for dealing with production problems of regional importance in a cooperative manner and in a division of labour for such research activities. In most cases initial leadership of such networks was by Centre scientists, often out-posted to the region. Through mechanisms such as Steering Committees, responsibility for setting the regional agendas and allocation of resources was passed on to research leaders from the region, and the involvement of Centre scientists has progressively diminished. Funding for such regional programme has come largely from bilateral donors through special projects.

6. Training has been the largest component of the institution-strengthening activities of the commodity-oriented Centres. From its very inception, in 1962, IRRI established a training programme. Indeed all IARCs consider themselves to be **research and training** institutions. The 1984 Strategic study Of Training in the CGIAR System of 1984 clearly indicated that this is one of the most appreciated services of the CGIAR Centres, and that it has had a significant strengthening impact on the NARS. Most of the training at first was in the form of production training courses and individual internships. Soon, more specialized courses and individual training were also given in disciplinary fields and specific research methodology. As the number of persons trained in these fields has accumulated, and as the Centres have moved "up stream" in their research, specialized training in fields such as biotechnology, genetic engineering, genetic resources management, and natural resources management. Short-term, individual internships have progressively moved from training of young researchers to improving skills of mid-career scientists. While long-term training as a component of higher degree studies has always been an important activity, the proportion of training of this type is increasing.

7. Most of the training courses were initially held at the Centres. However, as the magnitude of the task became evident, especially for young researchers and extensionists, the Centres assisted in the development of in-country courses. As the collaborative research networks developed, much of the production-oriented training has also been conducted on a regional basis. Increasingly, in-country training, especially in the stronger NARS, has included participants from neighbouring countries. Centres have assisted these developments through the development of courseware and the training of trainers. The latter is becoming a major thrust in most Centres.

8. Many of the commodity-oriented Centres have also contributed to the NARS by development of agroecological databases and made them available to the NARS. Initially

these were modest efforts designed to help interpret the performance of genetic materials under different conditions, as a aid to interpretation of research results and the selection of parental materials. As the problems of sustainability and environmental issues have become more evident, these services have broadened to GIS databases and land-use analyses.

9. The description of how the collaboration of the Centres with NARS has progressed over time demonstrates that in order to achieve their basic purposes, the Centres have, in the process, contributed substantially to strengthening of the NARS, through training; workshops, seminars and conferences; bibliographic and information services; agroecological and GIS database services; consultation; modest provision of equipment and operational fund; and the development of collaborative research networks. It must be emphasized, however, that **such strengthening was largely only of components of the NARS, not of the NARS in a broader sense.** Some examples of broader strengthening activities were: training in station operations, training and workshops for library and information services, training in biometrics and research methods, and training in laboratory and greenhouse services. These were isolated activities, however, and the Centres were sometimes criticized for engaging in them. Largely, the strengthening activities described above were for those components of the NARS directly related to the commodities and research areas in the individual Centres' mandates. In many cases a broader institution-management function has been served in that persons trained in for research in a specific commodity have later become national leaders, but this was not the principal aim of the training efforts. This piecemeal approach often achieved less strengthening than was intended, because those trained or assisted by them still had to operate in a broader institutional environment of weak management and leadership, and a policy environment not conducive to the desired impact on productivity. Thus, the CGIAR decided to create two new institutions to deal with these broader issues, ISNAR and IFPRI. With the growing importance of natural resources issues, the CGIAR has also expanded to include institutions that deal not only in research but also in issues of resource management.

ISNAR

10. As discussed above, it was clear that individual commodity programmes strengthened through the efforts of the commodity-oriented Centres did not adequately deal with the great need to strengthen the NARS in which these programmes operated. Furthermore, by virtue of their specific mandates, the IARCs only covered a portion of the large numbers of commodities and research areas that the NARS have to address. The first review of the CGIAR System helped to define the boundaries of the IARCs in relation to institution-strengthening, but it was chiefly concerned that they not transgress these boundaries to the detriment of their essential research functions. To deal with the broader issues, it was decided to create ISNAR.

11. As indicated by its name, ISNAR was created within the CGIAR in the late 70's as an "International Service for National Agriculture Research", with the mandate of assisting developing countries to bring about sustained improvements in the performance of their national agricultural research systems. ISNAR's constitution clearly specified that the purpose of this institution is to help strengthen agricultural research capabilities in

developing countries. The ultimate goal of ISNAR's assistance is to enable developing countries to plan, organize, manage and execute research more effectively from their own human, material and financial resources. Additionally the Constitution stated that ISNAR should serve as a linkage between the international agricultural research centres of the CGIAR system and the NARS and as an intermediary to promote bilateral cooperation in the field of agricultural research.

12. To accomplish these goals, ISNAR developed three main functional activities, namely advisory services, research and training. The advisory service is the primary contact between ISNAR and the NARS. Generally the service is carried out in 3 major steps: a diagnostic phase, a planning phase and an implementation phase. The research programme is originally designated to develop solutions to problems detected at NARS level, particularly the development of analytical procedures and management tools for NARS. The training programme is aimed to provide general management training to NARS leaders and/or to senior and middle level managers. This activity, originally carried out mainly at the headquarters, has partially moved to the regions or countries.

13. As an institute with special focus and extensive experience in agricultural research management, ISNAR has strong comparative advantages in performing this role, not only within the CGIAR system but also when compared with other cooperating or donor agencies. Among the main distinguishing features, those which appear of greatest significance are the 3 following ones:

a) ISNAR's services are potentially available to all developing countries. The institute has no political interests and it has the necessary autonomy to make impartial technical and policy recommendations. Its neutrality is a rather unique feature to be highlighted and gives a definite warranty to the diagnostic and planning phase of ISNAR services to countries. Experience (such as ISNAR's support to the reorganization of Uruguay's agricultural research system, for example) clearly demonstrate the great importance of the diagnosis and planning steps conducted under ISNAR assessment. Also, because of its mandate and its goal ISNAR can be reasonably viewed as an "honest broker" among the many actors that sometimes impinge on NARS: governments, NGOs, multilateral donors and other IARCs.

b) ISNAR's services are based on research and experience. Through its multi-disciplinary research, ISNAR develops and adapts management tools to improve the performance of national systems. Its advice to national systems is, in turn, continually refined in the light of experiences across a wide range of countries. This is also a distinct advantage.

c) ISNAR's long term experience in public sector research management distinguishes it from other research management institutes mainly oriented to private sector management. This is of special significance when considering that CGIAR future research agenda that features the protection of the environment and the management and conservation of natural resources. These areas of research are normally not attractive to the private sector. They will be mostly based at the public institutions of the NARS. And they will require an overall evolution of the

NARS and particularly of the NARIs in their programming and functional organization to undertake a research which is different of the classical commodity-oriented type of research the NARS have been conducting until now.

14. During its first five years (1980-1985), ISNAR focused chiefly on Diagnostic reviews of NARS. This service to NARS was well appreciated by them. This favourable impression of ISNAR's impact contributed to the decision by the CGIAR that the institute should continue at the end of the five-year "sunset clause" imposed on it at its creation. The external review of 1985 stated that ISNAR: 1) should strive to be a "centre of excellence"; 2) should develop a "paradigm" on research management; 3) should have experts in priority setting; and 4) should have a programme director at the level of DDG.

15. In 1986 ISNAR produced its first strategic plan. This stated that it is a "research-based service" organization. Its strategy was to improve efficiency, effectiveness and enhanced capacity for planning, organization and management of NARS. It was to take a systems approach incorporating three thematic programme areas: Policy, Organization, and Management. It was to allocate its resources to delivery functions as follows: 50% to advisory services, 25-30% to research (down from 40%), and 20-25% to training (up from 7%).

16. In 1987, ISNAR was reorganized with a DDG for Research and Training and a DDG for Advisory services. Emphasis was to define critical factors for each of the thematic areas, and staff were organized into 12 working groups. The six highest priority groups were: planning and priority setting, organization, linkages, programme formulation and budgeting, monitoring and evaluation, and human resources.

17. The 1991 EPMR ratified the allocation of resources as being Research (25%) Training (17-20%) and the remainder in services. It recommended that ISNAR should pay more attention to synthesizing its country experiences and that it could also appropriately direct some of its research efforts to studying the experiences of agricultural research management in other countries than those in which it has worked. These recommendations tended to confirm ISNAR's characterization of itself as a "research-based service organization", and, indeed implied that the allocation of research should be increased, which might eventually move it in the direction of becoming a "service-based research organization", as is the case for the other Centres.

18. The 1991 Strategic Plan defined three types of Advisory Services: Comprehensive Institutional Development (few countries, multi-year, full system, as a laboratory for development and testing, advisory services and research); Component Strengthening (many countries, shorter term, advisory services and research) and Knowledge Generation and Information Dissemination (all countries, chiefly research, with some training and advisory services), with allocation of resources as: 35%, 40%, and 25%, respectively.

19. As is apparent from the foregoing discussion, ISNAR has struggled over the years over how much of its efforts that should be allocated to services, and how much to research. Its leaders correctly point out that these are indivisible components of the "Research and Development" continuum. In general terms, however, this continuum could be divided into three components: **service, development, and research**. These can

be defined as follows. Service involves activities in support of individual countries. They normally respond to requests from countries, and are often supported by non-core funding from a bilateral or multi-lateral donor. Development activities develop and deliver generic tools to be used in strengthening services, by ISNAR and others. These to some extent a compilation of information and methods developed by others or on the knowledge and experience of ISNAR's staff. ISNAR's ability to develop such generic materials is enhanced by the multi-disciplinary nature of its staff, composed of experienced persons in agricultural research as well as in management science. To the extent that these development activities represent a refinement of tools developed by others, and utilize the experience of earlier ISNAR services, they lap over into the research area. Research involves the compilation and analyses of data from which lessons can be learned to improved the tools developed and the services offered. A partial list of ISNAR activities, using this classification, follows:

Service

- Individual Country Diagnoses
- Advisory and Consultation Services
- Training

Development

- Development of Methods and Tools
 - Priority Setting
 - Programme Planning, Monitoring and Evaluation
 - Budgeting and Financial Management
 - Research Management Information Systems
 - Human Resource Management
 - Training Modules and Materials
- Delivery of Methods and Tools
 - Publications
 - Training
 - Workshops, Seminars, Conferences

Research

- Case Studies on Specific Topics
- Analyses of Usefulness of Various Methods and Tools
- Analyses of Degree of Success of Various Efforts to Strengthen NARS in Selected Countries
 - ISNAR Diagnoses and Advice Alone
 - Donor Projects Based On ISNAR Diagnoses
 - Other Projects

In general terms, ISNAR began mostly at the top end of this list. While it is still engaged in all of these, its emphasis has progressively moved downwards (perhaps the list should be reversed, since this downwards represents an "up-stream" movement . To date little has been done on the third category of the Research list.

20. One of ISNAR's programme areas is policy. This suggest to some that there may be undesirable overlap between ISNAR and the policy activities of IFPRI and the natural resources Centres. In effect there is little overlap, since the ISNAR policy activities are

chiefly in the area of research policy, not food, price or natural resources management policies. The chief area of overlap between ISNAR and IFPRI has been in the area of national policies regarding levels of funding for agricultural research. In this area there is close collaboration between the two Centres, as evidenced by the current, collaborative, effort in updating the "indicator series", and the larger, projected "Agricultural Research Indicators Initiative" describe in IFPRI's funding request for 1996. Some of ISNAR's development and training activities have been conducted jointly with other IARCs.

IFPRI

21. In contrast to ISNAR, IFPRI considers itself to be a "service-based research" institution. Thus the strengthening services it provides to NARS are, like the commodity-oriented Centres, a by-product of its research rather than the a primary objective. IFPRI's activities are more fully covered in the section of this Study on "Public Policy/Management Research". Suffice it here to point out that some of the institution-strengthening activities described, above, for the commodity-oriented Centres, also apply to IFPRI.

Natural Resources Management Centres

22. Recently, several new Centres have been added to the CGIAR System (CIFOR, ICRAF, and IIMI). Like the commodity-oriented Centres, these NRM Centres conduct research related to production, in collaboration with NARS partners. Additionally, they engage in activities related to natural resource management policies. Their institution-strengthening activities are similar to those described for the commodity-oriented Centres, above.

OVERVIEW OF CGIAR MEDIUM-TERM (1994-98) PROPOSALS ON INSTITUTION STRENGTHENING

Introduction

Institution strengthening research and services as they relate to CGIAR activities aimed at strengthening national research systems (NARS in the broadest sense) include:

- (i) Provision of more efficient and effective tools for planning and managing research,
- (ii) Capacity building, (iii) Dissemination of research results, (iv) Development of collaborative activities with NARS that help to strengthen their research capacity and
- (v) Provision of advisory and/or analytical services. Overall, the CGIAR allocates approximately 20% of its core resources, or about 52 million dollars, to these activities. All CGIAR Centres devote a significant proportion of their resources to institution strengthening activities. ISNAR's mandate singles it apart from the other CGIAR Centres in that its primary function is to assist NARS in research planning, management and delivery; the other CGIAR Centres, in varying degrees, engage in all four elements listed under (ii) to (v) above. All 18 Centres put forward institution strengthening proposals in their Medium-Term Plans (1994-98).¹ A brief overview of these proposals follows.

CIAT. CIAT's institution strengthening proposals for 1994-98 are based on a threefold strategy, i.e., (i) To "strengthen national research institutions by providing advanced training for scientists and delivering specialized information through documentation systems, library based services and publications", (ii) To "enhance the efficiency of national research systems and facilitate their linkages with development activities through multi-institutional collaborative projects" and (iii) To "contribute to the formation and strengthening of national and regional training organizations to train professionals dedicated to commodity production and adaptive research". A set of seven activities is outlined in CIAT's MTP. *Research training.* The aim here is to phase out introductory research training so as to move gradually to specialized scientific curricula focusing on mid-career scientists as well as Masters and Doctoral degree trainees; a target of 100 trainees/year is foreseen. Group training will also become more specialized based on 2 - 3 courses per year involving as many as 60 participants. *Training of Trainers.* As CIAT reduces its entry- and intermediate-level training courses, it plans to strengthen its role as a Trainer of trainers; the training will focus on research and production methods, course organization and adult education. *Conferences.* CIAT plans to *reduce* its conferencing activities (eight per annum in recent years), especially in the areas of applied and adaptive research and *increase* its support to advanced research network meetings. *Communications.* In the coming years CIAT's MTP envisages a larger more diverse communications audience with products targeted to specific audience subgroups. New emphasis will focus on the germplasm development research audience, on natural resources scientists, technology intermediaries, national and international decision-makers and on public opinion groups. *Bibliographic information.* CIAT's

¹ Since the development of the MTPs during 1993, ILCA and ILRAD have been merged into ILRI and INIBAP was integrated into IPGRI.

bibliographic information services have been recently modernized. Future activities will seek to keep CIAT apace with developments in information technologies and to enhance national programme information systems through networking and training. Information products (on paper or diskette) will draw heavily on the Centre's databases, on CD-ROM databases as well as worldwide on-line searches in external databases. *Interinstitutional support mechanisms* will underpin the design and planning of collaborative projects and contribute to increased project accountability. Interinstitutional projects will be used as training ground for national programme scientists and decision-makers. *Institutional information system.* An information system on partner and collaborative institutions will be established to support CIAT's institution strengthening programme and activities; the system will collate information from different databases to ensure an integrated institutional support programme. The MTP describes CIAT's institution strengthening activities as a gradual transition from a present to a future scenario. In CIAT's adjustment to the funding crisis of the past years, the Centre had to accelerate the pace of these changes to such an extent that by now practically all the announced strategic changes have already been implemented.

CIFOR. As a recently established international research centre, CIFOR's institution strengthening activities are as yet in embryo. The MTP 1994-98 outlines three activity proposals, i.e., (i) Development of human and institutional resources for forestry research, (ii) Publication and information services and (iii) Database harmonization, integration and dissemination. These three activities will constitute CIFOR's Research Support and Information programme with the main aim of providing institutional, personnel development and information support to the national forestry research systems. *Development of human and institutional resources for forestry research* will involve: (i) providing assistance to the strategic planning and human resource development of developing country research institutions, (ii) workshops and seminars, (iii) the production of texts and electronic teaching materials and (iv) internship training. In this context also, CIFOR plans to engage in strategic collaboration with National Forestry Research systems, in establishing research networks and to develop close collaboration with individual scientists through research programmes and training of Senior Research Associates and visiting scientists. Training will also be directed to management and leadership in forestry research. *Publication and information services* will include, (i) scientific and wide audience publications, (ii) reviews and syntheses of dispersed data (including 'grey' literature) on high priority topics, (iii) selective support to technical journals in developing countries, (iv) regional and global forestry literature searches as well as (v) enhancing the capability of national forestry systems through training in publication and information technologies. The *Database harmonization, integration and dissemination* programme will attempt to make available to developing country scientists, in microcomputer format, the vast range of scientific information on forestry that currently exists in the great colonial and university libraries as well as up-to-date publications. To this end, CIFOR will draw on and harmonize existing computerized databases, and as necessary, develop new ones.

CIMMYT. CIMMYT's MTP summarizes the Centre's institution strengthening activities under three headings, i.e., (i) Training, (ii) Information and (iii) Consultancy services. Specific details are presented for each of the Centre's mandated commodities,

wheat and maize. **Training** at CIMMYT is being fundamentally transferred by increasing the array of specialized and advanced training opportunities, while at the same time reducing entry-level training in crop management research (CMR); however, the Centre is promoting and providing support to regionally organized CMR training programmes managed by national programmes. In-service training programmes will offer more specialized and advanced courses for mid-career researchers. Finally, the visiting scientist programme is being expanded and its focus improved; priority participation is being offered to those candidates who can profitably work for longer periods on well-defined research projects that are relevant both to their own institutions and to CIMMYT's research goals. **Information** products and services are becoming increasingly important to CIMMYT and its partners. Largely drawing on the use of new information technologies, the Centre plans to increase the availability of scientific information, not only to its own staff, but also to colleagues in national programmes. Emphasis will be placed on publishing information of a more technical nature, much of it in refereed journals. However, CIMMYT will continue to publish practical guidelines and manuals to enhance the research and training capabilities of other researchers, especially those in the national programmes. **Consultancy services** are, and will continue to be offered, at the request of the national programmes; such consultancies are based on less frequent, but more structured forms of interaction. CIMMYT's experience to-date suggests that such interactions are proving to be more useful to national programmes and to the Centre and have the added benefit of requiring fewer resources to implement. Increasingly, the major focus of those consultancies is to improve priority-setting and decision-making capabilities in the national systems as well as to collect information that can guide CIMMYT in its own priority-setting work.

CIP. CIP's MTP reflects a new strategy to more effectively integrate research, training and information activities on a global basis so as to achieve greater efficiency in its decentralized collaborative research programmes. The Centre plans to strengthen its bridge-building role to contribute to the development of capability in national institutions such that they will be better able to capitalize on the opportunities available through genetic engineering and other advanced technologies. The current collaborative country research networks will also continue as valuable mechanisms for fostering self-reliance in CIP's partners. The strategy underlying CIP's collaborative research programmes involves close interaction with the national programmes in the identification of research needs, the conduct of research and the dissemination and transfer of research results. A major advantage of this approach is that it directly contributes to the enhancement of the national programmes through training, information dissemination and collaborative research activities. **Training and Technology Transfer.** Over the past two decades, more than 10,000 researchers, extension workers and educators from developing countries have participated in CIP's training programmes. Future training will be based on a needs assessment study of the national programmes; projections will be made for a five-year timeframe. Training will become more specialized (80%) in subject matter and will increasingly encompass regional (45%) and international (35%) fora. A wider set of audiences will be targeted and will include technology transfer, development agents and the private sector. A training-the-trainer approach will be followed. The sustainability of production systems, be they potato, sweet potato or Andean root and tuber crops, will be highlighted in future training curricula. Drawing on advances in computer and video

programmed learning, CIP plans to develop and promote the utilization of techniques such as computer-assisted instruction and simulation. On a more fundamental level, individual training will be offered to NARS scientists in areas such as molecular methodologies for germplasm transformation. **Information Systems and Services.** The development of databases and information services are based on programme-identified needs and will focus on areas for which CIP has a comparative advantage to classify, integrate, manage and conserve valuable data sets collected by national collaborators and Centre staff. CIP's publications programmes will be upgraded to support regional communication activities. Other bibliographic services will include computerized literature searches and the compilation of bibliographies for national programme scientists. Emphasis will also be placed on information management systems including training and assistance to national programmes in their use. Priority will be given to national scientists involved in germplasm improvement and seed programmes. **Supporting National Communication activities** will form a key part of CIP's assistance to national programmes in the timeframe of the MTP. Drawing on advances in information technologies an expanded telecommunications network involving national partners will be developed. Communications support to national programme activities will be aimed primarily at strengthening skills and backstopping take-off efforts. Learning modules for in-service training will also be used to supplement national programme skills in information generation and exchange, farmer-focused media production and database access.

ICARDA. Active participation in the joint planning, implementation and evaluation of collaborative research is, and will continue to be, ICARDA's main contribution to strengthening capability in the national research systems; the Centre's outreach programme is the main instrument of collaboration with the NARs and is targeted on five distinct sub-regions across WANA. ICARDA's collaborative research relies heavily on networking. In addition to collaborative research, the Centre also provides support to the national research systems through, (i) Training and Conferences and (ii) Documentation, publication and information dissemination. **Training and Conferences** are important mechanisms for enhancing the capabilities of national programmes. Since its foundation ICARDA has trained over 6,000 scientists and technicians from more than 50 countries. Training at ICARDA continues to be demand-driven. The Centre's annual training programme is developed during the research and training planning meetings which are held yearly with each national programme. With increasing numbers of trained staff in the national programmes there is a tangible shift towards more specialized training; up to 16 specialized courses per year are envisaged. Individual non-degree training will continue and ICARDA's support to graduate and post-graduate training courses (8-10 trainees per annum) offered by the Universities in the region will be strengthened. Train-the-trainer courses are offered to decentralize from Headquarter to in-country training for technicians and extension staff. **Documentation, Publication and Information Dissemination.** ICARDA's impact in the region relies heavily on its capacity to process and exchange information. The Centre's approach emphasizes the exchange of information with research partners and target audiences, mainly within but also beyond the WANA region, together with the strengthening of national information systems through training, networking and research sharing. Drawing on advances in electronic information technologies new and more accessible data bases (CD-ROM) will be developed. Improved courseware through the development of audiovisual training

modules, computer-based instructional courses as well as conventional training manuals will be developed. Library networking is also being expanded and special project funds will be sought to strengthen the dissemination of Arabic language publications, the training of information personnel in the national systems, particularly in the adaptation and use of new technologies.

ICLARM. ICLARM will continue its strengthening activities through Training, Information, Networking and Collaborative Research. *Training.* A limited number of short courses will be run each year within the Centre's areas of expertise and ICLARM will assist in answering training requests in other areas of fisheries related research. The emphasis, however, will be on development of training materials. *Information.* Mechanisms to disseminate and exchange information are in place; a new communication/information strategy is under development. *Networking.* ICLARM presently coordinates two information-exchange networks and two research networks. The latter networks and involvement of many national institution partners in joint research projects indicate ICLARM's strong commitment to Collaborative Research as a mode of strengthening, where applicable, national research systems.

ICRAF. One of ICRAF's guiding principles is to carry out research and the dissemination of information in collaboration with its main partners, the NARs, with universities and regional research organizations and with NGOs. To this end it has established four Agroforestry Research Networks for Africa (AFRENAs) covering the unimodal rainfall plateau of Southern Africa, the bimodal highlands of East and Central Africa, the humid lowlands of West Africa, and the semi-arid lowlands of West Africa. The AFRENA's are providing a natural focal point for ICRAF's institution building programme. The main elements of this programme are training and information. *Training.* ICRAF's MTP outlines four training projects, i.e., (i) Human resource development, (ii) Training materials, (iii) Education in Africa, and (iv) Education in Latin America and South-East Asia. The broad objective of the human resource development project is to "improve the performance of scientists and development workers in the fields of agroforestry research and dissemination by enhancing their skills and knowledge." At least 30 training courses are foreseen in the period 1994-98. By 1998 at least 40 postgraduate fellows, 20 research fellows, and 40 student attachments will have undertaken field research training under ICRAF's auspices. Training materials in support of these human resource development activities will be prepared; at least three multimedia training packages per year will be prepared, tested and distributed to collaborating NARS. The Education projects are designed to improve the content and delivery of agroforestry curricula at universities and technical colleges, primarily in the countries that are participating in the agroforestry research networks. Activities will include, (i) Development and maintenance of relevant (inventory) education databases, (ii) Coordination of fellowship programmes, (iii) Provision of training workshops, including curriculum development, and (iv) The Establishment of a global network of institutions that advance agroforestry education. The *Information* projects focus on documentation and publications. The objective of the documentation project is to identify, process and disseminate information relevant to agroforestry. Activities will include acquisition and processing of relevant publications, library services, training and advice on information management to NARs, and the development of supporting

databases. The agroforestry bibliographic database (AFBIB) is expected to grow by 5,000 acquisitions a year and will be available on CD-ROM. By 1998 at least three NARS in each ecoregion will have received agroforestry data bases and trained in the skills needed to run them. The main objective of the Publications project is to publish and distribute agroforestry research results generated by ICRAF and others. The centre will continue to publish *Agroforestry Today* and contribute to *Agroforestry Systems and Agroforestry Abstracts*. **Education.** ICRAF's current activities in Education include the coordination and management of the African Network for Agroforestry Education (ANAFE) with 78 member institutions - universities and technical colleges - from 31 countries.

ICRISAT. Collaborative research. ICRISAT's research has been structured as 22 global interdisciplinary research projects. Each project is targeted to have impact in several regions of the semi-arid tropics (SAT) and elsewhere. The conduct of the research relating to each project thus necessitates close collaboration with the NARS of each country embracing the regions of targeted impact. Collaborative research is the cornerstone of ICRISAT's relationships with the national research systems. Effective collaboration is sought through a three-pronged approach:

- direct project-related dialogue (including workshops and conferences) involving NARS staff and the members of ICRISAT's 23 global research project teams;
- dialogue encouraged through established networks (CLAN, WCASRN, ROCAFREMI, ...);
- contacts established through ICRISAT research establishments in 7 countries of the SAT (India, Kenya, Malawi, Mali, Niger, Nigeria and Zimbabwe).

Education and Training. The Training and Fellowships Programme (TAFP) continues to respond to requests for training from the NARS. As training requirements change, so does TAFP's response. As a result, specialist courses on specific research-related topics are increasing, while the 6-month production training courses are being phased out. The specialist short-term courses are held in each of ICRISAT's three main regional sites (in India, Niger and Zimbabwe). Despite the phasing out of the 6-month production training courses (declining from 91 participants in 1990 to 36 in 1994), the total number of participants in ICRISAT training initiatives remains steady at over 200 each year). ICRISAT is encouraging NARS to organize technical-level training in their own countries, and as appropriate will assist in training the trainers. Use is also made of the networks mentioned above to deliver training and support services to the NARS of the relevant programmes.

Information Management. The Information Management and Exchange Programme (IMEP) disseminates ICRISAT research findings and experience through an extensive publishing programme, provides library and bibliographic services, and helps NARS in the establishment of their own information services. ICRISAT currently prints or publishes about 200,000 copies embracing 100 different publications each year. These are freely available to research collaborators, and to many libraries in the NARS of the

SAT and elsewhere. The rate of such publishing will continue to grow. To further facilitate access to ICRISAT-published material, it is planned to increase the extent of electronic publishing: i.e., on diskette, CD-ROM, and the World-Wide Web (Internet). In addition to publishing traditional material electronically, IMEP plans to publish a computer-based expert diagnostic system for crop protection, and a fully searchable germplasm catalogue.

The worldwide Semi-Arid Tropical Crops Information System (SATCRIS) contains bibliographic material relevant to ICRISAT's crops and farming systems. Use of the SATCRIS selective dissemination of information (SDI) service has increased to over 400 subscribers throughout the SAT, and further growth will be encouraged, as will the growth of custom search services.

It is expected that the demand for IMEP participants in NARS information services building exercises will continue to grow; IMEP will continue to be as cooperative as possible in such instances.

IFPRI. One of the main objectives of IFPRI's outreach programme is to strengthen the capacity for food policy research in developing countries including better two-way communication between IFPRI and the NARs and to ensure a high degree of relevance of IFPRI's work to decision making on food policy. IFPRI's sole product on offer to the NARs is information which together with training and capacity building constitutes the main elements of IFPRI's institution strengthening support. *Information.* The information programme is at the vanguard of IFPRI's outreach activities. Publications include research reports, books, scientific and wide-audience papers, all mainly earmarked towards the policy research community; international media communication also features in IFPRI's awareness outputs. Over the timeframe of the MTP, IFPRI plans to initiate an annual publication composed of brief reports contributed by members of a network of IFPRI associates that address national and regional agricultural development and food policy issues. IFPRI's library will also contribute to the outreach programme by developing collaboration with NARs libraries. *Training and Capacity Strengthening.* IFPRI's current activities typically focus on methodological and practical training for field researchers and collaborators. IFPRI also provides informal training to its research collaborators by including them at all stages of its policy research activities. In the course of the MTP period, IFPRI plans to establish a general training programme in food, agricultural, and natural resources policy research where the Centre will undertake training courses to meet identified training needs. These courses will be of two to four weeks' duration and these will be meant for policy advisors, policymakers, policy analysts, researchers, academics, and others involved in the areas of food, agricultural, and natural resources policies in developing countries. IFPRI also plans to collaborate with selected teaching, research, and policy research organizations in developing countries on a long-term basis to improve their teaching, research, and policy research programmes thereby enhancing their capacity to conduct similar exercises on their own in their respective countries. These activities, in time, will be expanded to become a focus of regional training and capacity strengthening programmes within different parts of the developing world. Plans are also being prepared to establish at IFPRI a fellowship programme for visiting and/or collaborating post-doctoral, doctoral, and post-masters

scholars. **Seminars, workshops and conferences.** In collaboration with national and international agencies, IFPRI will sponsor seminars, workshops and conferences, primarily on policy research, to be held at national, regional and global venues. Syntheses of research results from different research programmes will constitute an important components of these activities. The division will also establish a biennial IFPRI Lecture Series in order to make IFPRI's work and presence better known to donors and through the media to the general public. An additional means of providing support to the Centre, NARS collaborators and associates is **Networks of IFPRI Associates**. Several regional networks are being planned to be established by the Centre where its members will be professionals employed in national and regional government, and research organizations. Some members of the Network will spend periods of up to twelve months at IFPRI for conducting policy research that is of high priority to their home organizations as well as to IFPRI.

IIMI. In its mission statement IIMI identifies two of its goals in direct reference to institution building, i.e., strengthening national research capacity in the field of irrigation management, and supporting the introduction of improved management and policy making. These goals will be addressed through four sets of activities, i.e., (i) organizational development activities, (ii) professional development activities, (iii) implementation dissemination activities, and (iv) information networks. All four institution strengthening activities are closely inter-woven with and heavily dependent on the Centre's research and support programmes. The objectives of the **Professional Development** programme are to: (i) improve the capacity of individual researchers to undertake irrigation management research, and (ii) to improve the capacity of irrigation managers to undertake tasks related to the management of irrigated agriculture. IIMI plans to undertake professional development activities such as, (a) offering fellowships and research opportunities to scientists, (b) offering study/research opportunities to managers and policy makers, (c) organizing conferences, seminars and workshops and (d) supporting study visits. Over the MTP period, IIMI plans to develop up to five international courses for irrigation managers and researchers. In addition, it plans to involve 5-10 researchers and 3-5 irrigation managers in hands-on training within its regular programme activities. **Organizational Development.** The objectives of this programme are to: (i) improve the capacity of national research institutions to carry out irrigation management research, and (ii) to improve the capacity of irrigation management institutions to undertake tasks related to the management of irrigated agriculture. Activities will include: dialogues and counselling; conferences, seminars and workshops; and study visits. Most organizational development activities will fall within IIMI's complementary programme, since by and large they will be country specific. IIMI's **Dissemination of information activities** are designed to share research findings and experience with the Centres partners, including a wide range of people holding key positions in national irrigation management agencies and irrigation research systems. A wide range of technical publications will be generated and disseminated to client and donor audiences. Library and documentation services will be expanded and upgraded. Electronic conferencing and communications will be promoted. The installation of a LAN bridge will permit field offices and national partners to access directly any of the institutes databases. IIMI plans to establish **Information Networks** as a channel of communication with its partners and collaborators. It plans to establish a worldwide

network focusing on key irrigation management topics; strong regional lan-networks are envisaged for West Africa, and Latin America and the Caribbean.

IITA. The IITA MTP outlines four approaches which it follows with the specific aim of strengthening the capacity of its NARs clients. These are: (i) Promotion of discussion with NARs to identify common objectives that ensure effective planning of appropriate research agendas; (ii) collaboration with national programmes and regional centres in the development of their research capabilities; (iii) facilitation of the evaluation, adaptation and adoption of IITA technologies by the national and regional centres; and (iv) contribution to the development of research manpower needed by the NARs to effectively generate and utilize improved technologies. The Centre embraces these approaches through its training, information and networking activities.

Training. Various studies suggest that at least 10,000 professionally trained agriculturalists would be required in sub-Saharan Africa by the year 2000. IITA certainly cannot meet this requirement but has set an ambitious target that 2,000 SSA scientists and research technicians will have received further training by the end of the plan period; over the years, more than 6,000 African nations have received training at IITA, and as many as 900 have received post-graduate and non-degree training with IITA support. The centre will continue to support its collaborating scientists and resident scientist training schemes. In the resident scientist scheme, IITA provides scientists to work within a NARs institute to address specific problems for which IITA has appropriate capability; these scientists assist the national system in developing its applied research capacity. Training is one of the major achievements of this scheme. A new development of this scheme which will continue in a revised form over the course of the MTP period is the location of research liaison scientists, in carefully selected host countries; these scientists will play an active leadership role in IITA/NARS collaboration research. The Congo, Côte d'Ivoire and Ghana have been chosen as host countries for West and Central Africa. **Networks.** IITA is involved in more than ten research networks in Africa and values them as an important means of receiving advice on its research priorities and of making available to the national systems its improved technologies for further testing and adaptation to local agroecologies. Increasingly, IITA sees the management of these networks as the responsibility of the NARs. In view of the growing and wide range of networks, the Centre will attempt to contribute to harmonizing and rationalizing existing networks to ensure that they serve the needs of the national systems. **Information**

Services. IITA from its inception attached high priority to the dissemination of information; twenty-five years later the high priority of information still remains valid. During the plan period, information activities will be a more active mechanism for cooperation with NARs. Publication activities will be strengthened. IITA's library policy embraces, not only the acquisition and dissemination of scientific and technical information, but also the provision of assistance to the NARs (libraries and documentation centres) in the strengthening of their library and documentation functions. The development of the core library on CD-ROM and its download to the IITA stations will bring the information closer to the NARs. IITA will also need to develop and become an active participant in Agricultural Information Network for Africa that the CGIAR Centres have recently proposed.

ILCA. During the course of the 1994-98 MTP, ILCA proposes to make a significant contribution to the strengthening of the national systems engaged in research on livestock production. Specifically, the Centre plans to provide: (i) mechanism for the development of a self-sustaining critical mass of livestock scientists in NARs, through networking; (ii) consulting and technical assistance to livestock research and development; (iii) training in research methodologies, data management and analysis for livestock and resource management research; (iv) training and counselling in prioritization, planning, execution, monitoring and evaluation of livestock and resource management research; (v) opportunities for early career NARs scientists to develop and consolidate their research experience through graduate and postgraduate fellowships; and, (vi) access to information, in different forms, to support livestock research and development. To realize these goals, ILCA proposes to strengthen its work in collaborative research networks, in consulting and technical assistance to NARs and in training and information.

Collaborative research networks. During the life of this MTP, ILCA will continue to promote and encourage the activities of the collaborative research networks. Priority research areas have been identified for each of the three ILCA instigated networks, i.e., African Feed Resources Networks (AFRNET), the Cattle Research Network (CARNET) and the African Small Ruminant Research Network (SRNET). The operational costs of the three coordinators of the networks will be covered from core funding. There is a strong continuing demand on ILCA to provide *consulting and technical assistance to NARs*. The Centre's interactions with NARs dictate a need to assist in areas such as priority setting and strategic planning as well as counsel on wider issues of appropriate structures for research management and research. ILCA will seek the collaboration of ISNAR on the latter issues. In the field of data management, ILCA has developed LIMS, the Livestock Information Management System. LIMS is provided free of charge to NARs in ACP countries and is sold to other potential users. The aim of the **Training and Information Programme** is "to increase the livestock research capacity of NARS by increasing the levels of skills and knowledge of their staff through training and the provision of training materials." ILCA has made a substantial contribution to NARS training and in the course of the MTP plans to extend its impact in this area by collaborating (providing ILCA developed training materials) with other training agencies operating in SSA. ILCA also plans to place training emphasis on trainers. Topics for new core-supported training courses, 1994-98, include (i) crop-livestock-tree interactions, (ii) small-holder dairying, (iii) nutrient cycling in crop-livestock systems, (iv) ruminant nutrition, (v) livestock health and reproduction management, (vi) livestock economics and marketing research, and (vii) experimental design, data management, analysis and interpretation of livestock and crop-livestock research projects. **Information services** are a key component of ILCA's support to the national systems. Its computerized library data base grows by about 5,000 new entries per year. The Centre also offers a 'current awareness' service to over 350 NARS scientists in 37 countries across Africa. Other services to be provided during 1994-98 include retrospective literature searches on demand and the production of specialized bibliographies in hard copy or on diskette. Formal publications are an important part of ILCA's information dissemination activity. In addition to wide audience and newsletter type publications, ILCA publishes a refereed journal, *African Livestock Research*. ILCA's programme of strengthening NARS capacities is an interactive one, and is designed to complement the efforts of other organizations contributing to institution building of the NARS of sub-Saharan Africa.

ILRAD. ILRAD proposes to expand its outreach programme in response to external environment developments such as UNCED Agenda 21 and the CGIAR discussions on livestock research. The main elements of ILRAD's outreach programme, pertaining to the strengthening of NARs, are Cooperative Programmes, Training and Information.

Cooperative Programmes. The objectives of the Cooperative Programmes are (a) "to encourage and develop contacts and establish collaborative research projects between ILRAD scientists and national, regional and international research and development organizations, and (b) to provide advice and counsel to government policy-makers on the design and implementation of research and development programmes aimed at introducing improved control measures for diseases of livestock." ILRAD's collaboration with NARS aims to (i) transfer technology and information pertaining to improved disease control methodologies and (ii) strengthen manpower and institutional development of the NARS. During the MTP period, ILRAD's collaborative programmes will focus on Africa but initiatives will be taken to extend its activities to other regions, i.e. Asia, LAC and WANA. ILRAD will continue to collaborate widely with other international and regional organizations in its institution strengthening activities.

Training. ILRAD provides individual training in relevant technical skills for senior technicians and scientists from the NARs; 230 individuals have been trained at ILRAD for periods of one week to six months. Selection of trainees will be more critical in future to ensure that candidates are capable of transferring the information and the techniques. Group training courses provide, in response to specific demand from the national programmes, expertise in specific technologies associated with disease diagnosis, parasite biology, and laboratory technology; 550 trainees have participated in these courses. Education and training through graduate programmes provide facilities, scientific expertise and supervision for scientists engaged in masters and doctoral degree work; 84 students have undertaken degree-related training, of whom 68 were African nationals. Scientific workshops are another mechanism to disseminate information on new methodologies for livestock disease research.

Information. ILRAD's information services aim 1) to disseminate information about the Centre's objectives, programmes and scientific results and, 2) to raise public awareness of the importance of ILRAD's research objectives and programmes. In addition to wide audience publication, ILRAD provides information packages for visiting NARS scientists, research fellows and trainees. The Library service provides journals and books and literature searches, as well as a reprint and loan service of scientific publications for NARS scientists. New activities for the Library service will include: databases listing references to tickborne diseases and trypanosomiasis, and in collaboration with other CGIAR centres the establishment of information retrieval networks.

IPGRI. The very nature of IPGRI's role in the conservation of plant genetic resources dictates that it works closely with a wide set of collaborators including national and regional institutions, NGOs and the private sector. The Convention on Biological Diversity emphasizes the importance of strengthening the capacities of countries to conserve and use their genetic resources in a sustainable manner and over 100 countries have established plant genetic resource conservation infrastructures. Yet many national programmes remain weak and depend heavily on external support. This, assistance to countries in the conservation and use of plant genetic resources and the mobilization of international efforts and resources to this end is the keystone of the IPGRI programme.

IPGRI, and its predecessor, the International Board for Plant Genetic Resources (IBPGR), have played an important role in global efforts to strengthen genetic resources conservation and use, through assisting in the establishment of national genetic resources conservation facilities, establishing plant genetic resources collections, training personnel, collecting genetic resources, conducting research to improve conservation technology, helping set management standards for genebanks, and maintaining and disseminating information on plant genetic resources.

As part of its transition from IBPGR in 1994, IPGRI developed a new structure and programme strategy to assist national and regional programmes in formulating and becoming more directly involved in plant genetic resources conservation and use activities. The IPGRI structure comprises *five regional and three thematic groups*. The regional groups are: *The Americas; Asia, the Pacific and Oceania; Europe; Sub-Saharan Africa; and West Asia and North Africa*. The regional groups have an essential role in providing linkages between IPGRI's programme as a whole and national programmes, and in fostering links among national programmes, where appropriate and possible, drawing upon within-region developed country resources and expertise (see below for more details).

The Headquarters-based thematic groups that complement the activities of the regional groups are: *Documentation, Information and Training (DIT); Germplasm Maintenance and Use; and Genetic Diversity*. Together, the eight groups contribute to a collaborative, project-based institutional programme that seeks to fulfil four strategic objectives: (1) To assist countries, particularly in the developing world, to assess and meet their needs for the conservation of plant genetic resources and to strengthen links to users; (2) To strengthen and contribute to international collaboration in the conservation and use of plant genetic resources; (3) To develop and promote improved strategies and technologies for the conservation of plant genetic resources; and (4) To provide an information service to advise the world's genetic resources community of both practical and scientific developments in the field. The most obvious contribution to institution building comes from Objective 1, but all four objectives make an important contribution and draw upon the efforts of all IPGRI Groups. Institution building is specifically reflected in the IPGRI MTP through regionally-based projects aimed at strengthening national plant genetic resources programmes, networking and technology transfer, and through a project of the DIT group aimed at building capacity in developing country universities to offer plant genetic resources courses.

IPGRI provides advice to national programmes on the development of appropriate national genetic resources priorities, plans and strategies, and helps promote these policies and activities among national decision-makers, as well as informing on international developments in the area of genetic resources access and utilization. The interdependence of nations with regard to biodiversity is a compelling argument for the cooperation of all countries in the conservation and exchange of plant genetic resources. In this context, IPGRI supports the formation of *networks* as a means to facilitate the sharing of tasks and genetic resources internationally. The networks are formed on both a crop and a regional basis and IPGRI's contribution includes providing scientific and technical advice and support, training, and assistance in setting up common databases. The latter is just one of

the *information* activities in which IPGRI is involved. Others include the development of global databases on collecting, training, and genetic resources collections, the publication of scientific and technical works, standardization of systems, methodology and tools for the documentation of plant genetic resources, including the development of guidelines on information exchange, a comprehensive library and bibliographic service, and public awareness activities.

An effective national effort depends on the ready availability of qualified scientific and technical staff. For this reason, *training* is a key component of IPGRI's support to national programmes. Through individual and group training, the institute assists countries to achieve an adequate strength of personnel trained in plant genetic resources work at the technical and advanced levels, to enable them to conduct effective national genetic resources programmes and to participate in regional and international activities. With a view to sustainability and self-sufficiency, IPGRI's training programme seeks to build capacity in national programmes to train future generations of plant genetic resources scientists and technicians, through the training of trainers and the development of training curricula and materials in locally-important languages.

INIBAP which was established in 1984, came under the governance of IPGRI in 1994. The development of regional research and training activities is an important element in INIBAP's programme as expressed in two of its three objectives: "to promote research and training efforts to deal with region-specific problems and opportunities, including issues of an agronomic and socio-economic nature", and "to strengthen the ability of NARS to conduct research on banana and plantain". INIBAP is active in strengthening NARS through its regional and thematic programmes. INIBAP has sponsored young scientists in higher degree and short-term courses in tissue culture techniques, agronomy of plantain, *Musa* quarantine and *Musa* disease management. More training is planned on *Musa* virus indexing, *Musa* germplasm management and *Musa* taxonomy through the International *Musa* Testing Program (IMTP) sponsored by UNDP, a thematic activity. In addition to formal instruction, INIBAP provides funds so that NARS can participate in regional network advisory meetings which co-ordinate and set research agenda. INIBAP also aids NARS by supporting visits by research specialists, who investigate problems with local counterparts and offer advice, and by assisting NARS scientists to participate in regional and global conferences. Seed money donated by INIBAP also helps NARS initiate and undertake research projects. The Information and Documentation sub-programme of INIBAP aims to create a free-flow of information within the *Musa* community, overcoming language barriers. It produces MUSARAMA, a journal of bibliographic abstracts, three times a year and INFOMUSA, an international magazine on banana and plantain, twice a year. Both these publications are in English, Spanish and French. Fact-sheets on *Musa* diseases are published and distributed and the sub-programme operates a reprint request and supply service. INIBAP has a mailing list of over 2,400 *Musa* workers in NARS and elsewhere who regularly receive publications. Scientists in NARS are informed of the activities and location of others working on *Musa* through the INIBAP Directory of banana and plantain researcher. Besides regional and thematic publications based on workshops and conferences organized by INIBAP, the sub-programme maintains trilingual bibliographic and research databases. These have a user-friendly interface and have been distributed to

NARS in computer-readable form. Group and individual training on information management and dissemination of information has been undertaken in the African and Latin American/Caribbean regions. Further dissemination of information is planned as an Asian/Pacific communications network is developed.

IRRI. IRRI's MTP outlines two programmes specifically focused to strengthen the research capabilities of its NARS' partners. These are: (i) Information and knowledge exchange and (ii) Natural research services. The goal of the *Information and knowledge exchange programme* is: to create an information environment within which all IRRI clients have timely, appropriate, and economical access to rice-related information. Programme objectives are to: (i) create, produce and disseminate information materials that cover rice research and related issues, that create public awareness, and that are accurate, interesting, and useful; (ii) improve the quality of publication and dissemination of IRRI research results and promote a global exchange of rice research information among scientists; (iii) make rice research information accessible through electronic communication technologies; (iv) maintain the IRRI Library and Documentation Service as the world's major repository of rice literature and facilitate access to the collection by rice scientists worldwide; and (v) serve as a convenor, clearing-house, and forum for dialogue among IRRI partners and the Institute in setting programme strategies and priorities, planning rice research activities, sharing research results, and promoting discussion on institutional and policy issues. *Training.* IRRI's training programme will emphasize sharing responsibilities and promoting collaboration among national programme training centres and institutions. Its objectives are to: (i) provide opportunities for PhD and postdoctoral research, and mid-career training of selected scientists in areas of mutual interest to national programmes and IRRI; (ii) offer group training courses in specialized, upstream areas that parallel IRRI's research activities at headquarters and at consortia key sites; (iii) develop, evaluate, and share training materials in forms that are readily adaptable and easily translated to meet specific national training needs; (iv) facilitate shifting responsibility to NARS for implementing national and regional versions of IRRI-developed courses; and (v) anticipate and respond to national programme training needs by conducting need assessments and by developing and jointly implementing in-country training plans. Training courses have evolved from relatively basic courses in rice production and research methodologies to courses and fellowships that teach new highly sophisticated techniques. *National research services.* The objectives are to: (i) help strengthen the capabilities of selected national agricultural research systems; (ii) provide, through regional projects, research services to countries with relatively small but important rice production areas; and (iii) develop mechanisms to expand the spillover effects of nationally developed technologies to other countries within the same agroecological zone. Core projects support management of and facilitates research services to national programmes. Special funding is used for bilateral assistance projects to support national systems of specific countries.

ISNAR. ISNAR was created specifically to help strengthen National Agricultural Research Systems throughout the developing world. It does this by working in partnership with developing countries to enhance their capacity to develop and put in place appropriate research policies, structures, strategies and management approaches.

ISNAR adopts a broad definition of a NARS: a national agricultural research system comprises all of a country's entities responsible for organizing, coordinating, or executing research that contributes explicitly to the development of its agriculture and the maintenance of its natural resource base. It concentrates on strengthening public sector research management on the request of national governments and supports these services through its research and training. However, it is to be noted that the broader definition of a NARS given above includes universities, non-governmental organizations, and the private sector in ISNAR's work in the degree to which they share and contribute to NARS' goals.

ISNAR's strategy for the 1990s 'Service through Partnership' provides the contextual framework for the MTP proposal. ISNAR will help NARS deal with three major strategic issues during the MTP period: i) institutional sustainability, ii) assessment of institutional performance, and iii) institutional implications of increasing research on natural resources management. In meeting the needs of NARS, and also those who seek to strengthen NARS, ISNAR offers three types of service: i) comprehensive institutional development, ii) strengthening research policy and management components, and iii) generating and disseminating knowledge and information about NARS-building. These three services respond to clear operational goals and resource allocations. Comprehensive institutional development, which assists a limited number of NARS bring about change over a wide range of activities, receives about 30% of core resources. Strengthened research policy and management components, which improve the performance of particular functions and improve management tools in a wide range of NARS, receive about 42% of resources; while targeted generation and dissemination of the improved knowledge and information needed to strengthen NARS claims about 28% of resources. Each of these services involves a mixture of research, advice, and training. ISNAR seeks to multiply the impact of its work through partnerships with other organizations in addition to NARS: international centres, regional organizations, universities, development research institutes, and management institutes in developing and developed countries. The dissemination of its improved management approaches to these partners comes through its collaborative research, training and publications. With its double commitment to improving management approaches and service to NARS, ISNAR is a bridge between upstream and downstream interests involved in the NARS. Regionally, ISNAR's strategy foresees an allocation of core resources of approximately 40% to sub-Saharan Africa, 30% to Asia, 20% to Latin America and 10% to WANA.

ISNAR's mandate is complex. As is apparent from the previous paragraph, ISNAR's work involves choices among regions and countries, policy and management issues to be addressed, and a need to integrate its advisory services, research, and training in the delivery of its products and services to clients of all types. In order to manage this complex mandate, ISNAR has recently adopted a simplified structure based on two programmes: 1. Policy and System Development and 2. Management. These programmes are designed to be client-oriented; to integrate research, advisory services and training in meeting the needs of ISNAR's partners; and to provide the supporting platform for improvements in general knowledge about strengthening NARS. They are supported by a set of specialized service units which report to the Deputy Director General (training, computer services, publications, library).

The Policy and System Development Programme is targeted to the needs of national policymakers. These are the people who must make decisions which define the system and its place within global and regional research, as well as in relation to the rest of the national agricultural technology system (including universities, extension, NGOs and development programmes). The work of the Policy Programme identifies three areas of concern that reflect this broad systems approach: i) research policy at the global and national levels, ii) system structure and organization, and iii) system linkages. It is within this programme that ISNAR has developed the Indicator Series documenting resource allocations to NARS over time; studied the role of the private sector in research; and developed new approaches to research evaluation and priority setting. It is also strongly involved in studies of the financing of research. Its work in system structure and organization includes approaches to master planning of research systems, developing national information strategies, and studies of the particular needs of small countries. In the area of linkages, ISNAR has progressively developed new understanding of linkages of the research system with farmers, extension, universities, farmer organizations and NGOs.

The Management Programme is aimed at bringing about sustained improvements in the performance of national agricultural research organizations in developing countries. Three themes give direction to the programme's work: i) management of organizational change, ii) management of research programmes, and iii) management of resources for research. Under the first theme, ISNAR aims to ensure that good management technologies are being adopted by client organizations and to good effect. The last two themes relate to the performance of agricultural research organizations. ISNAR designs and tests management techniques aimed at helping NAROs improve their capacity to produce relevant and effective research outputs. It is within this programme that ISNAR is developing organizational performance indicators and studying the process of managing change in NARS organizations. The programme management needs of research institute directors and programme leaders are addressed by ISNAR's work on planning, monitoring and evaluation and on management information systems. Their needs as institute managers are addressed by ISNAR's work on human resources, financial management, and management of physical resources.

The two programmes come together in a number of cross-programme activities where system-level and institute-level concerns are integrated. These include ISNAR's work on the policy and organizational implications of natural resources management and on research financing.

The Office of the Director General ensures that the Programmes, supported by the specialized services, are responsive to the requests from national systems and carry out their plans to integrated research, advisory service and training in their mode of delivery. The thematic-based-but-client-oriented programmes fit within the matrix structure of the 'new CGIAR'. They provide the thematic and disciplinary base for input to Systemwide initiatives convened by others as well as the breadth in coverage to be the convener for Systemwide initiatives in research policy, management, and NARS-strengthening.

WARDA. WARDA's institution strengthening activities are based on the conduct of partnership research together with the provision of relevant training and information services to the NARs scientists engaged in rice research within its mandate region. Partnership (WARDA/NARs) is the cornerstone of WARDA's strategy which aims to assist national programmes in adaptive rice research and technology transfer. To this end it has developed an "open centre" institutional framework within which "to attract, focus and facilitate the efforts of teams of collaborators working together in an integrated regional research programme." The collaborative research programmes offer NARs scientists opportunity not only to influence the direction and conduct of WARDA's work but also the possibilities to strengthen their own research programmes and research capacity. A set of six regional task forces, each of which is chaired by national scientists, has been established to orchestrate and facilitate this two-way collaboration process. Training and the communication of rice research information are key elements in WARDA's support to NARs in these collaborative programmes.

Training. WARDA's training proposals for the 1994-98 MTP period are based on the recommendations of a Training Working Group, consisting of NARs and WARDA scientists, established in 1990. These recommendations addressed a number of issues, including (i) manpower needs of national programmes; (ii) career opportunities for rice scientists and trainers in national programmes; and (iii) establishment of a formalized trainee follow-up and support mechanism. During the course of the Centre's first medium-term plan WARDA trained a total of 289 scientists, research technicians and extension personnel in its group training programme. Group training in the coming years will focus on laboratory and field research techniques, as well as skills in technology transfer. A set of fourteen topics has been drawn up for future group training courses based on the recommendations of the Training Working Group. These will cover research (e.g. genetic evaluation and utilization of rice), production (e.g. water and irrigation management for rice production) and technology transfer (e.g. extension methods in rice production) topics. A programme of individual research-related training, primarily directed at M.Sc., Ph.D and postdoctoral trainees, has also been developed. Postdoctoral scientists will be supported from core funds whereas the research scientist and visiting scientist programme will be implemented through complementary funding. Additional training opportunities will be offered through the organization of conferences, seminars and workshops and a training newsletter, *Trainerlink*, will be published to provide a regional medium for exchange of information in rice science training and research.

Communications. With modern information management equipment backed up by strong collaborative literature exchange arrangements, WARDA plans to consolidate its information dissemination services, and to focus attention on supporting and upgrading the information systems of the national programmes. Activities will include:

(i) increasing library acquisitions including "grey" rice literature; (ii) specialized training of NARs library staff and supply of books and journals; (iii) updating directories of rice research scientists and institutions; and (iv) publication of specialized bibliographies.

Publications. WARDA will continue to produce all its publications in French and English. In addition to its wide audience publications (e.g. Annual Report, Programme of Work and Budget) and conference/workshop proceedings, the Centre will also publish *Rice Terminology*, *Africa Rice Statistics* and *WARDA News*. WARDA also plans to copublish particular material with the NARS, thereby assisting and strengthening their capabilities in communications. The Centre distributes its publications widely throughout its mandated countries.

CLASSIFICATION OF NARS STRENGTHENING SERVICES AND RESEARCH

I. SERVICES TO STRENGTHEN NARS¹

A. At National System Level

1. Diagnostic/Assessment Services
2. Advice on Improvement of Organizational Structure and Processes
 - a. Visits/Consultancy Services
 - b. Resident Technical Assistance Staff
 - c. Workshops, Seminars, Conferences
 - (1) Convening/Sponsoring
 - (2) Participation
3. Assistance in Development of National Research Policies
 - a. Visits/Consultancy Services
 - b. Resident Technical Assistance Staff
 - c. Workshops, Seminars, Conferences
 - (1) Convening/Sponsoring
 - (2) Participation
 - d. Training
4. Development of National Research Priorities
 - a. Provision of methodological tools
 - b. Visits/Consultancy Services
 - c. Resident Technical Assistance Staff
 - d. Workshops, Seminars, Conferences
 - (1) Convening/Sponsoring
 - (2) Participation
 - e. Training

¹ For purposes of this classification, NARS are defined broadly as all of the country's entities responsible for organizing, coordinating, and execution of agricultural research, with "agricultural research" also defined broadly to include crop, livestock, fish, tree and irrigation research, as well as research and related activities aimed at maintenance and of the country's natural resources base.

5. Development of National Resource Management² Policies

- a. Provision of Agroecological information
- b. Development/dissemination of GIS databases
- c. Visits/Consultancy Services
- d. Workshops, Seminars, Conferences
 - (1) Convening/Sponsoring
 - (2) Participation
- e. Training

B. At Research Institution Level

1. Human Resource Capacity Building

- a. Production and Adaptive Research Training
 - (1) Group Training Courses
 - (a) At Centre
 - (b) Regional
 - (c) In-Country
 - (2) Individual, In-service training
 - (a) At Centre
 - (b) With Out-posted Staff
- b. Improving Research Skills in Specialized Disciplines
 - (1) Group Courses
 - (a) At Centre
 - (b) Regional
 - (2) Individual Training
 - (a) Short-term Internships
 - (b) Postgraduate Thesis Research
 - (c) Post-doctoral Fellowships³
 - (d) Visiting Scientists⁴
- c. Improving Skills in OFR and Participatory Research
 - (1) Group Courses
 - (a) At Centre
 - (b) Regional
 - (2) Individual Training

² Management of water, genetic resources and land use

³ These fellowships are defined as those for persons from developing countries for short to medium-terms in which the chief purpose is training, as opposed to Postdoctoral fellowships for persons from all countries, the chief purpose of which is to contribute to the centers' research programs.

⁴ Mid-career researchers from NARS

- d. Improving Research Support Skills⁵
 - (1) Group Courses
 - (2) Individual Training
 - (a) Internships
 - (b) Higher degree thesis work
 - e. Training of Trainers
 - (1) Group Courses
 - (a) At Centre
 - (b) Regional
 - (c) In-country
 - (2) Individual Internships
 - f. Training of Extension Staff (Group Courses)
 - (1) At Centre
 - (2) Regional
 - (3) In-country
 - g. Training of Information and Communication Specialists
 - (1) Group Courses
 - (a) At Centre
 - (b) Regional
 - (c) In-country
 - (2) Individual Internships
 - h. Development of Courseware⁶
2. Improvement of Research Institution Management
- a. Establishment of Research Priorities
 - (1) Visits/Consultancy Services
 - (2) Resident Technical Assistance Staff
 - (3) Workshops, Seminars, Conferences
 - (a) Convening/Sponsoring
 - (b) Participation
 - (4) Training Programme
 - b. Planning, Monitoring and Evaluation
 - (1) Visits/Consultancy Services
 - (2) Resident Technical Assistance Staff
 - (3) Workshops, Seminars, Conferences
 - (a) Convening/Sponsoring
 - (b) Participation

⁵ e.g. biometrics, station operations, laboratory services

⁶ e.g. training manuals, audio-visual training modules, and computer-based instructional courses

(4) Training

c. Budgeting and Financial Management

- (1) Visits/Consultancy Services
- (2) Resident Technical Assistance Staff
- (3) Workshops, Seminars, Conferences
 - (a) Convening/Sponsoring
 - (b) Participation
- (4) Training

d. Development of Management Information Systems

- (1) Visits/Consultancy Services
- (2) Resident Technical Assistance Staff
- (3) Workshops, Seminars, Conferences
 - (a) Convening/Sponsoring
 - (b) Participation
- (4) Training

e. Training in Leadership Skills

3. Information Support

a. Bibliographic Services⁷

b. Publication and Distribution of Research Results

c. Database Integration and Dissemination

- (1) Agroecological data⁸
- (2) Researchers working in various fields
- (3) Research activities in specialized areas

d. Library networking

4. Funding of Research in NARS⁹

a. From Centre Resources

b. As a channel for donor funding

⁷ e.g. literature searches, compilation and dissemination of bibliographies, table of contents and photocopy services

⁸ Includes GIS databases and other information related to natural resources

⁹ Includes provision of equipment and funds for research operations

II. SERVICES TO STRENGTHEN REGIONAL RESEARCH COLLABORATION

A. Promotion and Development of Collaborative Research Networks

B. Support to Collaborative Research Networks

1. Provision of Coordinators
2. Provision of Genetic Material
3. Compilation and Distribution of Information
4. Workshops, Seminars, Conferences
 - a. Convening/Sponsoring
 - b. Participation
5. Visits/Consultancy Services
6. Resident Technical Assistance Staff

III. RESEARCH AND DEVELOPMENT ACTIVITIES RELATED TO STRENGTHENING OF NARS MANAGEMENT

A. Analyses of Various Models and Methods

1. Organizational Structure Models
2. Useful and Non-useful External Interventions
3. Alternative Methodologies for Priority Setting
4. Alternative Methodologies for Programme Planning, Monitoring, and Evaluation

B. Development of Improved Methodologies and Tools

1. Priority-setting at:
 - a. National System Level
 - b. Institution Level
 - c. Programme Level
2. Programme Planning, Monitoring and Evaluation
3. Budgeting and Financial Management
4. Research Management Information Systems

5. On-Farm Research and Farmer Participation
6. Human Resources Management
7. Genetic Resources Collection, Characterization and Preservation
8. Land Use Evaluation
9. Training of Trainers

C. Development of Training Materials for Various Management Practices

1. Priority-Setting
2. Programme Planning, Monitoring and Evaluation
3. Research Management Information Systems
4. On-Farm Research and Farmer Participation
5. Human Resources Management

SUMMARY OF CENTRES' RESPONSES TO QUESTIONNAIRE¹

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
I.A Services to strengthen NARS/1.A. At national system level															
1A1 Diagnostic/Assessment Services	ISNAR	X	X			X	X			X					
	OTHERS	12	11	5	2	2	1	2	1	4					
1A2 Advice on Improvement of Organizational Structure and Processes:															
1A2a Through Visits, Consultancy Services	ISNAR	X	X			X				X					
	OTHERS	10	8	4	2	5		1		3					
1A2b Through Resident Technical Assistance Staff	ISNAR	X	X			X									
	OTHERS	6	3	10	4										
1A2c1 Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X				X								
	OTHERS	7	6	7	1	1		1		1	2		1		
1A2c2 Through Workshops, Seminars, Conferences, - Participation	ISNAR	X	X				X								
	OTHERS	8	7	4	3	2		1		1	1				
1A3 Assistance in the Development of National Research Policies															
1A3a Through Visits, Consultancy Services	ISNAR	X	X			X									
	OTHERS	12	11	3	4	3		1	1	1					
1A3b Through Resident Technical Assistance Staff	ISNAR	X				X									
	OTHERS	5	3	11	2					1					

¹ LEGEND: A = Acting alone; O = Jointly with other (non-ISNAR) Centre; Is = Jointly with ISNAR; If = Jointly with IFPRI; S = Conducting this activity as part of Systemwide programme;
RED = Reduced

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
1A3c1 Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X								X				X
	OTHERS	10	10	5	3	2		1	1	1	1				1
1A3c2 Through Workshops, Seminars, Conferences - Participation	ISNAR	X	X								X				X
	OTHERS	13	13	1	3	3		2	1	3	1				1
1A3d Through Training	ISNAR	X	X								X				X
	OTHERS	6	5	8	1	2	1	1		1	1			1	2
1A4 Development of National Research Priorities:															
1A4a Through Provision of Methodological tools	ISNAR	X	X								X				
	OTHERS	9	7	5		3				1	1		1	1	2
1A4b Through Visits/Consultancy Services	ISNAR	X	X			X									
	OTHERS	12	11	3	2	5	1	1		1	1				
1A4c Through Resident Technical Assistance Staff	ISNAR	X	X			X									
	OTHERS	6	6	9	3	1									
1A4d1 Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X								X				
	OTHERS	12	11	3	2	4		2		1	2				1
1A4d2 Through Workshops, Seminars, Conferences - Participation	ISNAR	X	X								X	X			
	OTHERS	13	11	1	2	6	1	1		2	1		1		1
1A4e Through Training	ISNAR	X	X								X	X			
	OTHERS	6	5	4	2			2			2	1	2		1

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
1A5 Development of National Resource Management Policies:															
1A5a Through Provision of Agroecological Information	ISNAR	X	X				X								
	OTHERS	8	11	2		4	1			4	2	3	1	1	4
1A5b Through Development/Dissemination of GIS Databases	ISNAR	X		X											
	OTHERS	7	9	3		2	1			2	2	2	2	1	6
1A5c Through Visits/Consultancy Services	ISNAR	X	X								X				
	OTHERS	10	9	4	1	3	2	1	1	1	2	1			3
1A5d1 Through Workshops/Seminars/Conferences - Convening/Sponsoring	ISNAR	X	X								X	X			
	OTHERS	8	10	3		3	1	2	1	3	3				4
1A5d2 Through Workshops/Seminars/Conferences - Participation	ISNAR	X	X								X	X			
	OTHERS	11	12	1		5				3	3	2	1	1	4
1A5e Through Training	ISNAR	X	X								X	X			
	OTHERS	8	8	3		5	1			2	3	2	1	2	5
I.B. Services to Strengthen NARS/I.B. At Research Institution Level															
1B1 Human Resource Capacity Building															
1B1a Production and Adaptive Research Training:															
1B1a1a Through Group Training Courses - At Centre	ISNAR			X											
	OTHERS	13	10	4	5	2	2								
1B1a1b Through Group Training Courses - Regional	ISNAR			X											
	OTHERS	12	10	2	3	4	4			2		1			

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
1B1a1c Through Group Training Courses - In-Country	ISNAR			X											
	OTHERS	13	11	2	5	3	3			1		1			
1B1a2a Through Individual, In-service Training - At Centre	ISNAR			X											
	OTHERS	13	12	1	2	6					3	1			
1B1a2b Through Individual, In-service Training - With Outposted Staff	ISNAR			X											
	OTHERS	13	13		3	4	1				4	1			
1B1b Improving Research Skills in Specialized Disciplines:															
1B1b1a Through Group Courses - At Centres	ISNAR	X	X			X				X					
	OTHERS	11	10	2		5	3	1	1	2	4	1			1
1B1b1b Through Group Courses - Regional	ISNAR	X	X						X	X					
	OTHERS	11	10	1	1	5	4	1	1	2	4	2			1
1B1b2a Through Individual Training - Short-term Internships	ISNAR	X	X												
	OTHERS	14	14		1	7	1		1	2	4	1			1
1B1b2b Through Individual Training - Postgraduate Thesis Research	ISNAR			X											
	OTHERS	13	13	1		6	2		1	1	5				1
1B1b2c Through Individual Training - Postdoctoral Fellowships	ISNAR			X											
	OTHERS	13	13	2	1	6	1			2	3	2			
1B1b2d Through Individual Training - Visiting Scientists	ISNAR					X									
	OTHERS	13	12			4	1			1	7	1			

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB1c Improving Skills in OFR and Participatory Research:															
IB1c1a Through Group Courses - At Centre	ISNAR	X	X				X								
	OTHERS	9	8	5		3	1			1	1				1
IB1c1b Through Group Courses - Regional	ISNAR	X	X			X									
	OTHERS	8	7	5		2	1			1	2	1			1
IB1c2 Through Individual Training	ISNAR	X	X			X									
	OTHERS	8	8	3		5	2			1	4	1			1
IB1d Improving Research Support Skills:															
IB1d1 Through Group Courses	ISNAR			X											
	OTHERS	7	7	5	1	3		1			2				1
IB1d2a Through Individual Training - Internships	ISNAR			X											
	OTHERS	10	9	2	1	5				1	3	1			
IB1d2b Through Individual Training - Higher Degree Thesis Work	ISNAR			X											
	OTHERS	6	4	7	1	3					3				
IB1e Training of Trainers:															
IB1e1a Through Group Courses - At Centres	ISNAR	X	X		X										
	OTHERS	10	8	4		3	4	2		1	3				
IB1e1b Through Group Courses - Regional	ISNAR	X	X				X								
	OTHERS	10	9	2		2	3	1		1	6	2	1		2

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB1e1c Through Group Courses - In-country	ISNAR		X				X								
	OTHERS	10	9	3		4	4	1		1	2	1			2
IB1e2 Through Individual Internships	ISNAR														X
	OTHERS	6	5	8		3				2	2				1
IB1f Training of Extension Staff (Group Courses):															
IB1f1 Training of Extension Staff (Group Courses) - At Centre	ISNAR			X											
	OTHERS	3	4	10	2					1					
IB1f2 Training of Extension Staff (Group Courses) - Regional	ISNAR			X											
	OTHERS	5	4	10		2	1								1
IB1f3 Training of Extension Staff (Group Courses) - In-country	ISNAR			X											
	OTHERS	7	6	7	1	2									1
IB1g Training of information and communication specialists:															
IB1g1a Through Group Courses - At Centre	ISNAR	X	X			X									
	OTHERS	7	7	6		2	3	1		1	2	1			
IB1g1b Through Group Courses - Regional	ISNAR	X	X							X					
	OTHERS	6	6	7		3	3	1		1	1	1			
IB1g1c Through Group Courses - In-country	ISNAR	X	X							X					
	OTHERS	4	4	9		3	3	1		1	1				

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB1g2 Through Individual Internships	ISNAR	X	X			X									
	OTHERS	9	9	4		5	3	1		1	3				
IB1h Development of Courseware	ISNAR	X	X							X					
	OTHERS	13	12	1		3	3	2		1	6	1			1
IB2 Improvement of Research Institution Management															
IB2a Establishment of Research Priorities:															
IB2a1 Through Visits/Consultancy Services	ISNAR	X	X								X				
	OTHERS	8	7	4	1	2		1			4		2		1
IB2a2 Through Resident Technical Assistance Staff	ISNAR	X	X			X									
	OTHERS	4	3	9	2	1					1				
IB2a3a Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X												X
	OTHERS	6	7	6	1	2	1	2		1	3		1		1
IB2a3b Through Workshops, Seminars, Conferences - Participation	ISNAR														
	OTHERS	7	7	6		3	1	1		1	3		1		1
IB2a4 Through Training	ISNAR	X	X								X				
	OTHERS	3	4	6		1		3		1	3		2		1
IB2b Programme Planning, Monitoring and Evaluation:															
IB2b1 Through Visits/Consultancy Services	ISNAR	X	X												X
	OTHERS	8	7	6		5		1		1	2				

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB2b2 Through Resident Technical Assistance Staff	ISNAR	X	X								X				
	OTHERS	3	1	12	1						1				
IB2b3a Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X				X								
	OTHERS	7	5	8		2	1			2	3		1		
IB2b3b Through Workshops, Seminars, Conferences - Participation	ISNAR														
	OTHERS														
IB2b4 Through Training	ISNAR	X	X				X								
	OTHERS	4	2	7		2		2		1	1		1		1
IB2c Budgeting and Financial Management:															
IB2c1 Through Visits/Consultancy Services	ISNAR	X	X								X				
	OTHERS	1	1	12	1						1				
IB2c2 Through Resident Technical Assistance Staff	ISNAR			X											
	OTHERS			13							1				
IB2c3a Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X			X				X					
	OTHERS			13									1		
IB2c3b Through Workshops, Seminars, Conferences - Participation	ISNAR	X	X								X				
	OTHERS	1		14											
IB2c4 Training	ISNAR	X	X								X		X		
	OTHERS			11							1		1		1

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB2d Development of Management Information Systems:															
IB2d1 Through Visits/Consultancy Services	ISNAR	X	X								X				
	OTHERS			13							2				
IB2d2 Through Resident Technical Assistance Staff	ISNAR		X		X										
	OTHERS			13							1				
IB2d3a Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X								X				
	OTHERS	1		12									1		2
IB2d3b Through Workshops, Seminars, Conferences - Participation	ISNAR	X	X									X			
	OTHERS	1		13											1
IB2d4 Through Training	ISNAR	X	X								X				X
	OTHERS	1		13							1				
IB2e Training in Leadership Skills	ISNAR	X	X		X										
	OTHERS	1	1	8		1					3		2		
IB3 Information Support:															
IB3a Through Bibliographic Services	ISNAR														
	OTHERS	13	12	2		6	1			2	2	1			
IB3b Through Publication and Distribution of Research Results	ISNAR	X	X								X				
	OTHERS	14	14			7	2		1	3	6				

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IB3c Database Integration and Dissemination:															
IB3c1 Of Agroecological data	ISNAR											X			
	OTHERS	11	13			6	2	1		3	3	2		1	1
IB3c2 Of Researchers Working in Various Fields	ISNAR	X	X			X	X								
	OTHERS	10	10	2		2	1	1		1	4	2			3
IB3c3 Through Research Activities in Specialized Areas	ISNAR	X	X			X									
	OTHERS	10	11	1		2	1	1		1	6	1			3
IB3d Through Library Networking	ISNAR	X	X			X									
	OTHERS	12	13			5	2	1	1	2	5	2			1
IB4 Funding of Research in NARS:															
IB4a From Centre Resources	ISNAR	X	X			X									
	OTHERS	10	9	4	2	5				3	1				1
IB4b As a Channel for Donor Funding	ISNAR	X	X			X	X			X					
	OTHERS	13	13		1	5				3	4	1			2
II. Services to Strengthen Regional Research Collaboration															
IIA Development of Collaborative Research Networks	ISNAR	X	X									X			X
	OTHERS	14	14			6	3		1	5	6		1	1	2

ACTIVITIES		CENTRE	PAST	CURR	FUTURE PLANS											
					NOT	RED	CONTINUE					EXPAND				
							A	O	Is	If	S	A	O	Is	If	S
IIB Support to Collaborative Research Networks:																
IIB1	Through Provision of Coordinators	ISNAR		X			X									
		OTHERS	13	13		2	8	2			2	2				2
IIB2	Through Provision of Genetic Material	ISNAR			X											
		OTHERS	9	11	3		8	3			1		1			
IIB3	Through Compilation and Distribution of Information	ISNAR	X	X			X	X			X					
		OTHERS	14	14			9	1			2	3	1			1
IIB41	Through Workshops, Seminars, Conferences - Convening/Sponsoring	ISNAR	X	X			X									
		OTHERS	14	13	1		9	2		1	3	2	1			1
IIB42	Through Workshops, Seminars, Conferences - Participation	ISNAR	X	X				X			X					
		OTHERS	14	14			10	1			2	2	1			
IIB5	Through Visits/Consultancy Services	ISNAR	X	X								X	X			X
		OTHERS	12	12	2		7	1	1	1	2		1			
IIB6	Through Resident Technical Assistance Staff	ISNAR			X											
		OTHERS	8	8	6	3	2					1	1			
III. Research and Development Activities Related to Strengthening of NARS Management																
IIIA Analyses of:																
IIIA1	Organizational Structure Models	ISNAR	X	X								X	X			X
		OTHERS	5	3	10							1	2			1

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IIIA2 Useful and Non-useful External Interventions	ISNAR	X	X			X	X			X					
	OTHERS	3	2	12							1				
IIIA3 Alternative Methodologies for Priority Setting	ISNAR	X	X								X	X			X
	OTHERS	5	5	7		3				2	2		2		
IIIA4 Alternative Methodologies for Programme Planning, Monitoring and Evaluation	ISNAR	X	X								X	X			X
	OTHERS	3	4	9		2				1	2			1	1
IIIB Development of Improved Methodologies and Tools for:															
IIIB1a Priority Setting at National System Level	ISNAR	X	X			X	X			X					
	OTHERS	4	3	7		2				1	3		2		1
IIIB1b Priority Setting at Institution Level	ISNAR	X	X			X	X			X					
	OTHERS	7	5	6		1				1	4		3		1
IIIB1c Priority Setting at Programme Level	ISNAR	X	X			X	X			X					
	OTHERS	7	4	6		1				1	4		2		1
IIIB2 Programme Planning, Monitoring and Evaluation	ISNAR	X	X								X	X			X
	OTHERS	4	3	7				1		1	3		2		1
IIIB3 Budgeting and Financial Management	ISNAR	X	X								X	X			X
	OTHERS	2	1	13						1					
IIIB4 Research Management Information Systems	ISNAR	X	X								X	X			X
	OTHERS	3	3	11		1				1	1				

ACTIVITIES	CENTRE	PAST	CURR	FUTURE PLANS											
				NOT	RED	CONTINUE					EXPAND				
						A	O	Is	If	S	A	O	Is	If	S
IIIB5 On-Farm Research and Farmer Participation	ISNAR	X	X			X	X			X					
	OTHERS	11	9	3	1	5	2			3	3	1			1
IIIB6 Human Resources Management	ISNAR	X	X			X				X					
	OTHERS	1	1	13						1					
IIIB7 Genetic Resources Collection, Characterization and Preservation	ISNAR			X											
	OTHERS	11	12	2		6	2			3	1	3			1
IIIB8 Land Use Evaluation	ISNAR			X											
	OTHERS	7	8	4		1				1	5	3			3
IIIB9 Training of Trainers	ISNAR	X	X								X	X		X	X
	OTHERS	9	6	7		3	1	1		1	3	2	1		2
IIIC Development of Training Materials for:															
IIIC1 Priority-Setting	ISNAR	X	X			X	X		X	X					
	OTHERS	2	2	9						1	2		2		
IIIC2 Programme Planning, Monitoring and Evaluation	ISNAR	X	X								X				X
	OTHERS	4	3	8		1	1				1	1	2		1
IIIC3 Research Management Information Systems	ISNAR	X	X								X	X			X
	OTHERS			12							1				1
IIIC4 On-Farm Research and Farmer Participation	ISNAR	X	X			X	X			X					
	OTHERS	9	8	4	1	3				2	3	1	2	1	1

LINKAGES WITH OTHER INSTITUTIONS

A central aspect of linkages with other institutions involves the exchange of information. This subject is of particular significance because it is currently undergoing rapid and important changes. These changes are of two main kinds.

Firstly, we are seeing an increased awareness among scientists and the public at large of the ways information is and can be used for different purposes. There are increasing demands in all walks of life for more transparent government, more transparent codes of conduct in professional activities, and so on. The widespread recognition of the implications of how information is generated, exchanged, withheld, disclosed, and presented is bound to have implications for research establishments, including those in the CGIAR system.

This politicization of information issues is associated, secondly, with dramatic technical developments. These have increased the feasibility, in principle at least, of greater transparency and more open discussion in scientific, commercial and political arenas.

The result of these two factors has been an enormous increase in the practice, and a greater increase in the possibilities, of networking, collaboration, and information services generally. Clearly, issues of how information is accessed and used must now be explicitly addressed by any actor in the rapidly changing world of agricultural science and technology.

Organizations involved in national and international agricultural development, both inside and outside the CGIAR system, have of course been concerned with information networks for years. The activities of international Centres in agricultural research networks have been well documented by Plucknett et al (1990) and by Faris (1991). According to Plucknett, agricultural networks in the CGIAR system have so far concentrated on the exchange of materials and of technical and research related information.

How can we characterize these activities within the wide range of information exchanges in which agricultural development organizations are involved? Nelson and Farrington (1994) provide a useful overall framework for analyzing networking and information exchange systems. They draw a distinction between the type of agricultural exchange networks characteristic of the CGIAR, and what they call Information Exchange Networks (IENs). 'The principle distinctions between the two types are:

- 1) Type and degree of research focus: Agricultural research networks are concerned primarily with natural science research. Where an IEN has a research component, it tends to lean more on the social sciences than it does the natural sciences disciplines.

- 2) Degree of formalization: Agricultural research networks generally seek to focus research efforts, based in institutions, on an agreed set of problems in such a way that the benefit anticipated by individual participants exceeds the cost that they incur, and the sum of benefits exceeds aggregate costs. This implies a high degree of organization and formality in agreeing on overall research agenda, research methods, allocation and scheduling of tasks, division of financial and other resources, and format and manner of reporting."

The overall organizational ethos of IENs is informal. However, "distinctions between agricultural research networks and IENs are inevitably more a matter of degree than of absolutes."

The suggestion, then, is of a continuum rather than a dichotomy: "Information exchange" comprises a wide range of activities, and CGIAR Centres, in common with other organizations, are having to consider (increasingly) carefully what kinds of exchanges and networks they enter into, how, with which actors, in which arenas, and so on.

These changes and dilemmas are evident from the experience of IPGRI, as described in the section of their 1993 strategy paper entitled Public Awareness:

"Much work has been done to acquaint IPGRI's scientific partners with genetic resources work. This is balanced by the need to give attention to those whose good will and support holds the key to the future of plant genetic resources: policymakers and those who influence them, e.g. NGOs, and the media. The importance of these audiences cannot be overestimated. A strong sustained commitment to genetic resources at the national level is crucial, both to IPGRI's work and to the global resources programmes. Increased emphasis on these audiences is particularly important at a time when the political aspects of plant genetic resources are receiving greater attention than ever before." (IPGRI, 1994).

The media, they note, is an unpredictable but inexpensive tool for influencing policymakers. IPGRI will undertake an active media relations effort, targeting local papers and journals in the regions as well as high-profile national and international media. Elsewhere the document comments: "NGOs are important, because of their political influence and their close contacts with farmers and rural communities. In many countries they are deeply involved in genetic resources conservation and use. As partners we hope to achieve much." A review of IPGRI publications indicates, finally, that they are contributing information to the political debate on international and local genetic conservation measures.

These considerations clearly go well beyond the kind of networking involved, for example, in a collaborative breeding programme. Where the latter typically involves the exchange of finite, quite easily definable materials and pieces of technical information, the IPGRI literature describes more complex processes of dialogue, involving advocacy, persuasion, and politicking, an explicit engagement with wider policy discourses, and varied interactions with a wide range of institutional actors.

It appears, then, that individual CGIAR Centres will increasingly need to consider their roles in a growing number of international networks. This raises the question as to what those roles should be, and where. Provisionally, we can identify two broad kinds of role.

The first is as a promoter and advocate. ~ This might involve promoting specific, technologies, activities or methodologies. Alternatively, it might be concerned with advocating broad approaches, getting issues onto relevant political agendas, and influencing policy discourses at different levels. This would mean increasing the quality, quantity, and availability of information about the Centre's work (through newsletters, for example).

The second kind of role is as a receiver and assimilator of information. As a member of a network coalition, a Centre may draw on the skills, experience, or strategic advantages of national research organizations, NGOs and the private sector in fields where it is relatively weak. This can be seen as an important and effective way of buying in such expertise. Alternatively, this kind of role may imply a less formal process by which a Centre keeps itself in dialogue with a range of organizations and ideas that affect it, possibly quite indirectly.

Finally, it should be acknowledged that the issues presented by the recent expansion of information technologies are very challenging. In particular, it will be recognized that the roles outlined above tend to imply, on one hand, inviting and even encouraging exposure of research processes to "outside" scrutiny; and, on the other hand, investing in processes of exchange and dialogue that, by their nature and extent, may disturb boundaries and assumptions within and between institutions themselves.

statements to include:

GLOSSARY OF ACRONYMS

ASARECA	Association for Strengthening Research in Eastern and Central Africa
CARDI	Caribbean Agricultural Research and Development Institute
CD ROM	Compact Disk, Read Only Memory
CIAT	International Centre for Tropical Agriculture
CGIAR	Consultative Group on International Agricultural Research
CIDA	Canadian International Development Agency
CIFOR	Centre for International Forestry Research
CIMMYT	International Centre for Maize and Wheat Improvement
CORAF	Conference of African Agricultural Research Managers
EEC	European Economic Community
EPMR	External Programme and Management Review
FAO	Food and Agricultural Organization of the United Nations
GARS	Global Agricultural Research System
IARCs	International Agricultural Research Centres
ICRAF	International Centre for Research in Agroforestry
IBPGR	International Board for Plant Genetic Resources
IFPRI	International Food Policy Research Institute
ILCA	International Livestock Centre for Africa
ILRAD	International Laboratory for Research on Animal Diseases
ILRI	International Livestock Research Institute
INIBAP	International Network for the Improvement of Banana and Plantain
INSAH	Sahelian Institute
IPGRI	International Plant Genetic Resources Institute
IRRI	International Rice Research Institute
ISNAR	International Service for National Agricultural Research
MTP	Medium-term Plan
NARCS	National Agricultural Research Centre/Station
NARI	National Agricultural Research Institution
NARS	National Agricultural Research System(s)
NGO	Non-Governmental Organization
OFR	On-farm Research
ODA	Overseas Development Administration (of the United Kingdom)
RARS	Regional Agricultural Research System
R & D	Research and Development
SACCAR	South African Centre for Agricultural Research
TAC	Technical Advisory Committee
USAID	United States Agency for International Development
UNDP	United Nations Development Programme
WTO	World Trade Organization

