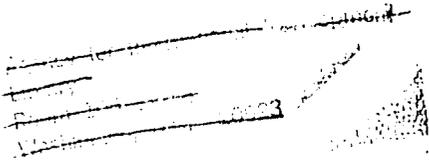


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# Working to strengthen national agricultural research systems

**ISNAR and its strategy**



International Service for National Agricultural Research

The International Service for National Agricultural Research (ISNAR) began operating at its headquarters in The Hague, Netherlands on September 1, 1986. It was established by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force, for the purpose of assisting governments of developing countries to strengthen their agricultural research. It is a non-profit autonomous agency, international in character, and non-political in management, staffing, and operations.

Of the 13 centers in the CGIAR network, ISNAR is the only one that focuses primarily on national agricultural research issues. It provides advice to governments, upon request, on research policy, organization, and management issues, thus complementing the activities of other assistance agencies.

ISNAR has active advisory service, research, and training programs.

ISNAR is supported by a number of the members of CGIAR, an informal group of approximately 43 donors, including countries, development banks, international organizations, and foundations.

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Working to strengthen  
national agricultural  
research systems

**ISNAR** and its strategy

***ISNAR***

International Service for National Agricultural Research

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## Foreword

ISNAR board and management take pleasure in presenting the ISNAR strategy. It provides the conceptual basis for our work and serves as a guide for rational program development.

The strategy makes our long-term goals operational, determines program thrusts in pursuit of that goal, and makes clear strategic choices regarding areas of program concentration.

It builds on the experience gained in ISNAR's first five years, working with some 30 national agricultural research systems, and develops a conceptual framework for institution building.

Because ISNAR is young, and its discipline -- research management in developing countries -- is new, this first strategic planning effort was a lengthy process, extending over one year. It involved intensive consultations with our collaborating partners, the leaders of national agricultural research systems in the developing world. Their inputs into the planning process were essential for program relevance.

In view of ISNAR's specific role in strengthening national agricultural research systems, as part of the emerging global research support system, consultations with the other partners in the system were also needed. Here the focus was on complementarity and division of labor.

Looking back now over the planning period, board and management agree that for ISNAR the process was as important as the product. Particularly for a young institution like ISNAR, the benefits of such a consensus-building effort have been substantial.

Looking forward, we note that strategic planning is not a one-time exercise. Even long-term plans need to be revised in the light of changing circumstances. To maintain relevance and achieve impact, ISNAR will periodically review and update its strategy.

**Henri Carsalade**  
*Chairman of the Board*

**Alexander von der Osten**  
*Director General*

## Chapter 1

# ISNAR'S CHALLENGE IN THE WORLD SETTING

### Generating technology for agricultural development

The pressures on developing countries to develop their agricultural sectors are expected to increase dramatically in coming decades.

The pressures on developing countries to develop their agricultural sectors are expected to increase dramatically in coming decades. The challenges they face are probably more complex — and certainly more urgent — than those confronting the industrialized nations at comparable stages in their development.

A dynamic agricultural sector is central to social and economic growth in most developing countries — and technological progress is the key to agricultural development. The worldwide trend towards science-based agriculture is clear. The need is clear.

With high population growth rates, increasing incomes, and urbanization, food requirements in some developing countries are growing at alarming rates. Food demand is increasing by as much as 3 - 5% per year — and production is not keeping up with demand. In some situations, capacity to meet this increasing demand has been hindered by drought, civil strife, environmental degradation, and technological stagnation. The food population race is particularly acute in Africa.

The poverty problem in some developing countries means that many poor people lack access to adequate food. The nutrition security issue is especially acute in some Asian countries.

Foreign exchange problems in some Third World countries are exacerbated by increasing food imports. The only practical alternative for many countries is increasing domestic food production.

Cash crops are needed for stimulating growth in the agricultural sector, improving the well-being of the rural population, expanding purchasing power, and promoting national economic development.

Environmental degradation is becoming serious in many countries. Population pressure, and resulting unsound agronomic practices, are leading to high rates of soil erosion, especially as the more marginal areas are cultivated. Excessive grazing has adversely affected large areas of rangeland. Salinity has increasingly become a problem as more land is brought under irrigation. Forests are being decimated in many countries. Conserving the quality and stability of the resource base is essential if productivity is to be sustained over the long term.

Most developing countries have exhausted the options of increasing production through expanding into new lands. Progress now depends on improving technologies which increase the combined productivity of all the factors of production — land, labor, and capital — and decrease unit costs of production.

The crucial challenge facing scientists and policymakers is achieving rapid, significant, and sustainable increases in agricultural production, while also conserving the environment and stimulating a robust rural economy. To meet this challenge, technological advances must be complemented and supported by sound food and agricultural policies which stimulate adoption of technologies for increased productivity, development of appropriate infrastructure, and strengthened institutional capacities — particularly in research and extension.

## The key role of national agricultural research systems

National agricultural research systems (NARS) play a key leadership role both in generating and adapting the technology required to meet the agricultural development

challenge.

National agricultural research systems (NARS) play a key leadership role both in generating and adapting the technology required to meet the agricultural development challenge -- they identify technical problems, and develop and adapt appropriate technologies for solving them. Advances in agricultural production are unlikely without a strong national research system.

**Adapting technology.** Many specialized institutions complement developing countries' NARS efforts to increase agricultural productivity -- including universities, international agricultural research centers, regional institutes and networks, bilateral and multilateral development agencies, and private sector research organizations.

But agricultural technology cannot normally be directly transferred to a particular country without testing and adaptation. Technology is often highly location-specific; its usefulness is determined by agro-ecological, socio-economic, and political environments. Hence, national agricultural research systems need to take the lead role in adapting technology to the country.

Only national research leaders are in a position to reflect upon and influence their government's agricultural development policies, define national research needs and priorities; evaluate the findings of the global research community under local conditions; and ensure -- through formal and informal communication -- that the global research community's agenda accurately reflects developing countries' concerns.

**Developing improved technology.** There are many cases in which developing countries' research has produced improved technologies, making a major impact on agricultural production. Some better-known success stories are: oil palm and coconut research in the Ivory Coast, hybrid maize research in Zimbabwe and Kenya, research on groundnuts in Senegal and Nigeria, rubber and oil palm research in Malaysia, research on hybrid cotton in India, and wheat research in Mexico.

These successes came from concentrating human and financial resources on a limited number of commodities, teamwork, continuity of scientific leadership, stability of funding, and a congruence of research and development objectives.

**Conclusion: Strong national research systems are needed.** Whether primarily generating or adapting technology, NARS must be strong institutions if they are to contribute effectively to agricultural development.

## ISNAR -- The CGIAR response to strengthening NARS

Assisting NARS to strengthen their scientific capacities for

generating and adapting technology has always been a central objective of the CGIAR.

Recognizing that technological development must be complemented by institutional development, the Consultative Group on International Agricultural Research (CGIAR) -- an informal association of donors, and representatives of developing countries, which supports the system's thirteen international agricultural research centers (IARCs) -- created ISNAR. Such a service was needed.

Assisting NARS to strengthen their scientific capacities for generating and adapting technology has always been a central objective of the CGIAR. Initially, emphasis was placed on helping NARS develop cadres of first-rate research scientists and technicians. The international agricultural research centers (IARCs) of the CGIAR provided training and opportunities for collaborative research, and helped disseminate scientific knowledge through conferences, publications, and information networks.

Scientists cannot contribute to their fullest potential -- no matter how well trained -- without strong institutional support.

Gradually it became apparent, however, that developing scientific capacities in NARS addressed only part of the problem. Organizational and managerial weaknesses were seriously holding back the productivity of the research systems. Scientists cannot contribute to their fullest potential -- no matter how well trained -- without strong institutional support.

Beyond their scientific knowledge and expertise, they need adequate resources and facilities, efficient mechanisms for planning and reviewing their research programs, and the means to interact with the scientific community to remain current with developments in their fields. A strong and productive NARS requires:

- \* a coherent research policy designed to meet national development goals;
- \* an organization compatible with the objectives and functions the government assigns to research;
- \* an integrated set of management processes allowing the system to effectively mobilize and use the required resources -- manpower, investment and operating funds, and facilities;
- \* the ability to communicate effectively with its clientele, its partners (the scientific community), and the country's policymakers.

What was lacking in many NARS was a planning capacity to effectively utilize assistance.

The importance of strong research technology-generating capacity at the national level was fully accepted by the international community -- as reflected by important flows of resources toward the NARS. What was lacking in many NARS was a *planning* capacity to effectively utilize this assistance. They need an independent advisor -- free from political, financial, commodity, and other biases -- to work with them on a partnership basis, over an extended period of time, to create an appropriate institutional basis for productive research. The CGAR came to view institution-building support to national systems as an essential complement to its efforts in generating improved technologies for sustainable food production. The success of the CGAR depends on the strength of its partners -- the NARS.

In response to these recognized needs, a group of CGAR donors, meeting in Munich in the spring of 1976, called for establishing "an international service with the task and purpose of strengthening agricultural research in developing countries... operating in full cooperation and supplementary to existing and related programs of the FAO and other organizations."

ISNAR was created in 1979 as a service to advise and assist national systems in strengthening their capacities to effectively and efficiently use their resources.

A 14-member task force, composed of representatives of national agricultural research systems from the developing and industrial countries, donor institutions, and the IARC's, reviewed the needs of the developing countries' research systems and how well they were being served. The task force concluded that a service was needed. In 1979, after three years of careful study, the CGAR founded ISNAR as a service to advise and assist national systems in strengthening their capacities to effectively and efficiently use their resources.

### **The concept of a service to national systems**

The concept of such a service to NARS was innovative and unprecedented. Similarly, the institution developed to meet these objectives is unique. ISNAR is distinguished by several features which, when united, form the basis of its comparative advantage as a service to NARS.

First and foremost, ISNAR is a service. It works in partnership with national systems; it explicitly serves their needs, interests, and aspirations.



ISNAR is fulfilling an essential role, complementary to other global efforts to stimulate agricultural development.

In its service to NARS, ISNAR takes a multidisciplinary approach. It integrates its knowledge and expertise of agricultural research, organization and management sciences, and developing countries. The systematic integration of these diverse perspectives distinguishes ISNAR's approach from other research and development organizations.

ISNAR supports its service to NARS with a strong research capacity. Research is needed to systematically synthesize knowledge and experience gained through collaboration with NARS in system-building. It is also needed to develop and adapt concepts, tools, and analytic methods in research management that are relevant to developing-country situations. Research at ISNAR can best be thought of as "action" research; it has a clear problem-solving focus, it is closely integrated with ISNAR's advisory services and training activities, and it is carried out in close contact with the national systems.

ISNAR is an independent advisor. As an international center within the CGIAR, it is recognized as an organization which can make recommendations, unbiased by donor policies and insulated from national or regional political pressures.

Finally, like the other centers of the CGIAR, ISNAR's mandate is clearly focused. ISNAR concentrates its efforts on research policy, organization, and management — the three areas critical to building efficient and effective research systems. It, thus, has the concentration of effort required for impact.

All of these features distinguish ISNAR and the nature of the service it provides to NARS. Although it is a small institution, it is fulfilling an essential role within the CGIAR, complementary to other global efforts to stimulate agricultural production in such a way that the nutritional level and general economic well-being of low-income people are improved.

### ISNAR's evolution during its first five years

When ISNAR was created and began operating in 1980, the concept of a service to NARS was new and untested, and the field of agricultural research management in developing countries was young. Its founders, therefore, established ISNAR on a trial basis — it was given five years to define its program and priorities, establish principles for collaboration with NARS, and develop its analytic methods and operational approach.

In its early years ISNAR was breaking new ground. It had a broad mandate but no specific guidelines. It had to learn by doing. After recruiting a highly qualified staff with extensive experience in agricultural research management in developing countries, ISNAR moved ahead vigorously to test various approaches to working with NARS and fulfilling its mandate. It worked with a broad range of countries, dealt with diverse problems, and experimented with different analytic methods and modes of collaboration.

ISNAR completed its trial period in 1985. At that time, external review teams, overseen by the CGIAR's Technical Advisory Committee, examined ISNAR's program and management, and assessed its accumulated experience. They concluded that the concept of a service to NARS was viable, and that ISNAR had succeeded in developing the institutional capacity to carry out its mandate. On the basis of the review recommendations, the CGIAR confirmed ISNAR as an IARC with continuing membership in the CGIAR.

ISNAR began a new phase of its institutional life in 1986. Its strategy guides its response to challenges which lie ahead.

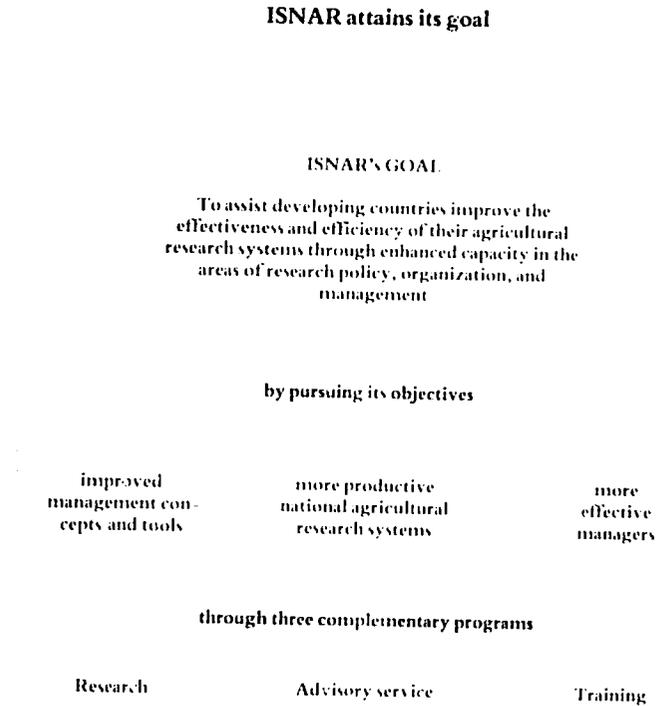
ISNAR began a new phase of its institutional life in 1986. It moved with greater confidence in fulfilling its mandate. The confidence was born out of the new strategy which its staff developed during the year. In developing its strategy, ISNAR critically analyzed its past experience and understanding of the needs of the evolving national agricultural research systems. Its systematic analysis and synthesis of accumulated experience helped it more clearly define its program, functions, and methods of collaboration with NARS.

ISNAR's strategy guides its response to the challenges which lie ahead in further developing its program, responding to countries' requests for assistance — maximizing the impact from its limited resources — and ensuring the relevance of its program to the priority needs of national systems.

## Chapter 2

# ISNAR'S STRATEGY: HELPING TO BUILD EFFECTIVE NARS

*Figure 1.* The relationship of ISNAR's three programs and their objectives to the ISNAR goal.



### ISNAR's goal

ISNAR's strategy sharpens the focus and clearly defines the contents of its programs. It emphasizes activities and products required to build strong national systems, and is designed to meet ISNAR's goal, which is:

To assist developing countries improve the effectiveness and efficiency of their agricultural research systems through enhanced capacity in the areas of research policy, organization, and management

The goal reflects the needs of national agricultural research systems, ISNAR's mandate as a service organization, and its role within the CGIAR.

The critical elements of ISNAR's goal are *effectiveness and efficiency*. Effectiveness refers to the relevance and impact of research. To be effective, a NARS must generate, in an efficient manner, that combination of research solutions which is most appropriate to its country's development objectives and needs.

Efficiency is essential to the long-run productivity of the research system. To be efficient a NARS must attain the highest research output possible from the combination of resources and knowledge at its disposal.

## ISNAR's programs and objectives

ISNAR has defined three distinct and interrelated programs — with objectives for each — aimed at achieving its goal:

### **Advisory service program.**

Objective: To support NARS in their system-building efforts to strengthen their performance and contribute to national agricultural development.

### **Research program.**

Objective: To develop improved concepts, tools, and analytical methods appropriate for developing countries' use in the areas of research policy, organization, and management.

### **Training program.**

Objective: To help NARS leaders and scientists develop their management and analytic capacities.

In developing these programs, ISNAR was guided by its projection of future demand for its services and its capacity to respond effectively to that demand. It took account of national systems' requests for specific services, the need to enhance its research capacity in support of its services, and the need to broaden its impact through training.

## ISNAR's advisory service program

*Figure 2.* Steps normally taken in its collaboration with NARS by ISNAR's advisory service program.

### **Determine conditions and prospects for collaboration**

Assess request against ISNAR's priority considerations

Collect existing data on the NARS and country

Country and ISNAR agree on approach to ISNAR's involvement

### **Diagnose system constraints and potential solutions**

Conduct a comprehensive review of the research system

Determine key constraints to development

Identify potential solutions and framework for a system-building strategy

### **Plan a system-building strategy to resolve constraints**

Define specific measures to address constraints

NARS leaders and ISNAR collaborate in designing plan

Recommendations are supported by ample evidence

### **ISNAR and NARS collaborate in implementing the plan**

Country and ISNAR agree on the nature of their collaboration

Plan may be developed into projects for donor support

Collaboration is adjusted to country's evolving needs and the fit of ISNAR's products

ISNAR's advisory service to national systems — its central thrust — focuses on collaborative system-building activities requested by national governments. Under this program, ISNAR works directly with NARS, either individually or in groups sharing common problems, to strengthen their capacities in research policy, organization, and management.

While modes of collaboration vary according to specific country circumstances, in general, ISNAR proceeds through a three-stage process in its partnership with national governments: diagnosis of system constraints, planning system-building strategies, and implementation of system-building programs.

**Diagnosis of system constraints** involves analyzing the strengths and weaknesses of a system. This may entail a broad-based system review or, in cases where the system has already been adequately studied, a review of specific management processes, policy, or aspects of organization and structure.

ISNAR uses a systems perspective in analyzing a NARS, considering the entire complex of institutions in the country which are involved in generating agricultural technology. By doing so, ISNAR's recommendations take more fully into account all the resources available for strengthening the NARS.

The products of this analysis are: 1) the determination of key constraints and, 2) identification of potential solutions. It provides both the rationale and a framework for designing a system-building strategy.

Planning system-building strategies includes defining the specific measures required to address the constraints identified in the review.

**Planning system-building strategies** includes defining, in operational terms, the specific measures required to address the constraints identified in the review. National research leaders participate fully in developing these strategies.

The product of this process is a specific strategy or plan of action, the scope of which varies from system to system. The strategies range from broad-based recommendations for making changes in the system's structure, to precise measures for improving specific components of the management process. They set clear priorities among the recommendations and define the appropriate sequence for implementing them. In procedural terms, this step is often combined with the system review.

In all cases ISNAR considers the system's specific needs and helps develop recommendations which are specific enough to be implemented. Further, to be convincing to policymakers, these recommendations must be clearly argued and supported by adequate evidence.

**Implementing system-building programs** often involves intensive, long-term collaboration between ISNAR and the individual NARS, resulting in an incremental build-up of the national system's capacities and expertise within specific system components — and greater coherence between them. The product of the implementation stage is more-effective and better-managed research systems.

The NARS may design projects for external donor support in implementing specific steps in the system-building plan. In such cases, ISNAR assists in preparing a framework from which the NARS may subsequently develop the project proposals. In general, as these projects move into the implementation stage, the country takes the lead, ISNAR provides support.

ISNAR may assist a NARS by identifying appropriate management strategies, adapting management procedures which have been successful in other NARS, and cooperating in institutionalizing such procedures. It may act as an intermediary in developing relationships between NARS and specialized management and training institutions in other countries, or for getting help in

areas in which ISNAR does not have sufficient expertise. Complementary activities may also include ISNAR's assistance in monitoring and evaluating progress.

### ISNAR's research program

Figure 3. An overview of the need for and products of ISNAR's research program.

**ISNAR's service requires up-to-date knowledge of NARS**

For adapting management techniques for NARS' use

For developing training program materials

For implementing NARS system-building strategies

**coming from the knowledge base of its research program.**

Generating quantitative information about NARS

Analyzing the state of NARS in a comparative framework

Identifying and quantifying NARS common constraints

**Its research program develops practical tools for NARS,**

By conceptualizing management issues facing NARS

By synthesizing its experience and management literature

By adapting management concepts for NARS' use

**maintains ISNAR's in-house diagnostic capacity,**

For diagnosing NARS' management problems

For borrowing and adapting management techniques

**and conducts in-depth studies on priority issues**

Responding to urgent needs of NARS,  
their donors, or the CGIAR

Research is essential to ISNAR's maintaining its capacity to provide an effective service to NARS. Once a national system begins to implement the recommendations of ISNAR reviews and planning exercises, it often requests assistance in strengthening specific components of its management. The improved management approaches and tools that are needed are often products of the research program.

All of ISNAR's research is of an applied nature, designed to directly and indirectly serve NARS.

All of ISNAR's research is of an applied nature, designed to serve NARS *directly* through increased knowledge and understanding of the ways they function, and *indirectly* through contributions to ISNAR's training and advisory service programs. It focuses on four types of activities:

**Development of a knowledge base on NARS.** This includes both building up ISNAR's knowledge base about NARS -- comparing one country's experiences with others and gaining insights from their experiences -- and developing enhanced management tools and concepts in the critical issues which NARS face in the areas of research policy, organization, and management.

Developing this in-depth understanding includes identifying common constraints shared by NARS, developing or adapting analytic methods to

evaluate the specific problems, and generating improved management tools for research leaders' use in strengthening their systems. In addition, ISNAR maintains a global data base on national agricultural research systems, and up-to-date information on developments in related fields.

Developing this knowledge base is an activity central to ISNAR's mandate, provides inputs to its service and training activities, and is directly usable by other NARS and the development community.

**Development of improved management concepts and tools.** In developing practical tools and guidelines for improving agricultural research management in developing countries, ISNAR conceptualizes the management issues facing NARS, synthesizes its own experience and the management literature, and adapts management concepts for NARS' use. It uses an interdisciplinary and problem-solving approach, and promotes the growth of agricultural research management as a discipline.

The focus is on management constraints facing NARS.

The focus of this activity is on the individual management constraints facing NARS, and how to analyze and solve them. The outputs of this activity — consisting of diagnostic approaches, guidelines for improvement, and adapted management tools essential to advancing the effectiveness of ISNAR's advisory service program — are designed to be used directly by NARS leaders.

The integration of the research, training, and advisory service programs takes place at the country level in transmitting these improved approaches to NARS professionals.

**Build-up and maintenance of ISNAR's in-house diagnostic capacity.**

This includes synthesizing ISNAR's accumulated knowledge and experience in the critical areas of research policy, organization, and management; keeping abreast of professional and academic developments in the field; identifying materials which can be developed into training aids; and knowing sources of specialized assistance to NARS.

In this activity, ISNAR borrows and adapts management techniques. Its focus continues to be interdisciplinary and problem-solving, and is still on particular management problems. Every management issue is important to strengthening NARS — in the same way that all crops are important in a cropping system.

**In-depth studies on priority issues.** The fourth type of research program activity involves in-depth analysis of priority issues, and may look at total systems or be focused on particular system constraints. This research is essentially distinguished by the intensity of development of the issue under study and the nature of the product. It may involve applying new disciplinary perspectives to common problems, developing new analytic methods and approaches, or formally testing hypotheses about NARS management.

Because of its linkages with NARS and universities, ISNAR is well situated to perform these types of research.

Such research may involve: a) in-depth analysis of a theme developed by an ISNAR working group as a high-payoff research area; b) research which responds to critical backstopping needs of advisory services; c) response to requests from clients, donors, or the CGIAR for analyses which fall within ISNAR's particular competence; and d) opportunities to do short-term research with promise of high payoff to ISNAR and its work. The output of such research, in its published form, is directly useful to NARS and the development community at large. Because of its in-house information and knowledge, its close involvement with national systems, and its linkages with universities, ISNAR is uniquely situated to perform these types of research.

## ISNAR's training program

Figure 4 An overview of ISNAR's training program activities

### **ISNAR'S training program activities**

Help NARS professionals develop additional leadership and management skills

Disseminate its knowledge and techniques to a broad audience

Effectively and efficiently complement its advisory service

### **include planning and delivering courses and workshops**

Reaching different research sector audiences

Delivering diverse types of training

Focusing on agricultural research policy, organization, and management issues

### **with training materials ISNAR has developed,**

Identifying training needs

Selecting/preparing appropriate case studies and readings

Converting research output into training modules

### **and conducting in-house training**

To NARS managers, through a fellowship program

As an outgrowth of advisory service collaboration

The training program assists NARS professionals develop additional leadership and management skills.

The training program assists NARS professionals develop additional leadership and management skills. In young and expanding systems, management is often in the hands of young scientists who have risen to positions of authority without a long period of learning management skills, "on the job", as is the case in older, more established systems.

Consequently, training in research management approaches and tools saves a system considerable time – and potential losses – in developing the critical mass of research managers needed for the system to function efficiently.

ISNAR's training program is one of the key mechanisms through which it disseminates its accumulated knowledge and techniques to a broad audience. Training, along with publications, constitutes an essential multiplier of ISNAR's impact. By teaching a relatively large number of people in a concentrated period of time, training is an effective and cost-efficient complement to ISNAR's service to NARS.

In addition to direct training of NARS managers, ISNAR's training program provides many necessary inputs so that national systems themselves – or other regional or national training institutions – can carry out research management training. Largely through its training materials and work with individual staff members, ISNAR helps strengthen the training capacities of local institutions. Framing of the trainers has always been an objective of ISNAR's training events.

The training program pursues three activities in particular:

**Planning, organization, and execution of courses, workshops, and seminars.** ISNAR reaches differentiated audiences within the agricultural research sector through its training and workshop program. Training is aimed at three target groups – policymakers, senior management people, and middle-level administrators. The training program organizes and carries out, in collaboration with NARS or groups of NARS, diverse types of training events targeted at the various clients. These include national, regional, or inter-regional (global) courses, workshops, seminars, and conferences.

Global workshops and seminars, drawing participants from all parts of the developing world, are designed to bring NARS leaders and policymakers together.

Global workshops and seminars, drawing participants from all parts of the developing world, are designed to bring NARS leaders and policymakers together with experts who can facilitate an interregional exchange of perspectives on key issues facing agricultural research systems. They may be issue-oriented – focusing on agricultural research policy, organization, and management – and/or they may test recent management approaches developed by ISNAR, thereby ensuring that its products have wide adaptability and a broad potential impact.

Regional workshops focus on common constraints faced by systems which, for geographical or historical reasons, have lessons to share. In adapting training materials to particular regions, ISNAR collaborates with specialists from the region, thereby strengthening their management capacities.

National-level workshops are most useful in providing targeted support to the work of ISNAR's advisory service program. They tend to focus on particular constraints faced by national research managers, and transmitting skills needed to resolve these problems. National-level events are essential to developing a critical mass of research managers who use the same concepts and vocabulary, thus becoming mutually supportive in their efforts to improve the system.

**Development of training materials.** ISNAR's training program supports the dissemination of lessons gained from its experience with NARS, and its research into critical research planning and organizational behavior issues. In both areas, developing training materials involves identifying needs; assembling and/or producing materials, including training cases and exercises, simulations, audio-visuals, lectures, and readings; and converting research output into training modules.

Such materials need to be generic and of wide applicability. In other words, they should be usable not only by ISNAR, but also by regional and national training institutions. They should be specific enough for use in regional and national contexts, while at the same time being flexible enough to be adapted for use in other parts of the world. Adapting standard organizational behavior material for particular regional audiences is part of the task. ISNAR's own experiences are increasingly the most fruitful source of cases and illustrations.

ISNAR initially uses its training materials and approaches in its own workshops and training events in collaboration with NARS. Frequently, participants from national training institutions participate, and later work with ISNAR staff. Through their local adaptation of the materials, they increase the impact of ISNAR's work, and the activity contributes to training the future trainers.

**In-house training.** As an outgrowth of collaboration in advisory services, ISNAR provides in-service training at its headquarters to a limited number of NARS managers seeking specialized assistance through interaction with ISNAR staff on issues in which ISNAR is strong.

Such in-house training usually requires a predefined product and effectively integrates the training, research, and advisory service functions. This will grow into a fellowship program in line with the availability of in-house materials and supervision.

## **Integration of ISNAR's programs**

Although each program is focused on a specific objective,

ISNAR attains its goal through their integration.

ISNAR's advisory service works with NARS to build more productive systems; research develops tools and techniques for more efficient management; and training helps research managers become more effective.

Although each program is focused on a specific objective, ISNAR attains its goal through their integration. For example, the products of the research program are used by advisory services in their work with NARS to strengthen particular management components. Feedback from national systems through the advisory service ensures that research remains relevant and focused on high-priority issues.

The three programs complement each other. The advisory service program's intensive collaboration with NARS in system-building efforts usually requires a long-term commitment. The products of ISNAR's research and training programs — publications and management tools, as well as workshops and training courses — allow ISNAR to reach a broader audience and multiply its impact.

While recognizing their interdependence and complementary functions, ISNAR views advisory services, research, and training as distinct programs. Each program has its own specific objective, entails a distinct style of operation, requires different skills and professional expertise, and generates a unique set of products. Thus, they have particular planning, staffing, and management requirements.

The overall integration of ISNAR's programs, activities, products, and objectives, their relation to ISNAR's goal, and thence to the objectives and goal of the CGIAR, are diagrammed in Figure 5. (See pages 20-21.)

## Chapter 3

# ISNAR'S STRATEGY: ADDRESSING TWELVE CRITICAL FACTORS

ISNAR, based on the systematic review of past experience and accumulated knowledge, has delineated a set of 12 critical factors which determine the effectiveness and efficiency of a NARS (Figure 6).

The factors fall within the broad areas of research policy, organization, and management. They represent the essential components of a strong research system, and are interrelated and mutually reinforcing. Deficiency in any one of these factors affects capacities in the others and inhibits the system's development of its fullest potential. They are, thus, the critical points of intervention in a system-building strategy, and the focus of ISNAR's work.

Each factor is a key topic, or theme, which cuts across and integrates ISNAR's three programs -- advisory service, research, and training. In this way they comprise the content, or substance, of ISNAR's program. Developing the capacity and expertise to assist NARS in the build up of each of these critical areas is the central thrust of ISNAR's strategy for program development.

## Critical factors in building effective NARS

*Figure 6. Critical factors determining the effectiveness and efficiency of a NARS.*

### **The policy context of agricultural research**

- Interactions between national development policy and agricultural research.
- Formulation of agricultural research policy: priority setting, resource allocation, and long-term planning.

### **Structure and organization of agricultural research**

- Structure and organization of research systems.
- Linkages between NARS and policymakers.
- Linkages between NARS, the technology transfer system, and users.
- Linkages between NARS and external sources of knowledge.

### **Management of agricultural research**

- Program formulation and program budgeting.
- Monitoring and evaluation.
- Information management.
- Development and management of human resources.
- Development and management of physical resources.
- Acquisition and management of financial resources.

## Policy context of agricultural research

Research policy determines how many and what kinds of resources are available to the research system, how they are allocated, and how research priorities conform to national development objectives. An unfavorable policy environment limits the research system's contributions to national agricultural development objectives.

Problems occur at two levels -- at the national policy level and the research policy level. Each is an important factor influencing the productivity of the research system.

### **Interactions between national development policy and agricultural research**

National development policy defines research objectives and determines the level of resources allocated to research.

National development policy defines research objectives and determines the level of resources allocated to research. Yet, there is often inconsistency between the objectives fixed for agricultural research, policies designed to realize these objectives, and the level of resources allocated to research. Recent ISNAR data show declining rates of growth in national support for agricultural research in real terms, at the same time that governments are placing increased emphasis on agricultural development.

Often the interaction between development policy and research is top-down, with policy dictating the broad research agenda. However, NARS can and should have an impact on national policy as well. They have an important role to play in helping policymakers make more realistic appraisals of the potential of research to contribute to agricultural development objectives. For example, NARS leaders can define the production potential of agro-ecological zones, contribute to natural resource planning, assess the feasibility of agricultural development plans, and define the expected returns to different kinds of research activities.

Further, they can provide information to help policymakers establish priorities among competing development objectives: import substitution or export promotion, cash or subsistence crops, small- or large-scale farming, and low- or high-input production.

Unfortunately, this role in support of policymakers is rarely fully developed in NARS. In order to collaborate effectively, NARS need strengthened capacities in socio-economic analysis and planning.

### **Formulation of agricultural research policy: priority setting, resource allocation, and long-term planning**

Formulating research policy is a key step in translating national development objectives into a research program.

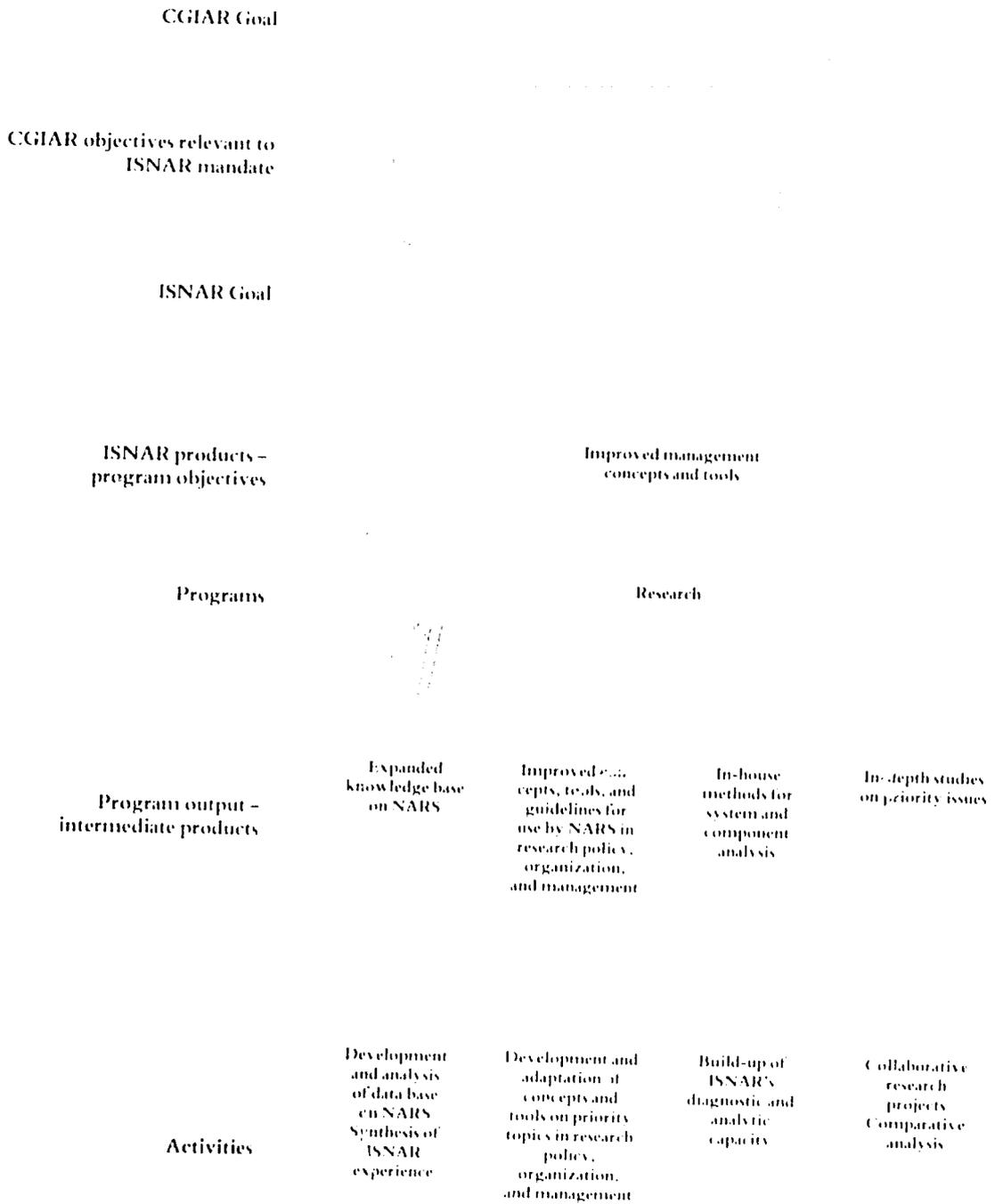
Formulating research policy is a key step in translating national development objectives into a research program. This interdisciplinary and interinstitutional process involves making difficult decisions regarding research strategies and priorities, and the level of support given to specific commodities or regions. The lack of clearly formulated research policies and plans often results in fragmented research programs -- only superficially linked to development objectives. They lack orientation and coherence, and are vulnerable to external donor pressures.

Effective mechanisms for planning and priority setting are particularly important for resource-poor countries. They cannot afford to carry out research on all commodities or in all regions. Since research priority choices can have a major impact on agricultural development, they need clear choices on research strategies and priorities to guide the allocation of their scarce resources.

Setting research priorities and allocating resources to meet defined development objectives is a complex process. It involves carefully assessing such factors as:

- \* the economic, social, and political importance of commodities, regions, or client groups;
- \* the current and projected demand for commodities;
- \* the likelihood of a research breakthrough;
- \* the resources and time required to carry out a research program;

Figure 5. The integration of ISNAR's program and its relation to the CGIAR goal.



**Contribute to increasing sustainable food production in developing countries**

- Strengthening national research capacities
- Improving the policy environment
- Strengthening the integration of efforts

To assist developing countries to improve the effectiveness and efficiency of their NARS through enhanced capacity in the areas of research policy, organization, and management

More productive national agricultural research systems

More effective managers

Advisory services to NARS

Training

Analysis of NARS' strengths and weaknesses

System-building strategies  
Long-term plans  
Designs for system-building projects

More effective structures  
Improved organization  
More efficient management processes

Training materials

Dissemination of knowledge and development of management skills

Collaborative build-up of research management expertise

Diagnosis:  
System review  
Constraint analysis

Planning:  
• Designing system-building strategies  
• Developing long-term plans  
• Formulating system-building programs/projects

Implementation:  
• Collaboration in strengthening organization and management components  
• Adaptation and application of improved management tools  
• Specialized advice on priority topics

Development of training materials

Formal training:  
• Planning, organization, and execution of training courses, workshops, and seminars

Informal training:  
• In-house training  
• Fellowship program

- \* probability of adoption of new technology,
- \* the probable distribution of benefits within the society.

Once priorities are determined, a long-term plan for developing human, physical, and financial resources can help ensure continuity in research, adherence to established priorities, and rational development of resources. A long-term plan helps to maintain research priorities and define research agendas more realistically than can be done through annual programming alone. It can also provide a framework for soliciting donor contributions and using them most effectively.

Relevant tools to assist NARS in formulating rational research policies are lacking. The approaches designed for use in developed countries' research systems – which assume stable economic structures, free markets, and reliable price signals – must be significantly adapted before being used in developing countries, where these basic assumptions often do not apply.

ISNAR's research programs is developing and refining tools to help NARS formulate rational research policies and long-term plans. The key for developing countries is approaches which allow for increased rigor in decision making, but do not impose unrealistic costs for collecting and analyzing data.

## Structure and organization of agricultural research

A country's national agricultural research system, in a broad sense, includes all those organizations and institutes involved in agricultural research. A system's structure and organization includes its internal organizational structure, as well as its external linkages with its environment. These linkages guide the system and channel the flow of information, products, and resources into and out of the system.

Structure and organization shape the way the system operates and its capacity to achieve its designated objectives.

Structure and organization are critical factors determining the effectiveness and efficiency of a NARS. They shape the way the system operates, and its capacity to perform its assigned function, and achieve its designated objectives.

Several organizational arrangements are found in NARS of the developing world, each with distinctive strengths and weaknesses, depending on the country context. Experience has shown that there is no organizational model that is best for all NARS. The most suitable structure and organization for any particular NARS depend on a number of factors: the objectives and functions assigned to the NARS, the size of the country and its research system, the level of resources committed to research, the state of development of the agricultural sector and its relative importance within the economy, and the country's traditions of administration and financing.

Organizational arrangements are also dynamic; they have to change, often dramatically, to meet emerging technological needs and changing social, economic, and political circumstances. Many developing countries in recent decades have instituted major structural changes – upgrading the status of their research services – to make research more responsive and committed to the needs of agricultural development. Examples are the semi-autonomous research institutes and emerging private foundations in Latin America and the agricultural research councils in Asia.

To help NARS make the right choices, ISNAR is developing comparative information on the advantages and disadvantages of specific organizational models, and their interaction with the environment.

## Structure and organization of research systems

Structure and organization of research systems refer to the institutional arrangements and mechanisms for mobilizing human, physical, and financial resources, and information at all levels of the research system. Specifically, it includes the size of the research system, and the number and types of research institutes, the institutional responsibilities and mandates, the system's communication and collaboration practices, and the internal organization of research within individual institutes and experiment stations.

Structure and organizational issues are critical to improving the national system's effectiveness and efficiency.

In nearly every country with which PNAR has collaborated, structural and organizational issues have been critical to improving the national system's effectiveness and efficiency, making it accountable to the national program of economic development.

These issues are particularly important in countries which have inherited research systems from an earlier colonial era. The size and organization of these systems are often incompatible with the independent nation's development objectives and available resources. Resource allocation can become seriously imbalanced as countries struggle to maintain a large infrastructure of research stations and laboratories, while remaining short of funds to pay scientists adequately or provide them with basic operating funds for carrying out research.

Effectively integrating externally funded research activities is another organizational issue confronting many developing countries. Donors are playing an increasingly important role in national agricultural research. While their support is clearly desirable, a strong donor presence can also be disruptive when projects are run essentially as autonomous research efforts.

To avoid these problems, donor-assisted activities must be integrated into and made compatible with the organization of the NARS. This requires strong initiatives from NARS leaders and donors alike, and may require major structural and organizational changes to rationalize the systems so that resources are used most effectively to meet national objectives.

ISNAR's concentration on this factor increases its knowledge about the relative advantages and disadvantages of different organizational structures at both the system and institute levels, reinforcing its capability to make recommendations for structural changes.

## Linkages between NARS and policymakers

An effective exchange of information between NARS leaders and policymakers is critical in building strong national systems. NARS leaders can stimulate increased research funding if they can successfully communicate the potential of research in contributing to agricultural development. Conversely, by collaborating with research managers and clearly articulating national and agricultural development objectives, policymakers can help improve the relevance of research priorities and plans.

The structural communication linkages between NARS leaders and national policymakers are an important determinant of the quality and intensity of their interaction. They do not, in themselves, guarantee collaboration, but they do help to define roles and responsibilities.

## Linkages between NARS, the technology transfer system, and users

A NARS is successful only if the knowledge it produces can be translated into

A NARS is successful only if the knowledge it produces can be translated into improved technologies which farmers are willing and able to adopt.

Improved technologies which farmers are willing and able to adopt. This depends on effective interaction between the technology-generating system (research) and the users of technology (extension services, development agencies, and farmers).

Such interaction increases the relevance of the research output by letting scientists know what kinds of problems need their attention and increases their efficiency in identifying problems, setting priorities, evaluating technologies, and identifying non-technical constraints to the adoption of new technologies.

Reducing the technology transfer gap involves creating formal institutional mechanisms for linking the research system with extension, to convey information to farmers and other users of technology. Cutting research results to farmers facilitates their adoption of new technology, gives them more production options, and stimulates agricultural development.

Despite their importance, these linkages are often weak in NARS. This is a difficult constraint to resolve, and the structure and organization of the research system is a key factor shaping the nature and quality of the linkages.

Research managers have requested that ISNAR further develop guidelines for improving the incentives, organizational arrangements, and means for close interaction between research, extension, and farmers. Such mechanisms include on-farm research; appointing extension liaison officers; involving representatives of farmer organizations; and extension representation on experiment station research committees.

### **Linkages between NARS and external sources of knowledge**

Since national agricultural research systems are an integral part of a global research system, they can increase their efficiency and maximize the impact of their limited resources by making full use of all available sources of knowledge and information.

To do this, and avoid fragmentation of effort, NARS must communicate effectively with other NARS, their local and foreign universities, specialized institutions, and the international agricultural research centers. These external linkages are particularly important for small countries with limited research capacities.

Related issues are: the demands these linkages place upon national systems' resources; the effectiveness of the linkages; and the NARS' capacities to absorb and use information.

### **Management of agricultural research**

A set of six basic management processes influences the effective and efficient operation of any system.

A set of six basic management processes influences the effective and efficient operation of any system -- they determine how well the research system functions; the way scarce resources are managed and used; and the system's ability to develop effective and relevant programs.

The first three factors -- program formulation, monitoring and evaluation, and information management -- relate to managing the research process itself. They are necessary for building strong and relevant programs. The other three relate to developing and managing the systems' resources -- human, financial, and physical. They determine cost-efficiency in resource utilization and effectiveness of output.

These management processes all rely on the availability of adequate and timely

information. They are complementary and interrelated, and must be viewed from a systems perspective. Often the *interactions* among the processes are as important as the processes themselves in determining the effective functioning of a NARS. For example, in many NARS it is the imbalance in the mix of resources, not the lack of any one particular resource, which is the critical constraint to building a strong system.

### **Program formulation and program budgeting**

Program formulation occurs within an established framework of research priorities and resource allocations. It is through this interdisciplinary process at the institute or experiment station level, that identified problems are translated into relevant and researchable questions, specific research approaches are chosen, and available resources are allocated. The desired outcome is a coherent, relevant, and realistic research program, addressing priority problems for agricultural development.

Through formulating research programs scientists make their greatest contribution in the management area.

Through formulating research programs scientists make their greatest contribution in the management area. Only scientists are able to determine the appropriate research approach; and evaluate the potential for technological breakthrough, the probability of achieving success within a given time frame, and the resources required to implement the proposed research. Scientists are responsible for choosing, from among a wide array of possible experiments, those which will form a technically sound and relevant research program.

Many NARS scientists lack the experience and training necessary to evaluate the technical feasibility and budgetary requirements of programs. While improved technical judgement can only be gained through more scientific training and experience, management tools can facilitate relevant and sound program formulation and budgeting.

Adequate and timely information is an essential element of good program management. In developing realistic work plans and budgets, research managers must match available personnel, funds, and materials to the resource requirements of the proposed research program. In many NARS there is no system for collecting or analyzing information for properly doing this.

ISNAR, collaborating with NARS, is developing and refining formal programming and budgeting processes which are as simple as possible, yet sophisticated enough to provide the necessary information in readily accessible form. Management information systems, based on micro computers, are now emerging as an effective tool for improving this process.

### **Monitoring and evaluation**

Monitoring and evaluation provide the means for measuring results; introducing interim adjustments; and generating feedback for future planning.

Monitoring and evaluation are intrinsic to effective research management. They provide the means for measuring results against planned objectives; introducing interim adjustments; and generating feedback for future planning. Since research is a long-term process, they are critical to ensuring program relevance, quality, and optimal resource use. Yet, many of the existing models are resource-intensive and not appropriate for the circumstances of developing countries.

Many national systems are interested in strengthening their capacities in monitoring and evaluation as tools for improved research management, especially in limited-resource situations. New approaches need to be developed for use by national systems which are not unduly time-consuming; do not require collecting superfluous data; give timely analysis, interpretation, and feedback; and are perceived by researchers as useful.

### Information management

The basic products of research are new technology, information, and knowledge. Hence effective information management is essential to any research system. Communication is often difficult in developing-country systems because staff are dispersed among numerous and distant research stations. These conditions result in weak coordination within the research system, duplication of effort, lack of continuity in building the knowledge base and expertise, and inefficiencies which limited-resource systems cannot afford. Investing resources in strengthening information management and communication can have a high payoff for NARS.

As previously noted, data bases and computerized management information systems are becoming increasingly important as management tools for human resource development planning, personnel management, program budgeting, monitoring, and evaluation. They can significantly improve management efficiency by facilitating information storage and handling, and data analysis. To be effective, however, the NARS must maintain the equipment and use it to its full potential. This generally requires developing a small group of trained, specialized staff.

### Development and management of human resources

Agricultural research is above all a scientific activity. To be successful, a research system must develop a cadre of experienced research personnel of appropriate size, disciplinary mix, and educational level. This requires good management. NARS must be able to effectively recruit scientists and technicians, offer them good career prospects and opportunities for further training, and provide them with incentives for achievement as well as a long-term commitment to service.

System reviews have repeatedly identified deficiencies in developing and managing scientific staff as the most important factor limiting NARS' development.

This is a high-priority factor for NARS leaders, and an area in which ISNAR is developing management tools. System reviews have repeatedly identified deficiencies in developing and managing scientific staff as the single most important factor limiting the development of NARS.

ISNAR data show that nearly half of all NARS have less than 5% of their staff holding PhDs. Moreover, staff are often young and inexperienced. This is due, in part, to high attrition rates. In the absence of career incentives, qualified scientists are attracted to better opportunities elsewhere. The best scientists are sometimes the first to leave.

To counteract excessive rates of staff turnover, NARS need to develop incentive structures which allow them to retain their staff and thus develop the critical mass required to perform their functions.

In small-country NARS, achieving a critical mass of researchers is a challenge because the overall number of scientists and managers on the staffs is often small. Even in larger systems in many countries, scientists are spread too thinly among multiple programs, institutes, and stations, hampering the development of such a threshold. In many cases, achieving critical mass requires significantly consolidating the research network. Experience has shown that a few programs, well-staffed and supported, have a far better chance of producing useful results than a widely dispersed system, with its problems of poor communication, intellectual isolation, and lack of support services.

Another important human-resources concern is the lack of adequate operating funds. In recent years, many NARS have been experiencing rapid growth in staff while facing, at the same time, a decline in the rate of growth in their overall budgets. As a result, an excessive share of budgetary resources is allocated to salary payments. In some cases, funds available for operating costs have fallen to

as low as 5% of total resources. The results of this distortion are obvious: low productivity of the system's most precious resource -- its scientific staff -- and low overall productivity of research systems.

ISNAR's efforts focus on recruitment and career planning, human resource development planning, management of training, and conditions of service.	ISNAR's efforts focus on four areas: recruitment and career planning, human resource development planning, management of training, and conditions of service.
ISNAR helps NARS strengthen their capacities in projecting the number and appropriate disciplinary mix of scientists and technicians needed to implement their research program, and to design a training plan for developing this cadre of research personnel. It has a comparative advantage in this area because its interdisciplinary staff includes biological, physical, and social scientists.	ISNAR helps NARS strengthen their capacities in projecting the number and appropriate disciplinary mix of scientists and technicians needed to implement their research program, and to design a training plan for developing this cadre of research personnel. It has a comparative advantage in this area because its interdisciplinary staff includes biological, physical, and social scientists.
ISNAR is also developing methods for analyzing salary structures, career paths, reward structures, incentive systems, and systems of grading and evaluating personnel, to help NARS identify points for improvement and develop appropriate solutions.	ISNAR is also developing methods for analyzing salary structures, career paths, reward structures, incentive systems, and systems of grading and evaluating personnel, to help NARS identify points for improvement and develop appropriate solutions.

### **Development and management of physical resources**

In making decisions as to the type and number of research stations, support services, and equipment, an important consideration is sustainability, over time, from national resources. The recurrent costs of supporting a large infrastructure can be an enormous drain on NARS budgets, often at the expense of human resource development or adequate operating funds.

In many cases, plans for infrastructure development are over-ambitious, and the plant deteriorates when donor support is withdrawn.	Unfortunately, donors have not always sufficiently taken account of these factors. In many cases, plans for infrastructure development are over-ambitious, NARS become over-committed to maintenance, and the plant deteriorates when donor support is withdrawn.
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ISNAR missions frequently recommend consolidating research stations to a reasonable number and spread. Sound planning and management are necessary.

### **Acquisition and management of financial resources**

NARS tend to face four serious problems, all emphasizing the need for increased attention to this factor:

1. inadequate levels of support,
2. instability of funding,
3. poor disbursement of funds,
4. problems in handling the sudden influx of donor funds.

Serious distortions in the resource mix of NARS result in low productivity.	ISNAR data show that about 65% of NARS are facing a decline, in real terms, in their per-scientist financial support. This needs correction. Already noted are the serious distortions in the resource mix of NARS resulting in low productivity, lack of staff motivation, and high rates of attrition as staff leave for more attractive opportunities elsewhere.
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Year-to-year fluctuations in research funding may be as high as 50%. They are particularly detrimental to research programs, given the long-term nature of the research process. To counteract this instability, NARS can consider using alternative or supplementary funding mechanisms. But this is a long-term alternative. Donor funds can also potentially be used to buffer NARS from these fluctuations.

With respect to disbursing and administering funds, two basic mechanisms are important and often lacking in NARS: mechanisms which ensure the timely

delivery of allocated funds; and effective accounting systems providing research managers with relevant, up-to-date information they need for planning, programming, budgeting, monitoring, and evaluation.

Microcomputers can contribute to strengthening financial management, making it more efficient and less time-consuming. However, in some cases, fundamental organizational changes are also needed to provide system managers greater institutional autonomy in financial management, allowing for block-funding, carryover of funds from one year to the next, and the release of funds to meet peak requirements.

With the substantial increase in support to agricultural research from donors in recent years, NARS have had to develop management mechanisms to deal with the sudden influx of large amounts of donor funds. There has not always been adequate capacity within the NARS to handle this increased administrative responsibility. Special accounting and reporting requirements for diverse donor research projects can stretch an institution's capacity and actually encumber, rather than accelerate, the research process. Donors and government officials need to cooperate in standardizing and simplifying procedures, so that the needs of all parties are accommodated.

Improvements in any one of these twelve factors can contribute importantly towards increasing the overall productivity of a NARS.

**Summarizing ISNAR's program content.** This overview of the 12 critical factors (listed on page 18) comprising ISNAR's program content emphasizes three points:

1. National systems face a broad range of issues and problems in the areas of research policy, organization, and management.
2. These issues are complex and interrelated. They require careful and continued attention.
3. Improvements in any one of these twelve factors can contribute importantly towards increasing the overall productivity of a national agricultural research system.

### Areas of ISNAR's program concentration

Because of ISNAR's small size and limited resources, it clearly cannot make a substantial contribution in all 12 critical factors at once. Priorities had to be established, guiding the incremental build-up of capacities in addressing the factors.

ISNAR selected six for priority attention in the near term. They reflect important constraints in NARS, where the demand for assistance is high. They are:

- \* formulation of agricultural research policy, priority setting, resource allocation, and long-term planning;
- \* structure and organization of research systems;
- \* linkages between NARS, the technology transfer system, and users;
- \* program formulation and program budgeting;
- \* monitoring and evaluation;
- \* development and management of human resources.

This selection was based on close consultation with NARS leaders and application of the following criteria:

- \* *The factor must address a constraint frequently limiting the efficient functioning of national systems.* This determination was based on experience gained in working with some 30 NARS over a six-year period and specific consultation with NARS leaders.

- \* *ISNAR must have a comparative advantage in the specific area of concentration or the potential to develop it.* ISNAR's comparative advantage is based on two factors: the integration of expertise of specialists in policy, organization, and management sciences with that of biological scientists having extensive field experience; and its close interaction with NARS and specialized institutions.
- \* *There is reasonable expectation of impact through ISNAR's service to NARS, given the level of investment ISNAR is able to make.* ISNAR is small; therefore, achieving a multiplier effect is essential. It is important to concentrate on topics relevant to a wide range of countries.

In all 12 factors, ISNAR maintains a basic capacity to diagnose problems and recommend solutions, or the means for developing solutions. This is essential for ISNAR's successful collaboration with NARS in system-building. It entails: synthesizing the state of knowledge and ISNAR's experience in the area; keeping abreast of professional and academic developments; identifying materials to be developed into training aids; and developing proposals for in-depth research on issues identified for further analysis. Interdisciplinary ISNAR staff working groups are responsible for maintaining this capacity in each topic.

In the topics selected for priority attention, efforts are further intensified. ISNAR's concentration on these factors combines practical and theoretical approaches to solving problems. It develops the in-house expertise required for providing specialized advice and training in the topic; and focuses on generating training materials and developing or adapting management concepts, analytical methodologies, and tools which can appropriately be applied in developing countries.

### **Program development: The evolving demand for ISNAR's services**

ISNAR's program development strategy is guided by the growing capacities and changing needs of its clients — the NARS.

ISNAR's program development strategy is guided by the growing capacities and changing needs of its clients — the national agricultural research systems. Trends which are likely to affect the way agricultural research is organized and managed — and the nature of the demand for ISNAR's services — include: the evolution of NARS; rapid advances in science; changes in the institutional landscape; changing demands for technology; and advances in the field of organization and management.

**Evolution of national systems** will create new issues in organization and management. One key trend affecting ISNAR's program emphases is the growth in the size and complexity of national systems, as international donors and national governments become more committed to research as an instrument for economic development. Expansion of staff, in particular, and in some cases, infrastructure and resources, is expected to continue. This rapid influx of external resources will test the absorptive capacity of some systems.

Accommodating this growth, and other aspects of the evolution of NARS, will require new organizational arrangements and management processes. These, in turn, will require effective managers to ensure the efficiency and productivity of the research systems.

**Rapid advances in science.** Progress in science and technology has been impressive. For example, recent advances in biotechnology indicate the advent of a new scientific revolution — following the green revolution of the seventies. National systems must gear up to capture the potential of new scientific developments. In some cases, this will require a capacity to conduct basic and strategic research.

More commonly, research systems must be in a position to carry out timely and relevant applied and adaptive research, using these emerging technologies. To do so they will have to strengthen their linkages with the key actors — institutions of higher learning, and the specialized public and private institutions doing basic and strategic research.

The private sector's increasing research activities are likely to have a significant impact on the future development and orientation of NARS.

**Changes in the institutional landscape.** The private sector's increasing research activities are likely to have a significant impact on the institutional development and future orientation of NARS. To benefit from the private sector's expanding research and development role -- rather than trying to counteract its evolution -- NARS will need to institutionalize arrangements allowing them to link with the private sector efforts, ensuring complementarity and rational division of labor.

**Changing demands for technology.** Demand for technology is continuously evolving, and tends to accelerate with success, and resulting growth of incomes in a developing country. Agricultural and economic development bring new patterns of supply and demand. Achieving self-sufficiency in major staple crops is one example. Further production increases may bring the well-known problems of surplus and the resulting need for diversification.

In many countries, especially those with high rates of population growth, technology requirements are becoming more exacting and complex as national systems attempt to address in their research agendas the multiple objectives of improved productivity, equity, employment, and nutrition considerations, as well as the goal of environmental sustainability at higher productivity levels.

Faced with difficult choices, national systems will need to upgrade their capacities to set priorities, develop research plans, and respond flexibly to new developments in the supply of and demand for technology.

Faced with difficult choices, national systems will need to upgrade their capacities to set priorities, develop research plans, and respond to new technology developments.

**Advances in the organization and management fields.** Progress in the management sciences and -- as has been mentioned -- advances in micro-computer technology offer exciting opportunities for providing NARS managers with improved information systems and better management tools. These developments, too, will have an impact on the demand for ISNAR's services by national systems.

**NARS' demands for assistance will continue.** Given these developments, it is clear that the demand from NARS for assistance in building national research capacities will continue, although the pattern of this demand will undoubtedly change. NARS will become stronger and more effective institutions, but the policy issues, organizational demands, and management tasks confronting them will also become more complex. Because levels of institutional development are so variable among national research systems, the opportunities for improvement are also highly diverse. As with technology development, institutional development is a dynamic process. NARS will continue to respond and adjust to evolving needs and changing circumstances. ISNAR will continue to respond and adjust to the evolving needs and changing circumstances of NARS.

### ISNAR's response -- Guidelines for program development

ISNAR's strategy for developing and adjusting its program over the next 10 years, in response to evolving demands, is composed of four main thrusts:

1. Increased specialization.
2. Broadened impact.
3. Strengthened research.
4. Expanded catalytic role.

They will ensure the continuing quality, relevance, and impact of ISNAR's work with NARS.

**Increased specialization.** ISNAR's program focus has been sharpened through working intensively with a wide range of NARS throughout the developing world. Again, emphasis has gradually shifted from broad-based system review and constraint analysis — dominant in the early years — towards a more-focused approach, aimed at solving key problems in NARS and strengthening specific system components.

This shift reflects ISNAR's expanding expertise and capacity, as well as the national systems' growing demand for more specialized services in collaborative system-building efforts. The incremental buildup of ISNAR's considerable knowledge and experience in working with national systems is being supplemented through recruitment of staff with formal training in the organization and management sciences.

Increased specialization will lead to greater depth and quality in ISNAR's service to NARS.

Increased specialization will lead to greater depth and quality in ISNAR's service to NARS. Through more closely integrating its advisory service, research, and training programs — and concentrating its efforts on critical areas and factors in research policy, organization, and management — ISNAR is systematically increasing the impact its expertise and products can have in its collaboration with NARS.

**Broadened impact.** Since ISNAR is small in relation to its task and the demand for its services, it must make optimal use of its limited resources. It aims for a multiplier in its program in order to broaden its impact beyond the resource-intensive approach of direct one-to-one collaboration with NARS.

The key to achieving broader impact is generating and disseminating products which NARS can use in strengthening their capacities, such as methodologies for diagnosing constraints in their systems or assessing performance in specific areas; improved management tools and techniques for strengthening specific system components; and publications which include the latest knowledge on key topics in research organization and management.

ISNAR's research and training programs are keys to its impact-broadening strategy.

ISNAR's research and training programs are keys to its impact-broadening strategy. The research program develops products in the identified areas of concentration, and tests them under the operating conditions of NARS. They are then packaged and sent to a broader clientele through the training program and publication services. Through increased reliance on such products, ISNAR can extend its service to a wider range of NARS.

**Strengthened research capacity.** Increased specialization and broadened impact both rely on a strong research program to advance the knowledge base and generate the required products. This function is critical, since most existing knowledge in the agricultural research management field comes from developed countries' experiences. These experiences cannot be directly transferred — the policy environments, institutional arrangements, and resources available to these research systems are quite different from those of NARS in developing countries. Considerable adaptive research is required to make existing concepts, organizational models, and management techniques relevant to research systems in developing countries.

ISNAR is well-situated to conduct this applied and adaptive research. It is intensively involved in a wide range of activities with different NARS around the world and is acutely aware of their real problems and the feasibility of potential solutions. Further, with its linkages to specialized institutions, it can draw on emerging knowledge in the organization and management fields for synthesis, adaptation, and subsequent application in developing countries.

To maximize the impact of its research efforts, ISNAR is increasing its collaboration with client countries in designing and executing research projects. This ensures greater research relevance, increases the likelihood that research findings will be translated into action, draws on and strengthens the analytical skills of NARS scientists, and permits more efficient use of ISNAR's resources.

**Expanded catalytic role.** ISNAR concentrates on developing its catalytic role, complementing its own efforts, particularly in research and training. Building on its unique position between the national systems and specialized institutions, ISNAR is encouraging the specialized institutions to conduct research, develop management tools, and mount training programs in the areas of research policy, organization, and management which are of high priority to NARS. Associated with this effort, ISNAR is continuing to develop and maintain a global data base as a primary source of comprehensive and up-to-date information on NARS.

### Operational implications of program development

A larger share of program resources -- approximately 20 percent each -- will be allocated to ISNAR's research and training.

The four thrusts guiding program development have operational implications for ISNAR in the medium term. A larger share of program resources -- approximately 20 percent -- will be allocated to ISNAR's research program, supporting the greater emphasis on applied and adaptive research in achieving specialized expertise and generating products relevant for strengthening NARS.

Training will be strengthened as the principal vehicle for disseminating improved management approaches and techniques to a wide range of national systems. It will also receive about 20 percent of the program resources.

Advisory services will continue as the main thrust of ISNAR's service, but the relative share of resources allocated to intensive one-to-one collaboration will decline moderately to permit a more balanced development of all three programs. The impact potential of advisory services will, however, be increased with strengthened back-stopping from the research and training programs.

ISNAR's program development strategy provides a stable framework within which it can continuously adjust its program, staffing, and resource allocations, responding to the changing demands of national agricultural research systems in developing countries.

## Chapter 4 ISNAR'S PROFILE AS A WORKING INSTITUTION

### Its mandate

An important product of ISNAR's strategic planning exercise was refining its mandate. As with other aspects of developing its strategy, ISNAR carefully assessed its five years of accumulated experience in collaborating with NARS, drew on recommendations emerging from intensive consultations with clients, and considered the recommendations of the external program review team.

The scope of ISNAR's functions has been narrowed in its refined mandate, but the breadth of coverage in terms of assisting developing countries worldwide has been reinforced.

ISNAR's refined mandate concentrates activities on its central function -- its service to NARS.	<b>Changes in functions.</b> ISNAR's refined mandate concentrates activities on its central function -- its service to NARS. The broker function has been deemphasized, and the linkage function deleted.
In its approach, ISNAR helps NARS and donors alike by providing a solid basis for dialogue and a rational framework for investment decisions.	In its original mandate ISNAR was assigned three basic functions: a service to NARS, viewed as its central function; a broker function -- serving as an intermediary between NARS and donors to promote bilateral cooperation; and a linkage function, promoting collaboration between the NARS and the IARC's.
ISNAR's commitment to maintaining a worldwide service and a regional balance in its program was strongly reconfirmed.	<p>Regarding the broker function: Engaging in fund-raising activities would compromise the perception of ISNAR as a neutral and independent advisor to NARS. It is essential that NARS take the lead role in fund raising, and in selecting and negotiating with donors. Similarly, donors are independent and fully capable of choosing their partners for cooperative efforts.</p> <p>Rather than serve as a broker, ISNAR is more effective in the longer term in supporting, rather than leading, NARS in their efforts to mobilize funds. ISNAR works with NARS in developing rational research strategies and plans, and identifying projects -- addressing their priority needs -- which are appropriate for external funding. In this approach, ISNAR helps NARS and donors alike by providing a solid basis for dialogue and a rational framework for investment decisions.</p> <p>With respect to the linkage function: Experience has demonstrated little demand for ISNAR's assistance in linking NARS and IARC's, and little enthusiasm for coordinating the centers' activities at the national level. These activities have not been given priority attention either by the national systems or the centers. Their bilateral relationships are reasonably well developed and growing stronger. Moreover, both NARS and the IARC's believe that their collaboration should not depend on an outside coordinator, but rather should be based on bilateral initiatives, the responsibility of those directly involved. ISNAR, therefore, facilitates initial contact between an IARC and a NARS, when it is important to the country's system-building efforts; and assists NARS in using such collaborative relationships more effectively, in line with their interests and priorities.</p> <p><b>Commitment to worldwide service.</b> In reviewing the geographic scope of ISNAR's work, its commitment to maintaining a worldwide service and a regional balance in its program was strongly reconfirmed.</p> <p>The most important consideration is equity. ISNAR was founded on the principle of universality of access; its service is potentially available to any developing country requesting assistance. Moreover, those countries in greatest</p>

need of assistance are not concentrated in any region; they are dispersed throughout the developing world.

The effectiveness of ISNAR's service is a second important consideration. As an international service to NARS, one of ISNAR's principal roles is to analyze and synthesize the wide range of NARS experience in order to distill knowledge, concepts, lessons, and techniques for application across regions and countries. To fulfill this role, ISNAR must work with countries of varying size, resource endowment, cultural background, and level of agricultural development; as well as with NARS which have diverse organizational models, operational processes, and levels of institutional maturity.

Efficiency considerations are also important. Countries of similar size and stages of development in different regions often face similar problems in strengthening their research systems. Lessons can be shared and, in some cases, solutions to constraints can be adapted and transferred from one region to another.

All of these considerations clearly point to the need for ISNAR to remain active in all parts of the developing world. While urgent needs of specific regions may require an immediate response with short-term shifts in emphasis, these cannot be allowed to undermine ISNAR's capacity to serve NARS worldwide over the long term.

### Priority considerations -- responding to country requests

Figure 7. Priority considerations in ISNAR's response to requests for assistance.

#### How ISNAR allocates its resources: Priority considerations supporting a NARS request

##### RELEVANCE to ISNAR's goal and mandate

- The request deals with agricultural research policy, organization, and management issues.
- Improving research policy, organization, or management will relieve constraints in the system.
- Activities contributing to solving the system's problem(s) fall within ISNAR's mandate, capability, and, preferably, its areas of program concentration.

##### EQUITY in selecting countries

- Work with the country promises to alleviate poverty.
- Working with the country maintains a regional balance in ISNAR's work.

##### IMPACT potential of ISNAR's assistance

- Government indicates a high level of commitment in its request.
- Country is politically stable, with a favorable policy environment for research and development, and an adequate socio-economic infrastructure for adopting technology.
- There is a large and relatively important agricultural sector.
- The country possesses at least minimum scientific resources to implement the action requested.
- Donor support, if needed, is likely.
- There are potential spillover benefits to other NARS.

##### EFFICIENCY in performing the service

- ISNAR has in-house expertise available in the problem area(s).
- ISNAR has a comparative advantage in performing the service requested.
- Complementary efforts by other system-building groups are forthcoming.

ISNAR considers countries' requests for collaboration in building their systems against a set of priority considerations. These considerations ensure that all requests are fairly considered; that they are fully in line with ISNAR's mandate and strategy; and that ISNAR's resources are used for maximum impact.

They are not formal criteria for priority assessment. Rather, they are essential points for consideration, capturing the most important elements of the priority-choice problem. When applied by experienced staff, drawing on their informed judgement and combined experience, they provide a useful guide for rational decision-making.

Figure 7 shows the priority considerations ISNAR uses to target its collaboration with developing-country NARS, to determine the intensity of its involvement, and to decide on the duration of its association.

ISNAR uses these priority considerations to ensure that its activities:

1. are relevant to its mandate;
2. reflect equity in its choice of beneficiaries;
3. impact on the largest number of beneficiaries;
4. reflect efficiency in allocating its resources.

The first consideration is *relevance*. The requested activity must fall in the area of agricultural research policy, organization, and/or management. Although ISNAR may identify fundamental development problems that research cannot overcome, it does not act on them. Only activities falling within ISNAR's mandate are considered.

Equity relates to the CGIAR goal to improve the nutritional level and general economic well-being of low-income people in developing countries.

*Equity* relates to the CGIAR goal to improve the nutritional level and general economic well-being of low-income people in developing countries. Other things being equal, ISNAR will work with countries in which improving agricultural research systems can be expected to improve the well-being of large numbers of low-income farmers and consumers.

This criterion has two aspects: an objective consideration of the number of low-income people that can be helped by ISNAR's activity in a given system; and an equitable distribution of ISNAR's work across regions. Poverty exists in all regions of the developing world.

ISNAR's potential *impact* in strengthening NARS leads to considering both the probability of success of system-building efforts, and the domain over which the benefits of this success will be felt.

Assessing the probability of success involves the country's commitment to implementing system-strengthening efforts. ISNAR looks at critical factors in the research environment that are essential to success, such as institutional stability, the degree to which the policy environment is supportive of new technology, and the availability of national and/or donor support to system-building efforts.

Concerning the domain over which benefits from its system-building efforts would be felt, ISNAR chooses activities which will benefit a large number of people — either because the system is large or because a network of systems can be reached at one time — over work with a system which reaches only small numbers of farmers.

However, given the large number of small countries in the developing world, ISNAR's collaboration may result in findings which are applicable to other systems. For that reason, ISNAR looks at the potential "spillover" of its activities to other systems. For example, work with a small system may

generate lessons, or even models, which can benefit other countries in similar circumstances and thereby justify collaboration.

The final consideration is *efficiency* in using its resources. This brings a definite time dimension to its priority decision process. ISNAR can only respond to a limited number of requests from countries, even for help with problems falling within its priority themes. At any one time, through applying its priority considerations, ISNAR attempts to maintain flexibility in responding to country requests by varying the nature of its service and the time frame of its collaboration in order to provide efficient and relevant cooperation.

## Principles for collaboration: ISNAR's operational approach

Previous chapters describe ISNAR as an institution with a clear strategy. Its operational approach is affected by its position in the institutional landscape of international efforts to strengthen NARS.

**Its unique role.** ISNAR fills a special niche in the development community in its ability to make a long-term commitment to assistance, especially with those requiring comprehensive system-building efforts. It bears repeating that institutional change does not happen overnight. Significant changes require that ISNAR be prepared to make that long-term commitment to work with the policymakers, NARS managers, and senior scientists in a country. This usually calls for considerable staff time, continuity in collaboration, and access to a variety of skills over a period of time.

System-building involves more than the transfer of tools, techniques, and procedures.

Where ISNAR management tools and analytic methods will be used, as in the case of program budgeting or human resource analysis, ISNAR will backstop the use of the method, while leaving execution to the NARS. In other words, system-building involves more than the transfer of tools, techniques, and procedures. ISNAR's collaboration involves a learning process – benefiting both the NARS and ISNAR – which makes a lasting impact.

ISNAR's collaboration with NARS can be described as being of *vertical* and *horizontal* intensity.

*Vertical intensity.* In the more advanced systems, ISNAR involvement tends to be relatively narrowly defined, that is, targeted at specific management components which have been jointly identified as requiring a specific effort to strengthen them. Collaboration focuses on testing, adapting, and applying improved management technology – management tools and concepts. In this case, ISNAR's involvement in the country is specific, in-depth, and concentrated over relatively short periods of time.

*Horizontal intensity.* In some less advanced systems, ISNAR's involvement is directed at a broader system-building effort, aiming at the gradual build-up of the overall organizational and management capacity of the NARS. Collaboration may encompass the entire spectrum of the ISNAR agenda over extended periods of time. It may involve periodic visits by ISNAR headquarters-based specialists, or, in other cases, a continuous presence in the country by ISNAR research/management specialists, in addition to the periodic field visits.

The partnership between NARS and ISNAR is established from the beginning of collaboration. ISNAR and NARS jointly plan all activities.

**ISNAR's partnership with NARS.** ISNAR's work with NARS is guided by a set of basic operating principles, which define how ISNAR works in its partnership with NARS.

- \* The partnership between NARS and ISNAR is established from the beginning of collaboration. ISNAR and NARS jointly plan all activities. Together they develop a plan which clearly delineates the division of responsibilities of both partners and a timetable of action for each.
- \* ISNAR's collaboration with NARS is based on self-help. ISNAR assists NARS in their system-building efforts, but the initiative always remains with the NARS.
- \* ISNAR builds on NARS commitment to system-building. ISNAR's collaboration with a country is predicated upon evidence of a genuine commitment to strengthening its NARS. ISNAR will only act in response to a direct and formal request for assistance from a level of government which has the authority and will to effect change. This is necessary to ensure a reasonable chance of success in the complex process of system-building.
- \* ISNAR works with NARS in an advisory capacity. It does not assume direct management responsibilities in the NARS. Nor does it provide technical assistance as a substitute for a weak NARS or lack of national commitment.

ISNAR is a partner in the emerging global research support system. This implies complementarity in its working relationships with other institutions.

**Complementary relationship.** ISNAR has a complementary relationship with other organizations. It is a partner -- although a small partner -- in the emerging global research support system. This implies complementarity in its working relationships with other institutions.

- \* It is a member of the CGIAR system, carrying with it a clear division of labor with the other international agricultural research centers. While the other IARC's focus on developing technology and agricultural products, and IIFPRI focuses on international food policy issues, ISNAR focuses on helping to build the capacities of the national research systems.
- \* ISNAR must use its scarce resources wisely for the benefit of its clients. ISNAR pays careful attention to opportunities for collaboration and/or division of labor with other institutions, such as FAO, Interamerican Institute for Agricultural Cooperation, Winrock International, and universities.
- \* ISNAR's comparative advantage lies in adapting concepts in research policy, organization, and management to developing-country circumstances. That is why it stimulates and encourages universities and the other specialized institutions to undertake -- sometimes with ISNAR's collaboration -- the basic research needed in developing management tools and methods.
- \* Acting as a catalyst, ISNAR promotes collaborative networks among NARS facing common problems. It backstops those networks and assists them in linking with specialized institutions in relevant fields of competence.

ISNAR's comparative advantage lies in adapting concepts in research policy, organization, and management to developing-country circumstances.

### **ISNAR's organizational structure**

ISNAR has organized itself to implement the strategy described herein. The key elements, from an organizational point of view, are:

- \* clearly defined objectives for the advisory service, research, and training programs;
- \* a clear choice of priority themes within the program content areas of agricultural research policy, organization, and management;
- \* participation of a highly trained staff, representing many disciplines and

nationalities, organized in a single resource pool, fostering integration in support of all three programs.

ISNAR has instituted a non-hierarchical structure, promoting collegial interaction, which is most appropriate for a professional organization with multidisciplinary staff working in multiple program and topic areas. There are no departmental or regional divisions to isolate staff by discipline or geographical background.

ISNAR's programs represent thrusts of activities, not organizational units. In an institution with varying activities, skill requirements, and diversity of clients, such a collegial approach facilitates the effective integration of staff knowledge and experience, the progressive build-up of its enhanced knowledge base, and staff participation in all three of the functional programs.

ISNAR's staff includes: 1) experienced research managers, with formal training in the agricultural sciences and broad-based experience in the management of NARS and 2) specialists, with knowledge in the areas of research policy, organization, and management. They fully complement each other. Jointly, they identify the needs of NARS and diagnose constraints to system productivity. Jointly, they work on generating, adapting, and testing, under real-life circumstances, the management tools they develop. Jointly, they assist NARS in applying these tools. Jointly, they ensure the quality and relevance of those tools.

ISNAR's experienced research manager group concentrates on developing and maintaining linkages with national systems; the organization and management specialists act as product managers.

In the division of labor, the experienced research manager group concentrates on developing and maintaining national systems' linkages with ISNAR; the organization and management specialists act as product managers, concentrating on tool development and maintaining ISNAR's upstream linkages with specialized institutions and universities in research policy, organization, and management.

In some cases, a NARS and ISNAR decide that the continuous presence of a senior ISNAR staff member is required — in an advisory position — within a NARS, providing continuous support in implementing specific system-building plans or programs. Such research management specialists assist in the build-up of policy, organization, and management capacities in the respective national systems. They do not take on line management responsibilities. Nor do they substitute for weak management in the NARS.

While their primary responsibility lies with the advisory service program, they also make important contributions to research and training. They contribute to the build-up of ISNAR's knowledge base on NARS, and coordinate or execute special studies in the research program. They help prepare and validate training materials, identify training opportunities, and organize training events.

ISNAR's project approach helps focus different people on different tasks in different time frames; and provides for individual staff responsibility for particular projects.

Supporting its decentralized organizational structure is a project approach. A matrix format helps focus different people on different tasks in different time frames, and provides for individual staff responsibility for particular projects. Each project is clearly described and evaluated in terms of its contribution to ISNAR's priorities and strategy.

### **ISNAR'S size and program balance**

The preceding pages outline ISNAR's strategy for working with national agricultural research systems. They define ISNAR's overall goal, the specific objectives of its advisory service, research, and training programs, and its program content. This section explains how ISNAR determines its size and staffing pattern within the context of its strategy. Three considerations influence them:

ISNAR's advisory service, research, and training programs must remain in balance. NARS' direct demand for advisory services creates an indirect demand for the products of the research and training programs.

1. **NARS needs and requests.** Since ISNAR is a service organization, NARS demand for its products and services affect its scale of operations. Demand has always outpaced ISNAR's capacity to respond. As a result, ISNAR emphasizes the maximum potential multiplier, which means increasing attention to the research and training programs. Both of them generate and extend improved management tools for NARS leaders' use.
2. **Impact on NARS.** ISNAR obviously wants to work with as many NARS as possible while, at the same time, ensuring that its work with any NARS is intensive enough to have an impact. In its optimum scenario, ISNAR plans to work with 28 NARS. That is a target figure, not a firm commitment. ISNAR will continuously evaluate this level.
3. **Minimum and optimum levels of personnel.** ISNAR's advisory service, research, and training programs must remain in balance. NARS' direct demand for advisory services creates an indirect demand for the specific products of the research and training programs. Whereas the advisory service program can be expanded and contracted in response to changing demand — both the research and training programs require investment of resources in developing management approaches and training materials. Without a minimum capacity to carry out these functions, sustainability of the advisory service is compromised.

ISNAR has determined that it requires 34 senior staff to sustain a minimum program of essential activities, and to function as a viable institution. This is the critical mass needed to:

- \* deliver a balanced program in pursuit of its goal;
- \* achieve a reasonable return on its investment;
- \* have an impact in collaborating with some 20 NARS through its advisory service program;
- \* maintain a knowledge base on NARS, adapt or develop tools for NARS managers in six of its priority factors, maintain its internal analytical capacity in the remaining six, and undertake in-depth studies of issues of urgent need or topical interest through its research program;
- \* prepare training materials with the help of ISNAR's advisory service program experts, researchers working on research policy and management questions, and disciplinary specialists in the fields of organization and management sciences — and conduct workshops and seminars at the global, regional, and national level.

With less than this critical mass, ISNAR suffers a loss in investment efficiency. Furthermore, this represents a nucleus around which ISNAR can build a larger program with expanded impact potential. It aims to attain an optimum size of about 50 senior staff. This would allow it to work with some 28 NARS in its advisory service program, and to accommodate the accompanying increased demand for research and training.

**Its strategy guides its staffing pattern.** The twelve critical factors for strengthening NARS fall into the three broad areas of research policy, organization, and management. Analysis of political, structural, and procedural issues calls for a broad range of disciplinary specialties in the management and social sciences, while the required knowledge of agricultural research in developing countries calls for other skills and experience. ISNAR seeks individuals with these diverse skills and experience, plus at least minimum capability in the essential languages of the developing world.

In its early years — when broad-based system reviews were ISNAR's central activity — priority was placed on building up a strong cadre of senior, experienced, research managers. Now, guided by its strategy, ISNAR is giving priority to building up a complementary cadre of specialists with specific

expertise in the organizational and management sciences. This mix is strengthened by in-house teamwork — bringing complementary staff skills to bear on issues and problems — supplemented by specialization that ISNAR needs from university staff on part-time appointments.

## Conclusion

ISNAR is fulfilling its role within the international community, and the broader global CGIAR efforts to stimulate agricultural development to improve the nutritional level and general economic well-being of low-income people in developing countries.

ISNAR is still a young institution, working in a complex field with tremendous potential for development. Moreover, as ISNAR's service has become better known and understood, the demand from NARS for assistance exceeds ISNAR's capacity to respond — not only in terms of the number of countries requesting assistance, but also in terms of the range of services and products needed. The level of institutional development and capabilities of NARS is highly variable, consequently, the needs and opportunities for assistance are also very diverse.

ISNAR's strategy guides program development in order to maximize the impact of its limited resources and ensure the relevance of its program to the priority needs of NARS.

In order to successfully meet these challenges, ISNAR must continue to systematically build on and synthesize its experience, and vigorously pursue its development as a recognized authority in the field of agricultural research policy, organization, and management in developing countries.

This requires forward-looking vision, a continuing appraisal of future demand for its services, and a clearly formulated strategy. The strategy guides program development and ISNAR's response to countries' requests for assistance in order to maximize the impact of its limited resources and ensure the relevance of its program to the priority needs of NARS.