Report of a Workshop



# ORGANIZATION AND STRUCTURE OF NATIONAL AGRICULTURAL RESEARCH SYSTEMS:

## Selected Papers from the 1989 International Agricultural Research Management Workshop

June 1990

isnar

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, 1980. 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 thirteen 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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## Selected Papers from the 1989 International Agricultural Research Management Workshop, The Hague, 5–10 November 1989

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**Citation:**

ISNAR. 1990. Organization and structure of national agricultural research systems: Selected papers from the 1989 international agricultural research management workshop. The Hague: International Service for National Agricultural Research.

**AGROVAC Descriptors:**

Research; Research Institutions; Management; Research Policies

**CAB Descriptors:**

Research Policy; Organization of Research; Research Institutes; Government Research; Research

# Contents

# Introduction

Annually, ISNAR holds an international workshop on management issues for leaders of national agricultural research systems (NARS). This workshop takes the form of a consultation with NARS leaders, providing feedback on the relevance and applicability of our approaches, allowing us to refine our continuing collaboration, and providing input for the incorporation of NARS needs and experiences into on-going research activities.

In 1988, for the first time, the entire conference was organized around a single theme, human resource management. In 1989, continuing our thematic approach, one of the themes selected was organization and structure. The selection of this theme was a recognition that organization and structure are critically important to the effectiveness and efficiency of a NARS. They shape the way the system operates as well as its capacity to perform its assigned functions and achieve its designated objectives.

The purpose of this thematic approach was multifold: First, it was an opportunity to present ISNAR's general experience with research on organization and structure to NARS leaders and practitioners. Second, it provided a forum for participants to compare their own experiences in organization and structure with those encountered by their colleagues in other regions of the developing world. And, third, it was an opportunity for participants to discuss the applicability of ISNAR's approaches.

The workshop itself was divided into critical areas of organization and structure that have emerged from ISNAR system reviews as well as from research and training activities. These critical areas include securing domain legitimacy, research policy issues, coordination, and program and administrative management, i.e., issues of autonomy.

The proceedings include the papers and presentations used, as well as the feedback and suggestions received from NARS managers. The workshop was a worthwhile endeavor, and it is hoped that the readers of these proceedings will be stimulated to thought and action on the issues raised.

*Paul Marcotte*
Training Coordinator

The ISNAR Working Group on Organization and Structure of National Agricultural Research Systems is an integrated group of members who are mainly oriented towards research or involved in advisory services, covering all regions of the developing world (Africa, Asia, West Asia and North Africa, and Latin America).

The main responsibilities of the working group are listed below:

- to enhance previous efforts in building up ISNAR's considerable, but still insufficiently exploited, knowledge base and expertise about the organization and structure of NARS;
- to ensure that each research project generates output that is both relevant and conceptually sound for advisory services and training, and that this output is in a form appropriate to NARS managers;
- to ensure that the methodology of each project provides opportunities for receiving substantial feedback from NARS leaders;
- to serve as a forum for the exchange of views and for peer review at different stages of the work.

One of the two main projects initiated by this working group in 1988 and 1989 is entitled "The Organization and Structure of NARS." This project benefits from special project funds from CIDA in Canada, and the final products of this project are expected to be the following:

- five regional overviews (anglophone and francophone Africa, Asia, West Asia and North Africa, and Latin America);
- papers on organizational choices at the level of national institutes and programs;
- a synthesis of lessons from experience as well as considerations and guidelines for organizing NARS.

The November 1989 International Workshop was an essential step in the implementation of the project, since it provided the opportunity for a critical review with NARS leaders of progress to date. It also helped us to identify specific issues to be examined in the next phase of the project.

*Guy Rocheteau*
Working Group Chairperson

# PROSPECTUS

## International Agricultural Research Management Workshop

International Service for National Agricultural Research
(ISNAR)

5 to 10 November 1989

## 1. Introduction

ISNAR's annual International Agricultural Research Management workshops provide an opportunity to discuss our on-going research, advisory service, and training activities with our partners in national agricultural research systems (NARS). We consider direct feedback from senior NARS leaders on the relevance and applicability of our work to be of crucial importance to us. It enables us to incorporate the NARS's needs and experience into our on-going research and other activities.

## 2. Purpose

The purpose of this year's workshop is to provide NARS managers the opportunity to participate in the development of management tools, become familiar with our state-of-the-art approaches, and exchange experiences and views on three priority management themes. For ISNAR, the purpose is to receive constructive feedback on our analytical approach, intermediate research products, and training materials. The three themes are priority setting and planning, organization and structure, and program budgeting and management information systems.

Participants will be asked to contribute actively to the workshop by reviewing and intensively critiquing the work presented in plenary discussions and small groups. The critique should focus on the relevance and applicability of the concepts and tools to individual country situations.

## 3. The Three Themes

### a. Planning and Priority Setting

Research managers in developing countries work under severe funding constraints. There is an increasing need to set priorities among competing programs and to establish an effective planning mechanism for resource allocation. Through planning, research priorities are identified, objectives are defined, strategies are developed within specified time horizons, and resources are committed.

At the workshop, the content and processes of priority setting and planning will be discussed. Methodologies, guidelines, and exercises being developed will be submitted to participants for review and suggestions.

### b. Organization and Structure

The structure and organization of a NARS critically influence effectiveness and efficiency. They shape the way the system operates as well as its capacity to perform its assigned functions and to achieve its designated objectives.

Two research projects are being conducted under the guidance of ISNAR's working group on organization and structure: a study of organization and management in small-country NARS and a global, comparative study of the organization and structure of NARS. The research projects analyze the effectiveness of different organizational options in performing various research and governance functions. The two projects' analytical frameworks and five regional overview papers will be submitted to participants for review and discussion.

c. **Program Budgeting Systems and Management Information Systems**

Adequate and timely information is essential for good program budgeting and management. Research managers must match available personnel, funds, and materials to the resource requirements of a research program. In many NARS, the system for collecting and analyzing information in support of the planning and priority-setting process needs assistance.

ISNAR's working group on program budgeting and management information systems will seek feedback from workshop participants on the approach, tools, and information system suggested by ISNAR for use at the national and station levels of NARS at different stages of development.

## 4. Participants

The workshop is designed for senior agricultural research managers with particular interest and expertise in one or more of the three management themes. Thirty participants have been invited from Africa, Asia, West Asia and North Africa, and Latin America. (Two-way translation [English-French] will be provided for the plenary presentations.)

## 5. Program

General issues and analytical frameworks for the three management themes will be discussed in plenary with all 30 NARS participants. In the introductory session, the participants will be introduced to critical factors of management which fall within broad areas of research policy, organization, and management. The three themes selected for the workshop represent each of these broad areas, respectively, and as essential components of a research system, they are interrelated and mutually reinforcing.

It is ISNAR's contention that deficiencies in any of these areas inhibit the development of a system as well as its efficiency and effectiveness. Subsequent to the introduction and thematic presentations in plenary, thematic consultation will take place in small groups of about 10 participants each. In outline, the workshop program is as follows:

| November 5 Sunday | November 6 Monday | November 7 Tuesday | November 8 Wednesday | November 9 Thursday | November 10 Friday |
|---|---|---|---|---|---|
| Arrival/Check-In at Pullman Hotel | -PPS | -PBS + MIS<br>-Discussion | Thematic* | Thematic* | Preparation and presentation of group reports |
| *LUNCH* | *12.00-13.30* | *12.00-13.30* | *12.00-13.30* | *12.00-13.30* | *12.00-13.30* |
| | -PPS cont.<br>-O&S | Thematic* | EXCURSION | Thematic* | -Discussion<br>-Closing<br>-Reception |
| Welcoming & introduction Reception at Pullman Hotel, 19.30 hrs | | DINNER: Boterwaag Restaurant, 19.00 hrs | | | |

Note:PPS=Planning & Priority SettingO&S=Organization & StructurePBS + MIS=Program Budgeting Systems & Management Information Systems
*Thematic, small-group discussions. All other sessions are in full-group plenary.

This workshop schedule provides two days for plenary discussion of broad issues and analytical frameworks covering the three themes and their interactions. There are also two days for detailed thematic discussions.

Since most senior NARS managers are "generalists" in agricultural research management, the plenary presentations will emphasize issues at the national and institutional levels. Details of methodologies, tools, exercises, illustrative case studies, etc., will be discussed in small groups.

On the final day, the conclusions and recommendations of the thematic discussions will be presented in plenary. Responsibility for this will be shared between the NARS participants and ISNAR staff members (as small-group rapporteurs).

The concluding plenary discussion will focus on the recommendations from the workshop as instructive for future planning for the three thematic working groups.

In addition to the thematic activities, other events have been scheduled, such as a welcoming reception, an excursion to Holland's famous greenhouse area to visit companies/cooperatives specializing in vegetable production, a workshop dinner, and a closing reception. These will provide opportunities for participants to interact and exchange information in a less formal setting.

## 6. Process

Plenary discussions will be structured around presentations on specific management themes by ISNAR staff. Concepts, issues, and analytical frameworks as well as the interrelationships across themes will be emphasized.

Active participation of NARS participants will be sought — they will act as chairpersons of plenary sessions and as discussants of papers sent to them in advance. To make the presentations analytical, focused, and productive, a two- to three-page issues paper/executive summary will be prepared and circulated in advance for each of the papers presented.

Discussion sessions will vary in format. The specific objectives of each working group will dictate the process used for obtaining feedback on ISNAR's activities.

## 7. Products

In all three management themes, ISNAR's staff has attempted to synthesize our experience and develop concepts and tools for improving our diagnostic and analytic capacity for assisting NARS. The feedback from senior NARS managers will help improve the research and training products we develop.

NARS managers will have the opportunity to exchange ideas and experiences with their counterparts in other national systems and will have the opportunity to critically evaluate the applicability of ISNAR's work to their own country and region.

A workshop report will be published. This report will synthesize the experiences and conclusions of ISNAR staff and NARS participants and consolidate the lessons learned.

## 8. Logistics

- **Dates:** The workshop is scheduled to begin on 6 November at 9:00 AM and to end 10 November at 16:30. A half-day excursion is planned for the afternoon of Wednesday, 8 November. Participants should arrive in The Hague 5 November and are expected to depart 11 November 1989.

- **Venue:** ISNAR, Laan van Nieuw Oost Indië 133, The Hague, The Netherlands
  Telephone: 070-496100, Telex: 33746 isnar nl

- **Lodging:** Pullman Hotel, Spui 180, 2511 BW The Hague
  Telephone: 070-614921, Telex: 32000 cenho nl

- **Transportation:** International and local transportation arranged by ISNAR.

- **Subsistence Allowance:** Hotel charges, including breakfast, paid by ISNAR.
  In addition, each participant will be provided a standard subsistence allowance to offset the cost of meals and incidental expenses.

- **Contact:** Dr. Paul Marcotte
  Coordinator
  International Workshop on Agricultural Research Management
  ISNAR
  P.O. Box 93375
  2509 AJ The Hague, The Netherlands

# Participants

**Dr. Celestin Belem**
Directeur
Institut National d'Etude et de Recherches Agricoles (INERA)
B. P. 7192
Ouagadougou, BURKINA FASO

**Dr. Li Dehua**
Hebei Science and Technology Commission
Fuoiang Street
Shijiazhuang, Hebei, CHINA

**Dr. Emilio Madrid**
Executive President
Instituto de Investigaciones Agropecuarias (INIA)
P. O. Box 439/3
Santiago, CHILE

**Dr. J. K. Mukiibi**
Secretary for Agricultural Research
Ministry of Agriculture
Entebbe, UGANDA

**Dr. Charles Razafindrakoto**
Directeur Général
FOFIFA
B. P. 1690
Antananarivo, MADAGASCAR

**Dr. F. M. Shao**
Directorate of Research and Training
Ministry of Agriculture & Livestock Development
P. O. Box 9071
Dar es Salaam, TANZANIA

**Dr. C. H. Zafar Uddin**
Director of Planning
Pakistan Agricultural Research Council (PARC)
Plot No. 20, G-5/1
Post Box 1031
Islamabad, PAKISTAN

## ISNAR Participants

**Matt Dagg**
Principal Staff

**Anne Duhr**
Support

**Pablo Eyzaguirre**
Principal Staff

**Dely Gapasin**
Principal Staff

**Ghazi Hariri**
Principal Staff

**Paul Marcotte**
Principal Staff

**Guy Rocheteau**
Principal Staff

**Paramjit S. Sachdeva**
Now located at the following location:
PHRHN, Room S-6127
The World Bank
1818 H Street, NW
Washington, DC 20433, USA

**Y. D. A. Senanayake**
Consultant
Director
Post-Graduate Institute of Agriculture
University of Peradeniya
P. O. Box 55
Peradeniya, SRI LANKA

**T. Ajibola Taylor**
Principal Staff

**Carlos Valverde**
Principal Staff

# Analytical Framework for the Organization and Structure of NARS

**Paramjit S. Sachdeva**
*Formerly, ISNAR Training Officer and Project Manager*
*of the CIDA-funded Study on the*
*Organization and Structure of NARS*

## Introduction

The organization and structure of a national agricultural research system (NARS) are critical factors determining its effectiveness and efficiency. They shape the way the system operates and its capacity to perform functions for achieving designated objectives.

Over the years, developing countries have sometimes instituted major structural changes in response to changing research strategies and priorities. Semiautonomous research institutes and private foundations in Latin America and agricultural research councils in Asia are examples of organizational models currently in use. A number of countries have also made structural changes in response to external pressures, aid inducements, or shifting political winds.

The organization and structure of many NARS are incompatible with national development objectives and available resources. Resource allocation has become seriously imbalanced as countries struggle to maintain large fragmented infrastructures of research stations and laboratories, while running short of funds to pay scientists adequately or to allow them to carry out their research.

The experience of various NARS leaders in planning for and carrying out organizational restructuring could be useful to their counterparts in other countries in future decision making — so could an assessment of the strengths and weaknesses of the various organizational options. There is also a need to devise an analytical framework for NARS leaders to compare available options with their current situation so as to make more informed decisions regarding future changes. Such a framework is presented below.

## Definition of Terms

A *NARS* comprises various bodies dealing with agricultural research: government institutions, universities, private-sector research institutions, and parastatals. The relative importance of public- versus private-sector components varies from country to country. In most developing-country NARS, the public-sector component is dominant.

*Organization and structure* refer to the institutional arrangements and mechanisms for mobilizing human, physical, financial, and information resources at all levels of the research system. More generally, an *organization* is a coalition of interest groups, sharing a common resource base and depending on a larger environment for its legitimacy and development. It is characterized by decision making (such as in the area of resource allocation, monitoring, and control) and formal and informal communication.

*Structure* is determined by the way work is divided into distinct tasks and coordinated to achieve stable patterns of behavior and output. It regulates the flow and exchange of various resources — products, services, information, power, etc. — within the research system as well as with its environment.

Key aspects of structure include the size of the research system, the number and types of research institutes, the institutes' responsibilities and mandates, the system's communication and collaboration patterns, and the internal organization of research within individual institutes and experiment stations.

## Analytical Approach

Simply put, organizations provide a context for the performance of management functions required to transform resources into desired research products. A variety of organizational mechanisms can be used at different hierarchical levels.

Major managerial and linkage functions include system governance, strategic planning, program planning, programming, implementation, monitoring, and review. The analytical

framework presented here is intended to help examine *how* and *why* certain structures facilitate or hinder the performance of such functions.

In organizing and managing a NARS, research leaders have a wide range of goals. They expect a NARS to be organized so as to

- integrate research and development activities;
- promote and coordinate research;
- integrate research planning and implementation;
- facilitate the use of resources;
- coordinate the monitoring of research;
- expedite the utilization of results.

A positive work environment, competent people, good information, and sound policies, strategies, and management — all these make for effective research programs when combined in an appropriate organizational structure. The choice of a suitable structure should be made in light of existing and planned program requirements, managerial systems, and available resources.

The choice should also be based on **functional** criteria such as

- responsiveness to stakeholders;
- adaptability to environmental change;
- potential for enhancing creativity and productivity;
- appropriateness for generating relevant, high-quality research;
- suitability for country circumstances.

Different organizational options facilitate or inhibit the performance of management functions to varying degrees. The main task of organizational design or redesign is to adjust the major features of a NARS or research institution to increase the *potential* for program effectiveness.

The major *design variables* in organization and structure are

- **division** of work — the number of research units, the basis for dividing work, and the types of vertical and horizontal linkages needed;
- **coordination** mechanisms — committees, task forces, teams, liaison roles, rules, and procedures;
- extent and nature of **authority** and **influence** over funds, resource allocation, priorities, administrative rules and procedures, and external relationships;
- decision-making processes for planning, programming, implementing, monitoring, and control.

## Analytical Framework

A *functional* analysis of organization and structure is outlined below. It lists the key research management functions to be performed at three levels — national, institutional, and research station. Their major component activities are also noted.

### National Level: System Governance

*Securing domain legitimacy, consensus, and resources (political, financial, and human)*

- Establishing the network of linkages (with other ministries, agencies, donors, clients, and users) for exchanging information, building coalitions, securing resources, and ensuring accountability for use of public funds.

*Determining research policy, objectives, and strategy*

- Determining the planning and coordination mechanisms at the national level.
- Organizing the apex body itself: its legal status, mandate, functions, authority, responsibility, composition, subcommittee structure, operational procedures, etc.
- Providing technical support for the apex body.

*Organizing the NARS for implementing strategy*

- Determining the system's structure by dividing the work among research institutions. Options include institutions
  - under central or provincial auspices with national or regional coverage;
  - that are semiautonomous or directly controlled entities;
  - for commodity-, discipline-, area-, or factor-based research;
  - for applied or adaptive research.
- Determining mechanisms for interinstitutional collaboration. Options include
  - establishing subdirectorates within the supervising ministry or department (for crops, livestock, technical services, etc.);

- funding of interinstitutional or multidisciplinary research;
- sharing of infrastructural facilities and stations;
- establishing program committees by agroecological or administrative region;
- estabishing ad hoc task forces and review teams;
- establishing a project coordination unit or a committee for donor-funded projects.

- Determining the authority and responsibility at various decision-making levels. This includes
  - determining the nature and amount of program and administrative authority at national and institutional levels. (This determines the degree of centralization/decentralization.)
  - determining the nature and extent of formal regulations, rules, and procedures governing subordinates' behavior. (This determines the degree of formalization or bureaucratization. A decentralized system can still be highly bureaucratic.)

*Implementing, monitoring, and evaluating strategy*

- Establishing mechanisms for priority setting and resource allocation, and for planning, implementing, monitoring, and reviewing research strategy and programs.

**Institution Level:**
**Program and Administrative Management**

*Research programming, implementing, monitoring, and review*

- Establishing mechanisms and processes for making program decisions.

*Organizing research and supervising implementation*

- Determining the internal structure of each research institution. This involves
  - deciding the basis for dividing the work, whether by commodity, discipline, area, factor, or a combination of these — such as a mixed or matrix structure;
  - selecting mechanisms for coordinating research within and between institutions or programs (options: research program committee, integrative manager or organizational unit, national coordinated research program).
- Delegating authority and responsibility for research and administration to department heads and program leaders.
- Determining mechanisms for ensuring accountability for resource utilization and for generation of results.

**Implementation Level:**
**Research and Station Management**

*Formulating and implementating annual programs*

- Establishing researchers' and station managers' responsibility for
  - determining research priorities within the strategic and program guidelines provided by national- and institution-level plans;
  - undertaking detailed programming; implementing and monitoring research.

*Organizing research implementation*

- Organizing the implementation-level research station network. Considerations include size, diversity, research emphasis, research-extension linkages, location, and availability of a critical mass of scientists. Of special interest is the organization of multi-institution, multiprogram or multidisciplinary teams.
- Organizing research stations, centers, or teams and establishing mechanisms for research programming, resource acquisition, program implementation, and generation and review of research conclusions.
- Organizing the manager's office, technical departments, and support services.
- Organizing the dissemination of research results. This involves
  - establishing mechanisms for providing feedback to higher management for program planning, programming, implementation, monitoring, and review;
  - establishing mechanisms for disseminating research conclusions to extension agents and farmers.

To summarize, effective research management requires attention in three areas: policy formulation and implementation, organization and structure, and managerial processes and functions. These operate at three levels: the nation, the institution, and the station.

The NARS policy and strategy help set future goals, give direction, and specify how the goals will be achieved. Organization and structure emphasize the design of work units,

their interrelationships, and the mechanisms for coordinating various tasks. Managerial processes and functions enable the effective and efficient production of desired outputs and services, using the available resources of people, money, and facilities. Achieving continuing coherence or fit between policies, strategy, organization, and management is the key task of top management.

At each level of the NARS — national, institutional, and research station — attention has to be given both to program content (the *why*, *what*, and *how* of research) and to program implementation (the *by whom*, *with what*, and *when* of action). To translate research plans, projects, and experiments into useful research results, the external environment has to be conducive to research productivity. In addition, to ensure efficient use of available resources, the internal organization and structure, management systems, and decision-making mechanisms and processes have to be suitable.

The analytical framework identifies a number of research and management functions and activities. These are carried out by means of various organizational mechanisms and processes at the national, institutional, and research station levels. The framework thus addresses such questions as

- *What* are the management functions?
- *Where* are they carried out?
- *How* are they implemented?
- *Who* implements them?

A number of *organizational options* are identified at each level. The framework is summarized in Table 1.

## Assessment of Organizational Options

The analytical framework identifies the functional criteria against which organizational options at various levels can be assessed. To facilitate this assessment, some factors and considerations determining the effectiveness of various organizational options are outlined below.

### National Level

At the national level, system governance requires the integration of a number of policy, organization, and management factors (ISNAR's strategy document identifies 12 critical factors for NARS). To ensure that these critical factors are given adequate consideration, many NARS have found it useful to establish a *central coordinating body* at the national level. The main *functions* of such a body (whatever its formal title — council, committee, board, etc.) are the following:

**Table 1. Organizing for Key Management Functions**

| Where? Level | What? Management Functions | How? Methodological Means | By Whom? Organizational Options |
|---|---|---|---|
| National | 1. Securing political, financial, and human resources | • information exchange<br>• coalition building<br>• ensuring external accountability for use of funds | • apex body: Board/Council, National Committee<br>• ministry<br>• semiautonomous institution<br>• some combination of above<br>• each institution independently |
| | 2. Determining policy and strategy and approving long-term research plan | • political processes<br>• socioeconomic studies<br>• analysis of technical potential<br>• assessment of availability of research resources | • apex body<br>• technical committee(s)<br>• ad hoc task forces |
| | 3. Organizing for implementing policy, strategy, and long-term research plan | • assigning responsibility<br>• interinstitutional coordination<br>• ensuring accountability of research institutions | • apex body<br>• committee<br>• task force |
| | 4. Supervising implementation | • reporting mechanisms for monitoring & evaluation and annual programming<br>• periodic review of organizational performance | • ministry dept.<br>• secretariat to apex body<br>• standing committees<br>• planning unit |

Table 1. (continued)

| Where? Level | What? Management Functions | How? Methodological Means | By Whom? Organizational Options |
|---|---|---|---|
| Institutional | 1. Research programming | • identification of production problems<br>• setting objectives<br>• assessing scientific potential, resource availability, and researchability<br>• setting priorities<br>• approving annual programs | • institution management<br>• research managers<br>• research committee |
| | 2. Organizing research and supervising implementation | • assigning responsibilities to implementation-level units<br>• coordinating between implementing units<br>• reporting mechanisms for monitoring & evaluation and annual programming | • institution management<br>• research managers<br>• program leaders<br>• multidisciplinary teams |
| Implementation Units | 1. Formulation of annual programs | • assessment of scientific potential, resource availability, and researchability<br>• setting priorities<br>• preparing study proposals and experiments | • unit management<br>• researchers<br>• multidisciplinary teams |
| | 2. Implementation of studies and proposed experiments | • experimental design<br>• conducting research<br>• data collection<br>• analysis<br>• interpretation of results<br>• dissemination of results | • reporting to higher management<br>• researchers<br>• technical and support staff<br>• extension staff |

- to advise on national agricultural research policy,
- to speak on behalf of agricultural research in discussions with policymakers and planners and to present research results in a usable form;
- to coordinate national agricultural research by undertaking strategic, structural, and program planning, as well as by helping set national priorities;
- to promote linkages between research, extension, and producers, as well as with international organizations and donors;
- to facilitate interinstitutional research and to promote collaboration among implementing agencies;
- to oversee the technical review of program plans and project proposals and to oversee the monitoring of program implementation;
- to help improve the component institutions' mechnisms for research planning, programming, implementation, and review.

This central body, along with its advisory subcommittees and technical secretariat, constitute the *strategic apex* of the system. For organizing the apex, five options are available (Trigo 1986). These organizational models are based on the structural and functional characteristics of the apex body and on the nature and extent of control it exercises over subordinate organizational units. The major organizational *options* are

- the *council* model, with variations: administering, coordinating, and funding councils;

the *institute* model, with variations: semi- and fully autonomous institutes;

- the *ministry* model, with variations: single ministry (usually agriculture and/or livestock) and multiple ministries;

- the *university* model;
- the *mixed* model, i.e., research by several different entities: ministries, institutes, universities, etc., without a central coordinating authority.

Some of the factors determining the effectiveness of the strategic apex are listed below:

*Council model*

- **comprehensive** mandate: a clear focus on national development goals and priorities;
- **direct** reporting to responsible minister: a powerful voice for agricultural research;
- strong **links** with ministries of planning and finance;
- key interest groups **represented** on the apex body;
- **sufficient** government and donor funds for developmental and recurrent expenditures on research;
- well-defined **strategy and guidelines** for long-term research programs;
- strong technical **secretariat** and central services.

*Institute model*

- **semiautonomous** status: direct control over organization and funding of research;
- strong **influence** over national research policy and priorities;
- effective **formulation** and implementation of a comprehensive research program;
- **flexibility** in financial management and procurement procedures;
- relative **autonomy** from civil service regulations and terms and conditions of service
- effective **implementation** of organizational and administrative policies.

These factors apply in general terms to all NARS and have to be suitably interpreted and adapted to the specific circumstances of each country.

### Institution Level

As at the national level, a number of organizational *options* are available at the institutional level. The national research task can be subdivided into institutions focused on the following types of research:

- **commodity or commodity groups**: crops, livestock, forest products;
- **discipline or groups of disciplines**: agronomy, pathology, crop sciences, veterinary sciences, etc.;
- **factors of production**: water, soil, genetic materials, etc.;
- **program or project**: national, subnational, multinational programs for rice, maize, etc.;
- **geographical area**: agroecological zones, administrative regions or subdivisions;
- some **combination** of the above, resulting in a mixed system and a more complex organization.

Each of these organizational options has strengths and limitations in terms of enhancing or hindering program performance. The pros and cons of some of the major institutional options are given in Table 2.

### Research-Station Level

A number of *options* are available for creating the research-station network. These include disciplinary subspecialization; commodity; geographical area; or a combination of these, forming a mixed or matrix arrangement. In the latter, two organizational bases simultaneously compete for administrative attention and program resources, and research is conducted through interdisciplinary teams.

Most NARS have research stations of various types at the national and subnational levels. They may have a single focus (commodity, discipline, or factor of production), a multiple focus, or a combination of these. In addition, some countries also have national coordinated research programs (NCRPs). These usually focus on a high-priority commodity covering a large geographical area.

These multistation national programs are difficult to organize and manage. They require a great deal of collaboration between scientists; a free exchange of ideas, materials, and information; and effective planning, implementation, and monitoring of research conducted at different stations.

NCRPs, however, because of their sharper focus and orientation toward results, have great potential to produce useful research. Other benefits of a properly organized NCRP are reduction of duplication or gaps in research conducted at different stations, easier adaptation of research recommendations to various agroecological regions, and increased confidence in technical recommendations to farmers.

**Table 2. Institutional Options: Pros and Cons**

| Structure Based On | Pros | Cons |
|---|---|---|
| Disciplinary research | • helps focus on scientific knowledge essential for basic research with long-term payoffs<br>• stability of departmental structure, despite formation of interdisciplinary project teams<br>• easier to hire scientists with suitable academic qualifications and to motivate experienced researchers | • research results not perceived by policymakers as directly relevant for solving practical problems<br>• departmental boundaries and allegiances become bottlenecks for interdisciplinary research |
| Commodities, commodity groups, or agroecological zones | • programs are closely linked to development goals and are directly relevant to solving producers' problems<br>• facilitates responsiveness to high-priority needs and well-defined goals | • dispersion of disciplinary specialists among various programs adversely affects technical quality of work<br>• multiplicity of stations exacerbates constraints related to manpower, operational funds, and facilities |
| Mixed or matrix arrangements | • gives institutional flexibility in forming project-based multidisciplinary research teams, this facilitating rational use of scientific, technical, and other resources<br>• can focus on agroecological (area-based) and production systems research without weakening emphasis on disciplinary or commodity research | • multiple and overlapping lines of authority and responsibility make the structure complicated and cumbersome to manage<br>• difficult to strike a balance between hierarchical control and decentralized program planning and monitoring; this can lead to reduction (not increase) in accountability for program performance |

These benefits do not come easily. *The major factors affecting the success of NCRPs are*

- **Focus**: national focus on a high-priority problem, resource, or commodity; program emphasis on a few, well-defined, achievable objectives;
- **Funding**: a time-bound program, adequately funded, staffed, and supported; sufficient operational budget for travel, maintenance, etc.; stability and timeliness of funding; and sufficient flexibility in using funds to respond to changing program needs;
- **Planning**: effective central planning and coordination, adequate field testing in representative stations, and feedback and use of test results for continuous adaptation of the ongoing research program;
- **Control**: annual review of objectives, methodologies, resource requirements, work plans, and priorities; as well as their suitable modification as circumstances change;
- **Accountability**: high degree of accountability for resource utilization and results, based on effective monitoring at the research stations and regular feedback by the national program coordinator;
- **Feedback**: thorough on-farm testing and evaluation of technologies under farmers' conditions, to assess their transferability, potential, and limitations; and, toward this end, close collaboration between researchers, extension workers, and producers at all levels of the NARS;
- **Leadership**: the coordinator's qualities of leadership, service, and cooperation; careful selection of a competent team with an appropriate mix of disciplinary skills.

## Concluding Remarks

An analytical framework for organizing and structuring a NARS, together with the key considerations in assessing various organizational options, has been presented above.

This framework underpins a research project currently under way at ISNAR. The objectives of this project are

- To develop an analytical framework and typology for diagnosing organizational and structural problems in NARS and for developing solutions to these problems;
- To draw lessons from ISNAR and NARS experience in dealing with organizational and structural issues and to make this experience accessible to research leaders;

- To identify methodological approaches and guidelines for use by NARS managers and ISNAR staff 'o assess and improve the effectiveness of organizations and structures.

In the first phase of this project, five issue-oriented regional overview papers are being written by ISNAR staff and consultants. These papers cover anglophone Africa, francophone Africa, Asia, Latin America, and West Asia and North Africa (WANA).

Based on a synthesis of ISNAR's experience in collaborating with NARS in system reviews and planning, and on selected secondary data, these papers adopt a contingency approach to organizational analysis. In assessing organizational effectiveness, and in undertaking intercountry comparisons, the papers seek to identify underlying trends and tendencies that could be of interest to a general audience of NARS leaders.

The expectation is that regional assessments based on a thc common analytical framework discussed above will improve our understanding of which organizational options work well, which do not, under what conditions, and why.

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# Securing Domain Legitimacy and Ensuring Resource Mobilization

**Guy Rocheteau**
*ISNAR Senior Research Officer and Convenor,*
*ISNAR Working Group on Organization and Structure*

The management function we are going to examine has been put under the heading "Securing domain legitimacy and ensuring resource mobilization." Performance of this function is essential to the productivity of the agricultural research sector. No results can be expected if resources are not provided at a sufficient level, in a timely fashion, and on a continuing basis. In many countries, these conditions are barely met because national budgets are small and overall donor funding is unstable.

The purpose of our discussion is to identify and assess the advantages and disadvantages of the various methodological means and organizational devices that have been used to perform this management function.

## The National Agricultural Research Systems Are Not Credible and Influential Enough

External agencies, which in many cases provide an important part of the investment and working budgets of agricultural research, often finance fixed-term projects piecemeal. This situation is not conducive to research continuity. The interruption of ongoing programs due to a lack of stable financing results in researchers being demoralized and acquired knowledge wasted.

National institutions are confronted with a double challenge:

- On the domestic front, national institutions have to convince national governments that, as far as financing is concerned, research should be given priority over other sectors (such as national education or health) where needs are equally urgent and where the benefits from investment are less uncertain. How can national agricultural research systems (NARS), in the absence of any immediate visible impact of their research results on development, convince their governments to mobilize funds to implement necessary reforms and to carry out the programs entrusted to them?
- On the international front, they must try to obtain the agreement of their financial backers to implement mechanisms guaranteeing a certain continuity in external financing.

## Relationships between Research and Its Political Environment Must Be Institutionalized

The main problem is insufficient credibility of national research institutes in the eyes of their partners. The solution is to modify the actual relationships between research and the political environment, both national and international. The national scientific communities must learn to organize themselves to improve their image and to strengthen their ability to negotiate their relationships with external partners.

The personal influence of research managers, good public relations, and a demonstrated company spirit are essential to a successful relationship with the political environment. But these are not enough. The process must also be institutionalized.

## Three Main Mechanisms Can Be Used

Information exchange, coalition building, and ensuring accountability for the use of funds are three means of institutionalizing the relationship between the research system and the political environment.

### 1. Information Exchange

The main concern should be to develop public relations and communication services within research institutes and/or ministries responsible for agricultural research.

In most cases, almost all these functions are carried out by the managers of the institutes themselves. But with increases in responsibilities and the number of personnel to manage, it is difficult for them to handle the situation effectively.

Research organizations today should know that public relations and communications are time-consuming and require professionalism. These functions include activities such as writing annual reports, conference reports, and internal bulletins; preparing information for radio or television broadcasts; organizing agricultural fairs and station or laboratory visits; even welcoming visitors and drafting official correspondence. Most research managers are aware of the problem, but too many of them are still reluctant to list such functions in the organizational chart and in the actual budget of the institute.

**2. Coalition Building: Creating an Influential Network in Favor of Research**

The purpose of coalition building is to mobilize groups or individuals who are likely to intervene on behalf of research at different levels of government. In this respect, the approach used by the Institut National pour l'Etude et la Recherche Agronomiques (INERA) in Zaire is particularly interesting. The responsible ministries decided in 1984 to adopt a new agricultural research development policy. The representatives of the research institutes negotiated and were authorized to create an ad hoc study group and, later on, an ad hoc follow-up commission on the reorganization of agricultural research based on the following:

- The ad hoc commissions are entitled to define their working methods and procedures and to operate free of bureaucratic constraints.
- Each commission has its own permanent secretariat and is entitled to form working groups charged with gathering the necessary information.
- Their members, nominated in their personal capacity, are chosen from among senior government officials. They are chaired by people who have no executive authority but who have an advisory function at the highest level of government. As such, they are able to take initiatives, defend positions without involving the authorities on whom they depend, and negotiate with them in an informal way.
- The commissions have an interministerial character. Their members are senior advisors to the president of the country, the prime minister, and the ministers of scientific research, higher education, agriculture, planning, finance, and budget. This guarantees that the state commissioners sitting on the executive council of Zaire, where all final decisions are made, feel fully involved as NARS backers.

Experience has shown the efficiency of such a mechanism. First, the recommendations of the commissions, formulated by political managers, have a greater credibility with the policymakers than those coming from representatives of the research institutions. Second, commission members, who participate on the basis of a voluntary and personal commitment, are at the base of an influential network lobbying for agricultural research. The effects can be felt well beyond the commissions' period of activity.

**3. Ensuring External Accountability for the Use of Funds**

*Effectively Planning and Managing the Services of Research for the Development Sector*

The research institute's main mandate is to execute research programs. However, other types of institutional activities, not specified in the mandate, must also be taken into consideration. These include "circumstantial activities" — research institutes must continually prove their utility and impact, i.e., that their services and short-term interventions meet the urgent needs of public and private development agencies.

Research managers should include these interventions in their budget and annual activity plan. They should be aware of the fact that the efficiency of an institute will be evaluated on the quality of the services rendered.

*Institutionalizing the Relations between the Research Sector and Other Sectors of Government Administration*

It is fundamental that the agricultural research sector maintains continual contact with the various ministries that use its results (planning, economy, agriculture and rural development, industry, and education), as well as with the ministries that determine future support (finance, public service, planning). This contact guarantees information sharing and the establishment of trust. It is particularly important in countries where the executive power is strongly centralized and where all the government's administrative problems are normally handled in detail by councils of ministers.

The most important institutional relationships include the following:

- Constant and productive participation of agricultural researchers in the commission sessions held by the ministry of planning during the preparation of the national development plan.
- Participation of representatives of other ministries in the management or administration councils of research institutes, especially participation of authorities assigned to formulate scientific policy in agriculture. Experience has shown that a ministry's participation in an institute's council is better when it does not limit itself to mere formal representation but includes a technical contribution.

- Participation of the users of research results in setting up and following up on program implementation. What is important here is the level of satisfaction among those who, at different levels of the social hierarchy, represent the interests of users and contribute more than anyone else to forming the image that the political world has of research. These people include technicians that have a national audience, persons in charge of project or planning companies, manufacturing trade unions, etc.

### Involving International Partners in NARS Development Planning

In general, the groups of donors that contribute to agricultural research are external to the research system. In meetings between representatives of the agricultural research system and donors, the agricultural research sector expresses its funding needs and donors specify their conditions. Conflicting viewpoints are expressed at such meetings, and this often results in reluctant compromises or misunderstandings.

The preferred situation is to form a real partnership in which decisions are made jointly.

An example of such an approach is the seminar on agricultural research organized by the government of Rwanda in 1983. The 108 participants included national policymakers, national agricultural research managers, and representatives of different international donors such as cooperation agencies, development banks, and international agricultural research centers. Together they studied the possible contributions of research to national agricultural development. The Government of Rwanda also took advantage of this opportunity to explain to the international community, and to discuss freely, the main points of its new scientific policy in agriculture.

In a different context — the preparation of an agricultural research development project — INERA in Zaire made a similar decision but on a smaller scale. The traditional donor group, functioning as an autonomous entity, promoted a dialogue between the donors and INERA, which was represented by its main managers. The meetings are still chaired by a representative of the donors but they are held at the headquarters of the institute, which in itself has symbolic value. The discussions are informal and the participants strive to reach unanimous decisions.

## Discussion by Participants

**Ghazi Hariri** (ISNAR) — Concerning the securing of domain legitimacy, several practical points need to be raised. First, securing domain legitimacy is an ongoing process involving communication and exchange of information. Second, the exchange of information is both formal and informal and requires personal participation. Third, this exchange works best when there is an established forum — such as a council — or regular meetings and when people are designated to participate. For example, Iraq has a complex system of national agricultural research organized under three umbrellas:

- a semiautonomous body (right arm of the ministry of agriculture);
- a scientific research council (water and biology research centers, the biotechnology center being semiautonomous);
- a ministry of higher education, comprising five faculties in which the professors dedicate 50 percent of their time to research.

The government supports the entire ministry of agriculture as far as transfer and adaptation of technology are concerned. Hence the nomination of a strong director general who is supported by the chairman. However, there is a lot of competition. Agricultural growth is close to zero, and the agricultural research network explains this failure by blaming the organization, forgetting to place the blame as well on the two other bodies, and consequently they fired the chairman. Hence, the dilemma of legitimizing agricultural research. This is an example of a difficult situation.

**Ajibola Taylor** (ISNAR) — I would like to reinforce what Ghazi Hariri said by emphasizing that the securing of domain legitimacy is a continuous function that is not guaranteed merely by the existence of legal statutes or committees. Research is a long-term activity, but its results and credibility depend upon short-term results. This a difficult problem research must address to secure domain legitimacy.

**Carlos Valverde** (ISNAR) — Securing domain legitimacy depends to a great extent upon the institutions' structural characteristics. We can see this quite well in the case of Latin America. Principal among these characteristics is whether the institutes are decentralized and their level of autonomy. In the Caribbean, by contrast, research is concentrated in ministries, where there are autonomous institutes. The important thing is to introduce the concept of participation. For example, INTA (Argentina) was a decentralized institution, very autonomous, and with centralized planning. There was not enough participation by the government and the producers. They have had to decentralize to ensure the participation of producers and establish a clear mechanism for the government to have a voice.

Another example is INIA (Chile). Here what was needed was to increase the representation of the board by creating a council with representatives of the ministry and the producers.

ISNAR is working in Uruguay to set up another decentralized institute, but we are making sure that there is sufficient participation by the government and the producers in all phases of research.

**Matt Dagg** (ISNAR) — I would like to speak about the roles of apex bodies. One goal of the apex body is to ensure better visibility for research. It provides a structure for all the relevant groups to participate. Apex bodies should be transparent so that everyone can see their needs being expressed. It should have important ways of obtaining publicity and demonstrating impact. But this is not so easy to achieve.

**Emilio Madrid** (Chile) — When INIA was first established, it had very low visibility and consequently lacked sufficient domain legitimacy. We began 11 years ago informing producers and government about what we did. We visited them, studied their problems, and tried to provide solutions. When the minister of agriculture took a strong interest in research, we were able to work with him to make our needs known to other ministries and to demonstrate the potential benefit of what we do, e.g., increased production, decreased imports, increased national income. As we proved ourselves, more doors were opened. Three years ago, the minister of agriculture became the chairman of our board. We work in collaboration with the farmers, the universities, and all other groups interested in agricultural growth.

**Charles Razafindrakoto** (Madagascar) — Based on the diagram, I will illustrate how we established domain legitimacy in our institute and in our country. There are three main protagonists:

- the political and financial backers;

- the research and extension personnel;
- the users, operators, and farmers.

To establish confidence, we use information and sensitization. Researchers have to work downwards and upwards.

The ministries of finance, of the plan, and of agricultural production and livestock production are associated in their membership council and in the way they conduct experiments in the field, at the users' level. Research has to take place at the level of agricultural fairs, shows, and exhibitions, and its usefulness has to be proved.

ISNAR gave its diagnosis in 1982, and a structure was set up and implemented in 1983. For research to achieve legitimacy, users should be feeding back information, their needs or requirements. Likewise, decision makers should communicate with the researchers.

**Matt Dagg** (ISNAR) — How did you manage to sensitize the other ministries?

**Charles Razafindrakoto** (Madagascar) — The other ministries were involved via (1) the board of directors (members of the apex body of the council) and, as such, were involved in the program and research activities, and (2) via the Scientific Orientation Council where high-level officials are represented.

**Célestin Belem** (Burkina Faso) — In Burkina Faso, the institute dates from 1978. At first it had no facilities, yet it was charged with coordinating and monitoring research that was carried out in various institutes in different ministries. As a result, there was a duplication of activities and dispersal of efforts. In short, research was no longer effective.

In 1982, the World Bank, FAO, and ISNAR took an inventory of the ongoing research. They sensitized the users of agricultural research, i.e., the ministry of agriculture. A national workshop on policies and strategies identified by agricultural research was set up. In direct contact with the ministry of planning and the ministry of finance, they were able to identify the constraints on research. Eight priority programs were identified during the national workshop, which involved farmers, users, and donors. Five centers were created so as to regionalize research. Then INERA was set up and the agricultural research project was implemented.

Every year, INERA organizes a board meeting that brings together decision makers as well as farmers and the committees. They analyze all the research activities undertaken and the proposed budget. In this way, INERA proves its credibility and establishes its legitimacy. At the level of the centers, there is a technical committee that organizes an annual meeting of all the users and researchers in the area. This committee airs all the results and constraints on the users. This committee also meets regionally. The government of Burkina Faso has thus given research all possible means to carry out its programs. When, at the national level, funds proved to be insufficient, the government took a grant from the World Bank so as to ensure research. Nowadays, we need to be even more credible to be able to match the confidence the World Bank and other bilateral partners have placed in us.

**Matt Dagg** (ISNAR) — Is there any link between the establishment of an apex body and the increased credibility of agricultural research institutions?

**Carlos Valverde** (ISNAR) — In response, I would like to cite the case of Latin America where there are different ways for an apex body to express itself. It all depends upon the visibility of the apex body. In Peru, we have INIA, which does not have a council. There is a head of the national research institute and other bodies (technical advisory committees) which represent the concerns of the bodies as far as the programs are concerned. IMBRAPA (an autonomous and decentralized institute) has no council. Instead, it has a president and three national directors, each one representing a main agricultural zone (humid tropics, tropics, northern part of the country). It is interesting to see how a decision-making body of four persons has been able to set up a network of programs. The success of IMBRAPA is linked to the fact that it decentralized the operations at the level of the federal state within the framework of one organizational structure.

**Dely Gapasin** (ISNAR) — In the Philippines, effective coordination has been the principal means by which agricultural research has enhanced its credibility. PCCARD was set up 17 years ago and has now secured its legitimacy. The creation of this council gave the national system a strong format. There is an agency that supports and coordinates research activities, a government board, and a strong secretariat. Information flows at all levels, including the institutional level. Everything is linked, and the national goals are clearly understood.

**Zafar Uddin** (Pakistan) — In Pakistan, PARC coordinates, orients, and promotes agricultural research. It does not finance research, however. There is also the ministry of food and agriculture which has a division of production and development alongside PARC, whose chairman is also the secretary of the research division. At the provincial level, there are, in addition, agricultural universities and other university departments engaging in research that are under provincial control with funding from the ministry of education.

Directly under PARC, there are 300 researchers who coordinate the activities, manage the production of commodities, train manpower, and set up the libraries, documentation, and publication centers. There is also a board of governors, with 30 to 40 members, whose chairman is the minister of agriculture. Within this very complex structure, it becomes clear that coordination at the national level does not follow at the provincial level. We hope to have the research departments

and the universities working more closely together to improve coordination at the regional level. In fact, we may be working with the World Bank to reorganize our research on a provincial basis, thus facilitating this process. One positive aspect, I might add, is that whereas funds were previously disbursed annually, they are now disbursed every three months, increasing our accountability and enhancing our credibility.

**Ajibola Taylor** (ISNAR) — Nigeria is formed of 21 states, but there is no state research structure. Would it be wise to move to a decentralized system or a centralized system? One problem in particular is the democratization of this system. In Brazil, they have the same situation: there are four people who take all the decisions and who represent the authority.

**Zafar Uddin** (Pakistan) — In our case, there is no centralization. Each group decides for itself.

**Carlos Valverde** (ISNAR) — Dr. Zafar Uddin has raised an important point. Agricultural research institutes are under the umbrella of the ministry of agriculture, while universities belong to the ministry of education. If these two groups have separate policies at the national level, this raises the question of how to forge links between them to ensure a coherent national agricultural research policy.

**Guy Rocheteau** (ISNAR) — It is not easy to conclude this first session in a few words. The problem of the links between NARS and the universities is not solved. Tomorrow we will be able to tackle another aspect of agricultural research — policy issues — during Dr. Senanayake's presentation.

# Issues of Agricultural Research Policy

**Y. D. A. Senanayake**
*Consultant to ISNAR on the Organization and Structure of NARS in Asia*

## Introduction

The policy context, structure and organization, and management of agricultural research are the three pillars that support the 12 critical factors identified by ISNAR for building an effective national agricultural research system. The topic of this presentation is policy.

*Policy* is a deliberate plan of action adopted by individuals or collectively by groups. In a public body, it evolves through a process of conscious deliberation and reasoning. The planning of policy is based on the interaction of facts, beliefs, values, and goals.

As a result of the generation of technology, familiarization with new ideas, better communication, improved education, and changes in the nature of problems, there are also changes in goals, values, and beliefs. The goals of policy also change because of the relative importance of individuals, groups, or organizations interfacing with policy — for example, environmental activist groups in agricultural development.

## Interfaces with Policy

Agricultural research policy flows from a national agricultural development plan (NADP), which in turn takes its cue from a national development policy (NDP). There are two dominant interfacing forces — the socioeconomic process and the political decision-making process.

A number of factors form the policy environment: diagnosis of the socioeconomic situation, an understanding of the government's doctrinal position, and the adjustments dictated by monitoring, review, and evaluation of the implications of previously adopted policies. Based on the work of the group that synthesizes the necessary information, the policy-framing group analyzes and derives proposals for policy alternatives, which are in turn fed into the decision-making process in order to formulate the national development policy. The interactions of the political and administrative arms of government help crystalize this policy. The structural requirements to formulate policy then are these two groups — the synthesizers and the analysts — which are usually part of the national planning body, or form a commission within a key ministry.

Leaving planning and policy-making to emerge from the two main interactive processes alone (namely, the socioeconomic situation and the government's doctrinal position) would be detrimental to agricultural development and advancement. An agricultural research policy group must be in place and be accessible to the national planning body. It should interact directly with the national planning body through a technical subgroup that advises the higher body on possible technologies and anticipated technological breakthroughs within its NARS. The agricultural research policy group must also develop informal links with the political hierarchy so that a rational political doctrine consonant with technological possibilities will emerge. It could also help develop what Bernardo (1989) has called "science statesmanship" which is a research management issue at the national level. He stresses the need for science statesmanship in formulating appropriate national policies to increase investment in agricultural research, rationalize and support a coordinated NARS, strengthen national scientific manpower development and retention programs, and ensure an atmosphere conducive to creativity and innovation. Thus, the influence of the agricultural research policy group on the formulation of the national development policy and its agricultural development plan benefits the research subsector.

## Organizational Mechanisms

The presence or absence of an organization to frame agricultural research policy is a common issue in developing countries. The presence of an apex body in many countries, specifically in South and Southeast Asia and in East Asia, has eased the task of agricultural policy formulation. These apex bodies may be permanent councils, agencies, or boards, or temporary committees. In contrast, countries in Central and

South America commonly have an autonomous or semiautonomous national institute responsible for formulating research policy.

Apex bodies have invariably evolved from the conventional ministry model of agricultural research management. In many African countries and small island nations, such as those in the South Pacific where there is no apex body, a ministry in charge of agriculture or primary industries has to formulate policy through its research arm or with the assistance of a transient policy group. Formulation of agricultural research policy is generally weak in countries following the ministry model. The principal challenge is to develop a permanent mechanism that has the freedom to interact with the political and administrative hierarchies of government.

## Mandate and Constituents of a National Policy Body

The instrument for the formulation of agricultural research policy is an enabling legal enactment, usually in the form of an act of parliament, an ordinance, or a presidential decree or order, which paves the way for the creation of an organization and its supportive structural entities. The definition of the organization's functions, authority, and responsibilities invariably includes the mandate to formulate policy and see to its implementation.

The governing or managing constituents of such a national-level body as defined by law are a diverse group, accommodating different interest groups to ensure that a consensus can be reached on the right policies and their implementation. The constituents invariably include representatives of key development ministries, directorates of research, farmers' and/or producers' representatives, provincial or regional representatives, university academics, recognized scientists, and sometimes political nominees. The number of members varies from a few to as many as 25. Ex officio members constitute from 20 to 75 percent of the constituents in a majority of apex organizations. Their presence ensures that research policy is relevant to national development goals.

The basic structures of an apex organization that are commonly required to plan and develop policy are the secretariat, its technical subdivisions, and ad hoc task forces that it may constitute when needed. Collectively, they are responsible for briefing governing constituents on policy alternatives and their implications.

## Linkages Influencing Policy

The policy environment — composed mainly of the socioeconomic situation and the political process — was identified earlier. The constituents of the agricultural policy group must have links with the political process in order to develop scientific statesmanship and influence policy in favor of scientific opportunities and technological possibilities. This requirement cannot be ignored. Thus, the "top-down" link between national development policy and research should be reciprocated by the "bottom-up" impact of the NARS. Besides these two forceful linkages, many more influence the formulation of policy.

Two broad groups of linkages, one internal to the apex body and the other external to it, can be identified. The internal ones are structures established under the provisions of the legal enactment that created the apex organization. These are the specialist groups, such as commodity teams, technical committees, discipline-focused groups, and panels charged with integrated systems research. They provide advice through the secretariat of the organization.

Invariably, a majority of their members are informed senior scientists who can translate the vision of a national development strategy into scientific opportunities that generate needed technologies.

In contrast, the external linkages that have an impact on the research policy group are varied in organization and structure, and their goals are limited by their special interests. Nevertheless, these linkages are important to the development of a balanced policy. They include users and clients of technology, the ministries responsible for achieving specific development goals, agencies that service agriculture, universities, donors concerned with the realization of project objectives, and interest groups concentrating on issues such as the environment, human values, and social conflicts.

Trends in technological advancement point to the need for good linkages with other apex organizations in order to ensure greater impact and quicker returns to research in fields like biotechnology. Such linkages help countries to benefit from research conducted outside the NARS so that scare resources are not expended in areas where there is no comparative advantage.

Feedback from the research system is needed so that the impact of policies can be assessed, their implementation adjusted, and the policies reformulated in consonance with development goals. Thus, linkages responsible for monitoring, evaluation, and review are essential to the policy process.

## Resource Allocation

Resource allocation is an important policy issue at the national level in a NARS. It guides the direction of long- and short-term research plans by the investment of human resources, physical infrastructure, and servicing segments. A long-term national agricultural research plan is a prerequisite for deciding on resource allocation. In as much as a national development plan defines the agricultural research policy, the national agricultural research plan clarifies the agenda of research priorities.

Research prioritization and resource allocation are required in regard to the importance of commodities in a national agricultural development program and in regard to different production factors. The choice of commodities and production factors has to be made after careful assessment of the opportunities for impact on production.

Besides prioritization of research programs, commodities, and production factors, other opportunities have to be assessed for resource allocation. Among them are integrated systems research, interinstitutional research thrusts, and decentralization of resource allocations. Resource allocation policy can strengthen the integrated systems research by calling for the establishment of new facilities or strengthening existing ones. Interinstitutional collaborative research (either single- or multicommodity, or involving one or multiple disciplines) requires resources to be allocated at the national policy level. Such initiatives are better able to focus on a priority research thrust, and more likely to realize objectives sooner, than a fractional approach to the problem.

Decentralization of resource allocation is necessary if the national apex body has decentralized its activities to the region, states, or other geographically defined area. Once the decentralized research programs have been approved, the responsibility for allocating resources among prioritized programs falls to the regional research administrative office.

## Participation in Research

The extent to which a policy-making body at the national level should participate in the improvement of research is a central issue. A recurring debate centers on the demand for either centralization or decentralization of the policy-making process. Decisions in this regard will be based on whether research is to be of national or regional coverage with central and/or peripheral support in respect to resource allocation. The trend in some countries is to favor decentralization.

On the development of research facilities, policy will dictate the nature of primary structures and their distribution, as well as the selection of facilities for upgrading to centers of excellence. The development of facilities has to be matched to the development of human resources. It is a function of policy to plan the scientific manpower requirement for the NARS, establish standards for recruitment and promotion, and identify training and career-development programs.

Interinstitutional collaboration in agricultural research in developing countries is invariably weak. The need for policies to foster such collaboration and provide resources to support them is an important issue. Closely related to this is the determination of policy for nationally coordinated research projects as well as ad hoc research schemes requiring interinstitutional collaboration and cooperation between the center and the periphery. These types of collaboration have their own built-in constraints. Policies relating to technical and service support, monitoring, review, and evaluation have to be defined to ensure success.

Research done in a NARS should benefit the users and clients of research. Very often, the transfer of technology is ignored by apex organizations. If research is ultimately to contribute to development, facilitating the transfer of technology should be a policy thrust of a national-level organization. When technology transfer is realized, agricultural research policy completes its full course — right through to the final products of such policy initiatives.

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## Discussion by Participants

**Matt Dagg** (ISNAR) — It is important to recognize that donors' participation is an essential aspect of the conduct of agricultural research. The problem we face is how to integrate this support into the planning and priority-setting processes of the NARS. This is where an agricultural research policy group may play an important role.

**Carlos Valverde** (ISNAR) — NARS are indeed helped by donors, but it is important to note that aid comes from different sources and in different packages (e.g., grants and loans).

**Ghazi Hariri** (ISNAR) — Donors have played an important role in establishing apex bodies. But having done so, they often believe they can leave the country to continue with its own policy. Is this the case?

**Y. D. A. Senanayake** (ISNAR consultant) — Resource allocation should be decided at the level of the national agricultural research plan, of the prioritization of the programs, of the choice of the commodities in the national agricultural development plan.

**Ghazi Hariri** (ISNAR) — In Arab countries, apex bodies are not systematically established. The question we should ask ourselves is how we could improve the apex body when it is set up. For instance, in Syria, there is no apex body and no long-term agricultural development plan. They only have perspectives which they examine to see if they can be met. They established a national ad hoc committee which was divided into two subgroups, one analyzing the state of past, present, and future research, the other studying the socioeconomic needs for the year 2010. These two groups are in charge of developing the national agricultural policy.

The second important issue is that if the apex body is there, the director general is also the chairman of the apex body. Carlos has given the example of Brazil where there are three or four apex bodies and the system is working well.

The third issue I would like to tackle is the implementation of the development research policy. To be able to implement it, one needs detailed plans.

**Carlos Valverde** (ISNAR) — In Latin America, where apex bodies exist, they do not really set a policy at the national level, i.e., at the ministerial level. Rather, policy setting occurs in the fora of the various agricultural research institutes that are then linked by the various organizational mechanisms to produce a national research policy or plan.

**Matt Dagg** (ISNAR) — I think an apex body is an important element for visibility in the formulation of research policy (more specifically when there are different ministries involved) and in promoting research statesmanship. The composition of the apex body is important. If one studies the different apex bodies, it is observed that the groups of people can be small or big. Small groups are more dynamic and, hence, useful. However, a larger group has the advantage of securing a wider domain legitimacy by virtue of the increased participation.

**Zafar Uddin** (Pakistan) — I would like to respond to Matt Dagg's very pertinent intervention. We, in Pakistan, had a very large apex body and consequently had to decrease the number of people because there were too many different opinions and conflicting agendas. In a smaller group, it is easier to define the direction for the farmers and the other agencies involved, such as planning and finance. It is easier to monitor a small group.

**Charles Razafindrakoto** (Madagascar) — We have two levels: the apex body (board of directors) which is the decision-making body and the consultative agencies which are called scientific orientation committees. At the level of the chairperson, one has to take into account the orientation and the direction. There are three possibilities: public, entirely private, or in between (semipublic, semiprivate). Hence the importance of the status of the chairperson. This also applies to the members. In the case of our institution (FOFIFA), we are dealing with a public establishment with an individual and private basis. The chairperson comes from the public sector — he is the secretary general of the ministry of research.

It is important to mix properly the number of public and private institutions that influence the decision-making process. Currently there are 10 ministries. In the public sector, we have the ministries of finance, planning, agriculture, and livestock. In the private and semiprivate sector, we have all the ministries representing the private and semiprivate sector. What is important to stress is the fact that at the level of the decision-making process, there must be a limited number of people, whereas at the level of the consultation process, there should be a very wide range of people.

I would also like to come back to the subject of the role of the donors. Donor input must be integrated into a predetermined agricultural research plan which lays out a clear set of priorities and research programs. For political reasons, a government's share of research funding should be significant. If the national contribution is too low, the donors are in a position to dictate. In the Malagasy Republic, the donor meeting takes place at the level between the apex body and the scientific orientation committees. The donors study all the options.

We have 15 different programs (P1, P2, etc.), including different boxes covering investment, operations, training of research personnel, documentation, etc. The consultation committees decide on the number of programs and indicate the funding possibilities. It is only then that the donors intervene. The donors are not allowed to go beyond the boxes that specify our priority programs that need support. And because of this rule, FOFIFA is still the master.

**F. M. Shao** (Tanzania) — How do you inform the donors about your priorities?

**Charles Razafindrakoto** (Madagascar) — In December 1988, we established, with the help of ISNAR, a master plan which was handed to all potential donors. Donors were then consulted. The priorities were established in a concerted way between the users and the research donors. At the beginning of the plan, there were 40 programs. When the master plan was finally adopted, the number had decreased to 17. There are different priority programs: short, medium, and long-term. Donors are thus able to decide how they want to involve themselves.

**Carlos Valverde** (ISNAR) — When you talk about filling the boxes, do donors cover all the "cake" or only part of it? In Latin America, donors want to have all the cake, not parts of it. What is the case in Madagascar?

**Charles Razafindrakoto** (Madagascar) — I can give you two examples:

- USAID took a whole program (rice) and as such monitors the whole process of execution and evaluation.
- There is also the case of other countries, which I won't cite, who favor a scattered financing or a "chunk" distribution. This compels those countries to be more specific.

Another important factor is that there are different kinds of funding systems. You have grants, aids, or loans. The interest rate varies according to the type of funding. If a national institution is well structured and organized, the financial discussions will put the emphasis on grants and nonreimbursable packages, with loans being used as a last resort.

**Dely Gapasin** (ISNAR) — I would like to come back to what Zafar Uddin said about studying agricultural research in the context of science and technology. In the Philippines, at the beginning we had the ministry of agriculture which had to face a lot of constraints. Research had been put aside. Later on, the apex body, PCCARD, was transferred to the department of science and technology where research is the only priority. This department is separated from the ministry and is well able to address agricultural research. Part of the scientific and technological funds were thus geared to support agricultural research. Furthermore, if the apex body is a nonimplementing body, it is perceived by other members of the NARS as preventing conflicts of interest and coordinating things properly. In future, agricultural research will have to be seen in a broader context and universities will have to be brought in. This will ensure a good complementarity. That is why I think a smaller group is more efficient provided the users and the consultative group support the apex body.

**Zafar Uddin** (Pakistan) — Based on the Philippines' experience, I can see why you have established a balance between a wide representation in your apex body and the need for a smaller group to get things done.

**Matt Dagg** (ISNAR) — I would like Dely Gapasin to tell us how many people form the apex body.

**Dely Gapasin** (ISNAR) — There are 10 members.

**F. M. Shao** (Tanzania) — To what extent should donors be involved? In 1978 in Tanzania, the council wanted to split the ministry of agriculture from the ministry of livestock. The World Bank wanted only one body. In the end, there were two parastatal bodies. From 1982 onwards, the World Bank started revising the performance every year. As an outcome, the two parastatal bodies were dissolved and research was handed to one ministry only. This leads me to say that maybe donors should not be involved from the very beginning because it takes even longer to get things done.

**Ajibola Taylor** (ISNAR) — I would like to tackle the question of the involvement of donors in the agricultural research policy formulation. In anglophone Africa, donors have specific views and relations, and consequently create problems. But the main issue is the question of having an identifiable body which is responsible for the formulation of agricultural research policy and which at the same time is recognized because of its availability to link. This is very important. The problem is that in many countries, this question cannot be answered because there are too many individual cases. This body also needs continuity. Ad hoc groups can solve some problems, but in terms of research policy formulation, it is necessary to have continuity. Most national research institutes think they should not be involved and yet they are the only ones who can say what research can do.

**Guy Rocheteau** (ISNAR) — I think that we have covered very well the topic of apex bodies. We have established their efficacy in securing domain legitimacy. We have highlighted, however, the various problems that can arise in managing the trade-off between representativeness and efficacy. Furthermore, there are always likely to be activities that fall outside the scope of the apex body. These include universities and particularly donors' projects and initiatives. We have stressed the need for such bodies to actively engage those partners in the planning of national apex bodies.

# Coordination in National Agricultural Research Systems

**T. Ajibola Taylor**
*ISNAR Senior Research Officer*

Coordination is a principal issue in the organization and management of research. It is important not only in developing countries but also in developed countries with mature institutions and a long tradition of research.

What do we mean by *coordination* in research? We can define it as the attempt to bring all research efforts within a national or regional purview with clearly determined purpose and objectives and where the efforts to achieve the purpose and objectives complement one another. This requires different parts of the system to be aware of the superordinate goals of the system and to be prepared to exchange information and share responsibilities and resources in pursuing these goals. Coordination therefore involves minimizing overlap in functions, sharing goals and focus, and using research resources more effectively.

The need for good coordination has become a major issue in many countries as the number and size of institutions in the research systems have continued to grow, as informal mechanisms of coordination have become more tenuous, and as the resources for research have dwindled. Coordination is clearly linked to the issue of cost-effectiveness since it is expected to lead to more efficient use of resources and to improve the focus of research on clearly defined objectives and output.

There are two major types of coordination: *inter*institutional coordination (among various institutions constituting the NARS) and *intra*institutional coordination (among units within an institution such as departments and program sections).

In the context of the organization and structure of NARS, it is preferable to concentrate on interinstitutional coordination for which a national focus and strategy can be developed. The issue of intrainstitutional coordination can be considered largely a matter of institutional management, to which established management principles and approaches appropriate for research and development can be applied.

Let us consider interinstitutional coordination of a NARS's research institutions with respect to policy and program formulation, program implementation, and the communication of research results. Three types or levels of coordination are distinguishable: atomistic behavior, low-level coordination, and high-level coordination:

- *Atomistic behavior* is characterized by the absence of any explicit framework of coordination between research institutions. Any interaction is incremental, achieved through mutual adjustments.

- *Low-level coordination* is characterized by situations where institutions develop and pursue their plans independently and only subsequently discuss those plans in relation to set criteria.

- *High-level coordination* is characterized by the attempt to ensure that resources are allocated and used according to set national and technical criteria and with optimum effect in terms of overall national agricultural development objectives.

Among the many issues involved in coordination, four major ones are worth focusing on here:

### Issue 1: Institutional Composition of NARS

Depending on our definition of a NARS in a particular country, the issue can be simple or complex. For example, if there are several institutions in several ministries (as in Sri Lanka), then the issue of coordination seems to loom larger than when one department or division of agricultural research constitutes the NARS (as in Lesotho and Botswana) or when the mandate for agricultural research is given to one national research institute (as in Kenya), whether autonomous or semiautonomous. Whether universities, private-sector institutions, and other players are included in the definition also affects the complexity of the issue.

The subissues of importance in these situations are

- Division of labor — Are the research functions clearly assigned to each of the institutions in the NARS so that there is minimal or no overlap?
- Who and for what? — Are the institutions themselves clearly identified and is the purpose or client of research clearly established?
- Public/private — Is there a balance between public and private research such that adequate coverage of the required scope of research is ensured?
- Development projects — Are there elements of research in the development projects and are these considered within the stream of national research?

**Issue 2. Determination of Mandate**

To facilitate coordination, there should be clearly determined mandates for the various institutions in the NARS. These mandates determine the mission and the mission statements of the institutions. The pertinent question is whether there are clearly established mandates for various institutions and whether these mandates are widely known and recognized within the system.

For example,

- Regional mandates (e.g., for agroecological zones) for zonal research centers being put in place in Tanzania. Also, for IAR Zaria, Nigeria, regional and zonal mandates were clear (northern Nigeria region, Savanna, and northern Guinea savanna zones). This was also true for IAR & T (S.W. Nigeria region and Southern Guinea and rain forest agroecological zones).
- Commodity mandates, e.g., maize, rice.
- Research type, e.g., basic, applied, adaptive.
- Research scope (scope and type of research are closely related but access to research results and information and materials from elsewhere are important considerations).

**Issue 3. Structures and Mechanisms**

The structures and mechanisms available for coordination range from ad hoc to formal mechanisms at national, regional, and international levels.

The following are the most commonly used formal and ad hoc structures and mechanisms:

- apex body (responsible for coordination);
- senior management of semiautonomous institutes;
- information and communication (mechanism for sharing) leading to mutual adjustment;
- administrative supervision — institutional, program, or project levels;
- joint programs and activities;
- thematic coordination;
- commodity coordination;
- project coordination (project coordination unit);
- national coordination (nationally coordinated research projects);
- review procedures for current and new research (ad hoc task forces).

**Issue 4. Coordination of Donor Input**

Donor inputs are additional to the inputs of resources and programs in NARS. Sometimes donors have their own priority areas of interest. NARS must have mechanisms to be able to negotiate, coordinate, or integrate these within the national research program. This is often facilitated when there is a national strategic plan for agricultural research. Otherwise donor inputs, although additional, may not necessarily complement the other research efforts to focus on the primary purpose of the NARS.

Donor inputs need to be coordinated at both the implementation level and the organizational strategic level. NARS should be in a stronger position to negotiate with donors and guide donor inputs into priority areas for research.

Apart from interinstitutional coordination, there are areas of intrainstitutional coordination to consider. Issues of concern to management in this regard include

- mechanisms for planning and coordination;
- disciplinary versus program organization;
- stimulation of interdisciplinary research;
- sharing of multidisciplinary facilities;
- team building.

## Discussion by Participants

**Ghazi Hariri** (ISNAR) — Intra- and interinstitutional coordination often overlap. It might be interesting to have concrete examples from the participants.

**Carlos Valverde** (ISNAR) — If we consider Latin America, the main difference in the types of coordination found in the various countries is the range and extent of activities to be coordinated. Much of this will depend on the political and bureaucratic structure in each country in addition to the way research itself is organized.

**Ghazi Hariri** (ISNAR) — I would like to follow Carlos Valverde's intervention with an example from WANA. At the end of the fifties, beginning of the sixties, there used to be the national level, the regional level, and an association with the international networks (for instance, the FAO regional project for improvement of wheat in which CIMMYT was involved). In 1976, two regional centers were established: the Arab center for the dry area and ICARDA. The coordination of these two centers is different.

In Egypt, a five-year plan was started in 1982. There was one agricultural research center with 15 stations (which were commodity- and theme-oriented in the capital) and 10 regional stations (only commodity-oriented). As such, it was very difficult to coordinate research. A mutual adjustment was the basis of the coordination of research. In the period 1982-86, 12 programs were established in which there were two different coordination processes: the commodity or national coordination and the thematic coordination.

**Ajibola Taylor** (ISNAR) — I would like to come back to donor coordination. In Kenya, there is a conceptual and intellectual interaction in establishing a need for a plan and a national or regional strategy. Donors and international organizations elaborated this strategy with the nationals. They set up a national task force involving scientists, policymakers, and different ministries which focused on the terms of reference developed by the ministries as the basis of the national research strategy. At the same time, the donors (18 representatives) were kept informed of the development of this strategy during the monthly meetings. The donors began to anticipate the areas in which the priorities should be taken. The task force had a strong intellectual impact. The second major input of the donors confirmed their willingness to assist in the development of a national research plan. Kenya organized a meeting/consortium, bringing together all international donors involved. In such a system, it is easier to get more funds from the donors.

**Zafar Uddin** (Pakistan) — In Pakistan, there is a federal government with very strong provinces. There are agricultural departments both at the federal and at the provincial levels with much competition. There are 33 coordinated programs funded nationally. However, PARC is not a financing body. We can only promote coordination.

**Ajibola Taylor** (ISNAR) — Are there any coordination linkages?

**Zafar Uddin** (Pakistan) — They are difficult to assess as there is a problem with the definition of the subgroups.

**Ghazi Hariri** (ISNAR) — There is a need to have political will and incentives to coordinate the programs. In this case, there is no political will, which explains why there is no incentive at the level of the provinces.

**Zafar Uddin** (Pakistan) — The question of mandate is very important. We prepared a master plan involving all the parties.

**Matt Dagg** (ISNAR) — Coordination requires time and people as there are so many steps involved. One should maybe decide on the priority which should be given to some coordination steps.

**Dely Gapasin** (ISNAR) — The case of the Philippines is quite complex. It involves a lot of steps and all are not necessarily successful at the same time. Coordination is made according to the needs of the moment, some within the apex body, some at the lower levels.

**Charles Razafindrakoto** (Madagascar) — I would like to show you some diagrams. The first one is of the six provinces of Madagascar indicating all the stations and the corresponding field of activities. The second one shows the organigram of FOFIFA. Coordination involves three issues:

1. Structure. The main activities (from the apex down to the bottom of the ladder) are mentioned on the vertical lines, copying the hierarchy of the structure of FOFIFA and its responsibilities.

2. People. A beautiful structure requires good people with clearly defined tasks.

3. Mechanism. This is easy to implement but difficult to operate. To control information is also difficult; it supposes formal or informal meetings and the setting up of a support structure which helps to control the information. Coordination is only one element of the management process. To have good management, one needs good planning, control, direction, staff, and coordination.

**F. M. Shao** (Tanzania) — In 1974, there were 12 commodity coordination programs. Nowadays, there are 20 programs dealing with crops and 30 with livestock. We also have zonal coordinated programs. At the national level, there is a supervision system but there is none at the zonal level. Tanzania has zonal committees which could be compared with the one at the national level. For the moment, things are not very clear. And during the preparation of the master plan, things should be specified. As you can see, coordination takes place at the level of the research institute. However, utlimate responsibility lies with the research coordinator.

**Carlos Valverde** (ISNAR) — How do you integrate region-based coordination with that of the national institutes and experimental stations?

**F. M. Shao** (Tanzania) — They are members of a single coordinating committee and as such are in a position to develop a common plan.

**Emilio Madrid** (Chile) — I definitely favor coordination occurring at the lower level of the structure even at the level of the stations. This consensus should then be transmitted upwards to the apex body in a bottom-up approach.

**Matt Dagg** (ISNAR) — In the case of Chile, is there coordination with the private sector and how is that facilitated by your lower-level approach to coordination?

**Emilio Madrid** (Chile) — In cases where a particular component of the NARS identifies relevant work being done by private research, they establish complementarity and scale down their efforts in those areas, thus avoiding duplication and conserving scarce resources.

**Matt Dagg** (ISNAR) — I think the size of the research system has an important influence on the way coordination can be handled. For example, how many researchers are there in Tanzania?

**F. M. Shao** (Tanzania) — In Tanzania, we have 300 researchers, which means that there are about 10 researchers per coordinated program, although Dr. Taylor has suggested that this number is going to change in the near future as we develop our master plan for national agricultural research.

**Ajibola Taylor** (ISNAR) — I think it is very important to stress the free flow of information that must lie at the base of any coordinating mechanism.

**Dely Gapasin** (ISNAR) — I would like to also emphasize the role that linking coordination to funding has. In the Philippines, there is only one council for nationally funded research that is involved in the financial allocation for all the institutes; hence, the existence of coordination. I suggest that this experience be considered by others.

**Ajibola Taylor** (ISNAR) — To conclude this session, I would like to stress the following points:

- There are different mechanisms of coordination taking place at different levels. We have seen that funding is also important in coordination.
- For a system to be able to work, one needs a flow of information.
- The apex body should translate the coordination function to the other levels.
- The transfer of coordination can lead to more precision in the research plans.

# Decentralized Public Institutions: The Latin American Model

**Carlos Valverde**
*ISNAR Senior Research Officer*

## Introduction

Centralization of economic planning, intervention, execution, and control has been generally regarded as highly desirable in most of the economies in the Third World, especially during the 1940s and early 1960s. Agricultural research did not progress well under these conditions, in part because of the low priority given to research. As a consequence, limited financial resources were allocated. A more significant constraint, however, was lack of administrative flexibility and excessive management by government officials.

During the 1970s and early 1980s, governments began decentralizing some development planning and management functions. They did so because of dissatisfaction with centralization and because the underlying rationale of international development strategies changed during the 1970s.

By the end of the 1960s, most of the developing countries, especially in Latin America and the Caribbean (LAC), were facing a variety of financial problems caused mainly by decreasing levels of exports and rising prices for energy and, particularly, imported goods. To make things worse, foreign assistance was becoming increasingly scarce.

Because of these factors and the limited resources available to maintain centralized economies and governments, particularly large federal systems, some countries became interested in finding ways to use their resources more effectively. Decentralization appeared to be an alternative.

In strengthening national research activities, technology development, and capabilities, a number of LAC countries have decentralized research activities by setting up semiautonomous or autonomous bodies linked to government through the ministry of agriculture.

This paper discusses the creation of decentralized semi-autonomous and autonomous agricultural research institutes, focussing on the administrative flexibility that results from the autonomy given to the institutes by their ministries of agriculture.

## Decentralized Institutions in Latin America and the Caribbean

In Latin America and the Caribbean, after the Second World War and during the decades of the 1960s and 1970s, deliberate political decisions were made to expand agriculture and to grant necessary governmental provisions to support structural and organizational changes, not only in agriculture, but also in education, health, and housing.

Regional and international contributions of technical and financial assistance were emphasized during this 20-year period to bring agriculture up to date. (An important role was played by the Rockefeller and Ford Foundations, the International Development Agency [Agencía Internacional para el Desarrollo — AID], United Nations special funds, resources from the Inter-American Bank, agencies for cooperation [FAO, CEPAL, ECLA, IICA], and bilateral aid from Canada, Great Britain, Sweden, Switzerland, and Germany.) This injection of international technical assistance had a dramatic effect on the shape of agricultural research institutions. The international agencies and scientific community included scientific and technological aspects within their jurisdiction; apart from offering straightforward scientific and technical backstopping, they brought in bilateral and political economic support.

The reorganization of research and the adoption of decentralized institutes as structural models was the general pattern in the 1960s. Apart from Argentina, decentralized institutes were created in Ecuador, Mexico, Colombia, Chile, Guatemala, Brazil, Venezuela, Panama, and Bolivia.

Although adapted to each country's particular conditions, an autonomous institute had the following characteristics:

- administrative and financial autonomy, organizationally separated from the ministries' central administration;
- national, though regionalized, coverage;
- institutionalized systems and mechanisms for planning, programing, follow-up, evaluation, and budgeting;
- decentralized organization;
- mechanisms to link and/or integrate research and technology diffusion with the producers;
- adaptive research as the main objective, oriented towards resolving the most important problems of the producers;
- mechanisms for intra- and extrainstitutional coordination with other public or private organizations;
- mechanisms for the participation of producers in the diagnosis, planning, and prioritization of research activities.

With the adoption of a decentralized institute model by Peru in 1978, Guyana in 1984, the Dominican Republic in 1985 (not yet implemented), and Uruguay and Paraguay in 1989, it could be said that the more recent landscape is characterized, particularly on the South American continent, by the predominance of a model that distinguishes a decentralized institution from the central administration of the ministries of agriculture. Although these institutes bear a structural resemblance, their size, organization, and judicial format vary from country to country, particularly in terms of administrative autonomy and the extent of linkages with the ministries of agriculture. Table 1 lists selected decentralized institutions in Latin America and the Caribbean. Figure 1 outlines the evolution of organizational models in the region.

The decentralized institute model in some ways resembles a professional bureaucracy (Mintzberg 1973). However, it is important to note again that institutes vary from country to country as a result of differences in their size, life cycle, relationships with other research institutes, dimension of the agricultural sector they serve, and types of crops and producers they work with, as well as differences in the demography and distribution of crops in the country, the availability of arable land, and the degree of urbanization and industrialization.

Consequently, the institutional, structural, and organizational scenario with regard to agricultural research in the LAC region is not at all straightforward — it is, in fact, highly complex. Operationally speaking, each country has a series of limitations that are directly related to the juridical-administrative

**Table 1. National research Institutes Created Since 1957 in Latin America — Administrative Autonomy**

| Acronym | Name and Year | Country | Autonomy |
|---|---|---|---|
| INTA | Instituto Nacional de Tecnología Agropecuaria (1957) | Argentina | Semiautonomous |
| INIA | Instituto Nacional de Investigación Agropecuaria (1961) | Mexico | Semiautonomous |
| INIFAP | Instituto Nacional de Investigaciones Forestales y Agropecuaria (1986) | | Semiautonomous |
| ICA | Instituto Columbiana Agropecuaria (1962) | Colombia | Semiautonomous |
| EMBRAPA | Empresa Brasileira de Pesquisa Agropecuaria (1973) | Brazil | Autonomous |
| FONAIAP | Fondo Nacional de Asistencia y Investigación Agropecuaria (1973) | Venezuela | Semiautonomous |
| INIA | Instituto Nacional de Investigación Agraria (1978) | | Semiautonomous |
| INIPA | Instituto Nacional de Investigación y Promoción Agraria (1981) | Peru | Semiautonomous |
| INIAA | Instituto Nacional de Investigación Agropecuaria y Agroindustrial (1987) | | Semiautonomous |
| INIA | Instituto Nacional de Investigación Agropecuaria (1964) | Chile | Autonomous |
| CIAAB | Centro de Investigaciones Agricolas "Alberto Boerger" (1961) | Uruguay | Autonomous |
| INIA[1] | Instituto Nacional de Investigación Agropecuaria (1989) | | Autonomous |
| IBTA | Instituto Boliviano de Tecnología Agropecuaria (1975) | Bolivia | Semiautonomous |
| INIAP | Instituto Nacional de Investigación Agropecuaria (1959) | Ecuador | Semiautonomous |
| ICTA | Instituto de Ciencia y Tecnología Agricolas (1973) | Guatemala | Semiautonomous |
| INTA[2] | Instituto Nacional de Tecnología Agropecuaria | Nicaragua | — |
| IDIAP | Instituto Nacional de Investigación Agropecuaria de Panamá (1975) | Panama | Semiautonomous |
| IDIAA[3] | Instituto Dominicano de Investigación Agropecuaria | Dominican Republic | — |
| NARIG | National Agricultural Research Institute of Guyana | Guyana | Semiautonomous |
| NARIJ[4] | National Agricultural Research Institute of Jamaica | Jamaica | Semiautonomous |

Source: Various sources, modified and updated by C. Valverde.

1. The law creating INIA is under discussion at the Uruguayan Congress level.
2. Research activities were initiated in 1979 by the administrative system of the ministry of agriculture.
3. Not implemented.
4. In the process of being implemented.

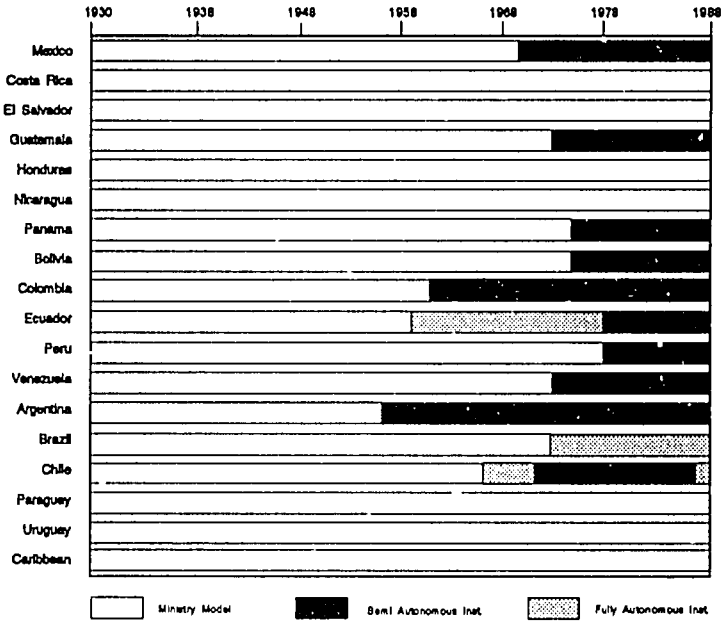


**Figure 1. Historical evolution of organizational models in Latin America and the Caribbean**

procedures and the style and tradition of political administration within the context of federal or unitarian government. Whereas some models must be adapted to conditions of intense urbanization and abundant arable land (Mexico, Argentina, Colombia, Brazil, Venezuela, and Uruguay), in other cases, they must conform to a situation where arable land is limited, the economy is heavily agricultural, and there is little possibility of adapting a wide variety of crops which, in many cases, are only annual. To summarize, it could be said that there is little scope for operation.

The current capacity of national systems is shown in Table 2. Indicators for 1980-85 give an idea of the available personnel and financial resources in the LAC countries. Although these data are not intended to indicate the structure and organization of agricultural research, they do demonstrate the size and degree of specialization of the different systems.

## Administrative Flexibility

The concept of autonomy relates to the delegation of authority and distribution of power, and has legal, administrative, and organizational aspects. Autonomy has direct repercussions on the size, hierarchy, authority, complexity, specialization, and centralization or decentralization of an organization. The greater the degree of autonomy, the more the organizational variables tend to search for maximum expression, and decentralization becomes imperative.

### Autonomy

In this section, we shall attempt to analyze the concept of autonomy as an expression of the administrative flexibility acquired when decentralized organizational structures, such as the LAC Institutes, are created.

Beginning with the premise that total autonomy is nonexistent within a public or semipublic system, it could be said that, functionally, a decentralized public institution is autonomous insofar as it has the authority to organize, plan, budget, and execute the research activities delegated to it. In other words, it is autonomous in terms of its direction, administration, management, and operation, always taking into account that these activities are in keeping with the socioeconomic development policies of the country and agricultural sector.

In the case of the LAC region, the degree and type of decentralization of central government research activities range from decentralized autonomous bodies (EMBRAPA–Brazil and INIA–Chile), to decentralized bodies strongly tied to the central and bureaucratic semiautonomous system of the state (INIAP, IBTA — see figure 1). Between the two extremes lie different degrees of dependence on the central government. Regrettably, no clear and convincing indicators have been developed to distinguish an autonomous decentralized institution from a semiautonomous one. Thus, a decentralized institution is not necessarily autonomous in terms of its administration, management, and operation.

**Table 2. National Agricultural Research Resources — Expressed as 1980-1985 Averages**

| Country | Personnel[1] | Agricultural Research Expenditures[2] | Agricultural Research Expenditures per Capita[3] | ARI[4] | Qualification Index[5] |
|---|---|---|---|---|---|
| **Northern Region** | | | | | |
| Mexico | 1030 | 127.17 | 123 | 0.51 | 0.29 |
| **Central American Region** | | | | | |
| Costa Rica | 114 | 3.29 | 29 | 0.24 | |
| El Salvador | 106 | 4.45 | 42 | 0.24 | |
| Guatemala | 150 | 7.40 | 49 | 0.22 | 0.17 |
| Honduras | 68 | 1.55 | 23 | 0.17 | 0.25 |
| Nicaragua | 57 | 3.61 | 63 | 0.29 | |
| Panama | 105 | 5.92 | 57 | 1.17 | 0.33 |
| Subtotal | 600 | 26.23 | | | |
| Average | | | 44 | 0.39 | 0.25 |
| **Andean Region** | | | | | |
| Bolivia | 107 | 3.36 | 30 | 0.22 | 0.30 |
| Colombia | 448 | 46.09 | 106 | 0.36 | 0.51 |
| Ecuador | 209 | 14.06 | 69 | 0.54 | 0.30 |
| Peru | 265 | 18.66 | 52 | 0.56 | 0.12 |
| Venezuela | 383 | 40.37 | 91 | 1.01 | 0.40 |
| Subtotal | 1412 | 122.55 | | | |
| Average | | | 87 | 0.54 | 0.33 |
| **Southern Region** | | | | | |
| Argentina | 1063 | 62.57 | 65 | 0.52 | 0.17 |
| Brazil | 3622 | 300.55 | 88 | 0.86 | 0.60 |
| Chile | 269 | 26.55 | 99 | 0.95 | 0.37 |
| Paraguay | 70 | 7.13 | 98 | 0.44 | 0.41 |
| Uruguay | 76 | 4.22 | 55 | 0.39 | 0.22 |
| Subtotal | 5100 | 401.02 | | | |
| Average | | | 79 | 0.63 | 0.36 |
| **Caribbean Region** | | | | | |
| Antigua | 5 | | | | 0.69 |
| Bahamas | 25 | | | | 0.49 |
| Barbados | 48 | 1.82 | 38 | 2.59 | 0.40 |
| Belize | 15 | | | | |
| Bermuda | 6 | | | | 0.86 |
| Cuba | 2191 | | | 3.92 | |
| Dominica | 6 | 0.17 | 34 | | 0.33 |
| Dominican Republic | 121 | 3.80 | 34 | 0.19 | 0.18 |
| Grenada | 3 | | | | 0.67 |
| Guadeloupe | 14 | | | | |
| Guyana | 53 | | | | 0.41 |
| Haiti | 32 | 1.62 | 51 | 0.13 | 0.94 |
| Jamaica | 49 | 2.40 | | 0.77 | 0.55 |

Table 2. (continued)

| Country | Personnel[1] | Agricultural Research Expenditures[2] | Agricultural Research Expenditures per Capita[3] | ARI[4] | Qualification Index[5] |
|---|---|---|---|---|---|
| | 7 | | | | |
| **Caribbean Region (cont.)** | | | | | |
| Martinique | | | | | |
| Montserrat | 3 | | | | 0.42 |
| Puerto Rico | 84 | 9.06 | 108 | 2.38 | |
| St. Kitts-Nevis | 5 | 0.06 | 16 | 0.80 | 0.47 |
| St. Lucia | 21 | 1.79 | 85 | | 0.52 |
| St. Vincent | 5 | | | | 0.37 |
| Suriname | | | | | |
| Trinidad & Tobago | 53 | | | | 0.52 |
| Virgin Islands (US) | 6 | 0.39 | 67 | | |
| | 2750 | 21.10 | | | |
| Subtotal | | | | | |
| Average | | | 8 | 1.54 | 0.52 |

1. Personnel and Agricultural Research Expenditures: Pardey and Roseboom (1988).
2. Agricultural Gross Domestic Product (AgGDP): UN (1988).
   Agricultural Research Expenditures: Expressed in millions of 1980 US$. Expenditures were first deflated to constant 1980 currency units using an implicit GDP deflator (UN 1988). They were then converted into 1980 US$ using PPP over GDP indices from Summers and Heston (1988).
3. Agricultural Research Expenditures per Scientist: Agricultural Research Expenditures / personnel (in thousands of 1980 US$).
4. ARI (Agricultural Research Intensity Ratio): Agricultural Research Expenditures / AgGDP (in percent).
5. Qualification Index: PhD + MS / total scientists (inclusive of expatriate personnel, who are assumed to hold a higher degree).

Depending on their legal status, most decentralized bodies in LAC are in one way or another compulsorily subordinate to or linked to the ministry (agrarian sector) in all that refers to the strategies, policies, and priorities established by the minister of the sector and to the coordination of the programing, budgeting, execution, and evaluation of the results.

In practice, however, coordination in extreme cases has been converted by the ministry into an excess of control measures, resulting in the disappearance of the operative and administrative flexibility of the decentralized institute. Consequently, the administrative status of the decentralized body does not differ in any way from that of any other department acting within the norms governing the ministry or public departments of the central government.

To be more precise, anything in the Latin American and Caribbean NARS concerning the structure, organization, and management of financial and human resources generally operates entirely within the norms of the ministries of agriculture and finance as well as the national regulations on personnel management. (There are rare exceptions regarding the degree of their influence, such as in the cases of EMBRAPA–Brazil and INIA–Chile.) These norms and regulations are suited to routine office work, but they are not flexible enough to accommodate exceptional situations such as those involved in agricultural research activities.

Research by nature deals with biological entities and complex ecological systems. It needs constant personal attention and a flow of physical resources, specific and not always predictable research materials, and a time schedule not always subject to rigid fiscal calendars. For example, laboratory and field experiments need constant attention which does not fit into the strict routine established for professionals and technicians working within the central bureaucratic system.

Without going into budgetary details, it may be said that, under the central government system of budgetary allocation and payment of most LAC countries, the activities related to research involving biological entities and dynamic ecological systems are compatible with budgetary execution. The common problem encountered is that neither the allocation of resources nor the calendar of payments conforms to the needs of the research calendar.

In other words, the element of administrative flexibility is absent or limited with regard to the operation and allocation of the physical, financial, and human resources necessary to execute the research activities.

It would seem that a feasible alternative would be to grant real autonomy to the decentralized institutes in terms of a series of exceptions to the laws, which, without surpassing any legal framework, would permit them to implement measures to

increase their level of flexibility, efficiency, and effectiveness in the management of available resources. It would also allow them to attract and manage additional resources.

Autonomy, therefore, appears to be a precondition to taking the measures needed to allow the implantation of salary structures — *escalafones* — and fiscal systems according to the research activity. These are the basic elements needed to end the decline and continuous drain of talent that is becoming more and more acute within the research scene. Notable examples are ICA–Colombia, EMBRAPA–Brazil, and INIA–Chile, which have obtained special research concessions to enable them to retain skilled and experienced researchers.

*Autonomy: Where and Why?*

To grant administrative autonomy to the decentralized institutes does not necessarily mean changing the character of public entities linked to the sector. Quite the contrary — this would strengthen their capacity as strategic bodies in the development of the sector.

Decision makers should realize that granting autonomy does not only involve delegating authority and power to the highest hierarchic level but it also includes freeing up central management to make administration possible. In this sense, administrative autonomy should not be thought of as a separation from the ministry where the institutes make decisions outside the framework of national laws. Rather, it is the basic condition for their efficient and effective functioning in terms of the means and resources placed at their disposal by the state government.

The following are the functional and/or activity areas where administrative autonomy appears to be needed in a NARS and where careful ad hoc as well as formal implementation of organizational mechanisms and instruments is required.

*Generation and Management of Income*

All NARS generate some kind of financial resources that are classified as their own resources. These resources should be mobilized in the form of reinvestments in research activities and should not be subject to ministerial norms that inhibit opportune and adequate utilization. The NARS should, for example, be allowed to establish sufficiently flexible rotating funds for the production of improved genetic materials, both plants and animals, as well as support to maintain these services. These funds would not only provide an economic basis for programing, but they would also fulfill the ever-growing demand for improved material and services.

Aside from sufficient flexibility and autonomy, there should be mechanisms for the NARS to attract additional resources, such as those available from producer organizations. Examples of this include the model developed in support of CIANO in Mexico, FUNDEAL in Peru, and private foundations in Ecuador, Jamaica, Dominican Republic, Peru, and Honduras. Other ways of generating additional resources include the formation of joint ventures with public- or private-sector organizations (similar to those being initiated at INTA–Argentina and EMBRAPA–Brazil) or royalties and premiums for patents of new technologies (varieties, methodologies).

*Establishment and Maintenance of a Wage Scale for Researchers*

The necessary mechanisms and organizational structure should be in place to develop and implement policies and strategic actions for a human resource management plan. As part of the development of this plan, a remuneration system (*escalafon*) should be established and operated in accordance with research output and the relevance of results, thus avoiding the continuous loss of experienced and talented researchers and collaborators from the system.

*Decisions about International Technical Cooperation*

Research systems must have the necessary autonomy and the capacity to make decisions about technical assistance in support of and/or complementing the approved national research plan. The often lengthy and unnecessary red tape of the central system's approval process for technical and financial cooperation approval should be avoided.

*Flexibility for Travel Abroad*

To retain the necessary high degree of specialization throughout the NARS, qualified personnel must maintain a continuous interchange of experiences and information at the global level. This requires that researchers have the flexibility to travel abroad, whether for further training or to attend meetings, seminars, and workshops. This is absolutely essential to preserving the relevance and quality of research.

To take maximum advantage of travel opportunities, the system must allow immediate approval of travel on short notice. The present bureaucratic system, which is slow and ponderous, not only impedes human resource development, but it actually prevents additions to the institute's knowledge base. INIA–Chile is a good example of an efficient system — the president of the directorate makes the decision and the travel process is soon expedited.

*Hiring Consultants*

Apart from increasing the relevance of research, efficient use of expertise within the NARS is extremely important to the process of evaluating the impact of research. This use of experts should also include the option of hiring outside consultants as required, which would not only benefit individual researchers but also the institution.

*Flexible Budgetary Execution*

As a consequence of a lack of administrative autonomy, the area of budgetary execution is one where an excess of control is likely to occur, resulting in ineffective management and inadequate programing. Nevertheless, it should be realized that institutes must substantially improve not only their mechanisms for budgetary formulation and allocation, but also those relevant to effective operation. It is thus necessary to design and adopt a mechanism that is flexible and relatively simple — procedures whose main objective is to provide the research with resources at the right time and in the right place.

*Management of Donor Resources*

This category includes the capacity to negotiate, process, and manage grants and donations that result from technical and financial cooperation.

*Flexibility in Making Contracts and Procuring Goods*

The authority for drawing up and signing contracts for financial and technical assistance should be delegated. This also includes the responsibility for purchasing equipment and materials and for overseeing the bidding process.

The points listed above are just some of the areas in which the decentralized institutes need administrative flexibility and autonomy.

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## Discussion by Participants

**Dely Gapasin** (ISNAR) — In the Philippines, a decentralized agricultural research institute was set up in 1972 as the government wanted to give more autonomy to regional agencies and focus research programs on regional needs. The system is very dispersed because of the geography of the country. At the regional level, a consortium was formed in 1975. It was a strategy to establish a network of institutions to regionalize research management. The number of agencies varies per region. The composition of one agency reflects the national structure. Fourteen years ago, the consortium was center-oriented and linked its activities with the other consortia. Thanks to this system, the effort is focused on regional needs, participation is more active, there is a sharing of activities, and the link with nongovernment centers has been strengthened.

**Emilio Madrid** (Chile) — INIA was set up in 1964 as a private corporation (50 percent of the budget comes from the government and the remaining from other funds or private organizations). It employs 1300 people and has a board of directors of seven members. In 1982, a strong minister was appointed for a period of six years; he was respected by the others. The mandate of the institute is to transfer technologies, and researchers have to dedicate 25 percent of their time to this. In the same way, technology transfer workers spend 25 percent of their time in research.

In 1977, the extension service disappeared. In the new system, farmers could exlain their situation (hopes and problems). Technology transfer workers went to see the farmers and established personal contacts. When a problem appeared, the farmer would explain it to the technology transfer workers. If it could not be solved immediately, they worked out a solution together during the next visit (scheduled a month later).

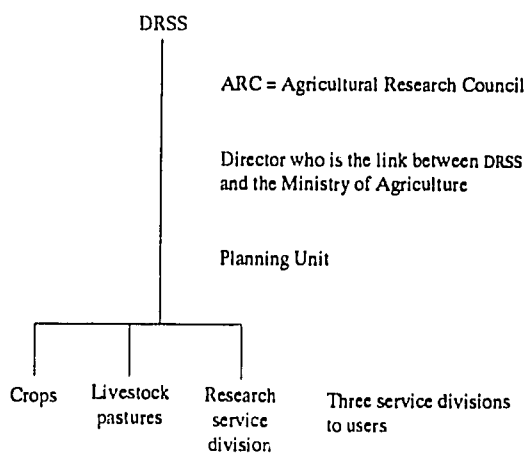
The government gave a lump sum to INIA, but it was only enough to cover 80 percent of the salaries. The rest came from private companies or from selling of the products. INIA is free to manage its budget and formulates it internally. There is no external control. Administrative mechanisms are flexible but there are strict procedures for accounting for funds and staff recruitment. In 1980, the government issued a list of programs and INIA is dealing with that list. I am totally free to do whatever I feel like doing. For instance, I did not have to ask permission to attend this workshop. I only had to inform the government of my decision. The only thing I cannot do is sell property.

The human resource department is also autonomous. The program is set up at the level of the directors. In 1985, an earthquake destroyed half of the stations and all the equipment was destroyed. We received a loan from the Inter-American Development Bank to help us replace the equipment.

Next year, the government is going to reduce our budget. The IADB will stop financing and the government will have to take action. This is where the problem lies. However, I would like to stress the fact that our situation is different from other countries because we do not have that many researchers.

**Ajibola Taylor** (ISNAR) — There are two different models:

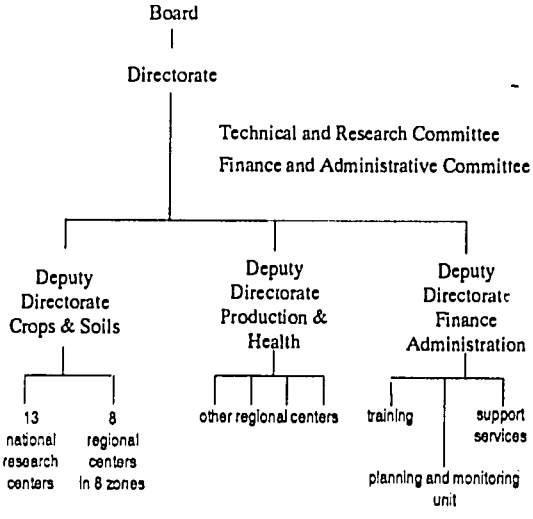
- Zimbabwe. DRSS (Department of Research and Specialized Services) is the research department within the ministry of agriculture. It is flexible in terms of structure and function to plan, manage, and coordinate agricultural research.




There is a network of stations set up in the different zones and targeted according to the small-scale commercial and common farmers. The clientele is clearly defined, as are the services to which the users can address their problems. ARC is an independent body that advises the ministry of agriculture on the program of DRSS. ARC is an advisory body to the government, as it considers the program requests from the three other departments. This is an example of a department of agriculture within the

ministry of agriculture that can decide for itself. It is successful because it is simple and because ARC plays an important role as it brings together the different parties. ARC can carry out specific studies and refer to the government at a later stage. How can this system be strengthened? One possibility is to give the opportunity to a specific body to plan and analyze the information made available to it, i.e., the planning unit.

- Kenya. KARI (Kenyan Agricultural Research Institute) is an autonomous research institute which has legal status. This is where they plan, manage, and coordinate agricultural research. In 1979, there was an act of parliament which set up the national council for science and technology. KARI has responsibilities for planning, organizing, and coordinating research, for mobilizing resources, and for supporting agricultural research nationally and internationally. A board of 12 members was set up and is responsible for research policy and the guidance of the institute's research.




It is obvious that links have to be established between the eight regional centers and the other regional centers.

KARI should strengthen and seek a scheme of activities so as to attract donor resources. But there are several problems: it is a semiautonomous institute outside a ministry. Firm links have to be established with the ministry of agriculture. The links have to be established with research and extension (specific importance has to be given to this topic).

**Carlos Valverde** (ISNAR) — So it appears that it is not always necessary to have legal status. Example: Zimbabwe.

**Charles Razafindrakoto** (Madagascar) — I think that Chile provides us with an example of genuine autonomy. The social, economic, historical, and political factors all play a role in the consolidation of autonomy. People matter a lot — personalities can strengthen autonomy. More particularly, the relation between Emilio Madrid and the minister. This might change later if there is a change in personnel.

Provided everybody sticks to the legal status and the role of the institute which have been defined, autonomy is increased even more. When the situation is not clear between the central administration and the institute, autonomy is utopian.

**Matt Dagg** (ISNAR) — In the case of Chile, one has to make a distinction between management of the means of carrying out research and the management of research. Can farmers check the programs? In other words, can the lower scale effect the control of research, meaning herewith that the institute is not totally autonomous? It is the same with Zimbabwe where there is control but no means of carrying out research. The same goes for the other apex bodies in Asia (the Philippines and Sri Lanka). I wonder if there is an example of an institute with real autonomy in the management of research?

**Ajibola Taylor** (ISNAR) — We must remember that research institutes receive most of their funds from public sources. Therefore, we are talking about semiautonomy not only in relation to the means of carrying out research, but also in relation to the freedom to determine and to defend the research programs and strategies objectively and conscientiously. This does not mean autonomy without responsibility. The legal status is an important way of contributing to the autonomy of an institute, but legal status alone is not all. One can have a legal document and still no real autonomy.

**Ghazi Harlri** (ISNAR) — Agricultural research is part of the public sector. When we talk about a program and its implementation, resources should be made available as well as the possibilities to use them. This is the problem developing countries are facing. For instance, ADB is financing a project. If the funds only come from the government, there will be no incentive or very little incentive.

**F. M. Shao** (Tanzania) — I think that an important caveat needs to be raised with respect to autonomy. Autonomy should not be equated with isolation from the clients of research. I feel the problem is one of linking research to the transfer of technology. More particularly, how can we ensure that there is a link with farmers, especially small farmers?

**Carlos Valverde** (ISNAR) — The institute can develop a link between research and extension over the years. An example is Chile where at the beginning the links were very strong and later on they changed according to the situation. A change can also take place because of the fact that the transfer of technology does not take place as ISNAR would like it to take place. Very often, institutes are carrying out research without think-

ing about the transfer of technology. Institutes should also include the transfer of technology via the UTT (units of technology transfer).

**Emilio Madrid** (Chile) — What kinds of linkages are there between the institutes? In my case, at the level of the farmers, they go to special units where they receive training by INIA. INIA also has demonstration centers, and open days are organized at the stations.

**Carlos Valverde** (ISNAR) — Are there other cases like INIA? For instance, Ecuador had a problem in getting funds from the government, so the researchers took action like INIA and got feedback from farmers about their needs. At the same time, they started extension.

**Matt Dagg** (ISNAR) — In Africa, the situation is totally different. There is a need for linkages to be built in or outside the ministry, whether there is autonomy or not. In Ghana, for instance, there are good and bad linkages, but linkages have been built.

**F. M. Shao** (Tanzania) — There is a gap between research and extension people. When a parastatal unit is set up, this gap increases.

**Ajibola Taylor** (ISNAR) — Matt Dagg has clearly shown us that it is not because there is a research and extension department that there is a link. The goal is research. The institute should provide a system where there is a link between research and extension. There should be a *person within the research department in charge of extension services*. One should identify the centers within the system which would deal with the liaison duties *in the field* at the level of the regional unit. Regional units should be given the task of training (time + monitoring). Research needs to do far more for this than it is currently doing.

**Y. D. A. Senanayake** (ISNAR) — One has to establish a link and help it to be developed properly. Then I would also like to stress the fact that there should be a two-way flow of feedback — apex to farmers — to ensure that research has been relevant and has had an impact.

**J. K. Mukiibi** (Uganda) — I think there is quite clearly a problem of linkages. But according to me, one has to make sure that the technology is accepted by the farmers. I also believe there are different kinds of farmers (receptive and nonreceptive).

**Emilio Madrid** (Chile) — We have to prove to the farmers that the application of technology will have concrete results (such as doubling the price of a commodity).

**Celestin Belem** (Burkina Faso) — I think everybody agrees that there are different ways of having a link between extension and research: (1) training of researchers to provide extension services, (2) translation of the results of research by simple technical pro forma guidelines, and (3) meetings at the regional level between researchers and extension providers. The question one should ask is whether it is possible to do this formally or not.

**Ajibola Taylor** (ISNAR) — Resources should be made available for this link, so that this link may be formalized. Informal ways are also important but it is necessary not to leave this to the whims of researchers.

**Guy Rocheteau** (ISNAR) — In our discussions, we have raised several points. First, that there can be different types of autonomy (financial, administrative, and programatic). Second, that autonomy can occur at various levels within a system. Autonomy at the higher level may ensure a more rational administration but runs the risk of distancing research from its clients. Autonomy at the lower level has the advantage of being close to the farmer and linked to extension; however, it is much more difficult to manage. I think that we may conclude that while autonomy has many benefits, it is always relative and carries with it the responsibility of remaining closely linked to national development policy as well as the needs and problems of the agricultural sector and producers.

We have identified several mechanisms by looking at a wide range of situations where the question of autonomy has been addressed. This exchange of ideas will allow us to find the best solution to the particular problems and prospects that institutional autonomy offers to our NARS.

# Regional Research and Development Consortia: Decentralizing Research management in the Philippines

**Dely Gapasin**
*ISNAR Senior Research Officer*

## Introduction

Most of the large agricultural research systems in Asia are highly centralized, hence the need for increasingly complex mechanisms to carry out planning, monitoring and evaluation, coordination, and other management activities. However, the trend today is to decentralize research and establish the structure to implement it in order to make it more efficient and effective.

*Decentralization* is defined as dispersion or distribution of functions and powers from a central authority to regional and local authorities. Decentralization is achieved in the Philippine agricultural research and development (R&D) system through the establishment of regional R&D consortia to make research more responsive to the needs of various clientele groups.

The Philippine national agricultural research system (NARS) is a widely dispersed and very complex system with research institutions located in five government departments, four parastatals, public and private agricultural colleges and universities, private research centers, and specialized agencies. All these institutions are coordinated at the national level by an apex body, the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) under the Department of Science and Technology.

The R&D consortia are informal networks of research institutions bound together by a memorandum of agreement signed by all member-agencies, indicating the intent to collaborate and share research resources. The first consortium was established by PCARRD in 1975, and in 1988 a full complement of 14 consortia became operational.

## What Is a Consortium?

In the Philippine context, an R&D consortium is a mechanism or strategy for a network of institutions to manage, coordinate, and implement research. The premise of this strategy is twofold: (1) no single research institution can cope with all demands for technology and new knowledge, and (2) research is more efficient if resources (manpower, facilities, equipment, funds) and information are shared by the institutions involved in R&D.

The consortium is a venue for joint setting of priorities, planning of the regional program, monitoring and evaluation of projects, and enhancing technology transfer and training. Therefore, the strengths and limitations of the regional research institutions tend to be complementary, and in this way, their shared strength is harnessed to support R&D at the operational level.

Some of the objectives of decentralizing research management in the Philippines include the desire to make research management more participative and give more autonomy to the regional agencies to manage their own programs; to focus the R&D program on regional needs and priorities; to lessen centralized control on the allocation of limited resources; to increase collaboration among R&D institutions; to harness political support for R&D at the regional level; and to strengthen the linkages between R&D agencies to facilitate the transfer of technology to end users.

## The Fourteen Regional Consortia

Until 1986, when the Philippine government reorganized its structure and decided to decentralize, the consortia represented agroecological zones within the country. With a decentralized government system emerging, new consortia were established to conform to political regions, since planning for agricultural development, allocation of government resources, strengthening of extension, and other activities that have direct bearing on agricultural research were also being decentralized. There are now 14 such consortia distributed throughout the country.

In the past 15 years, three consortium models have emerged. Each has been modified to incorporate the requirements of the

different regions. The original model is a center-oriented consortium with the member-agencies occupying adjacent areas in an island. It is operated as an integrated center with facilities and other resources shared by all members.

The most common model is the consortium with a lead agency. It is based on a strong national or regional R&D center in a given region. The lead agency provides a secretariat, office facilities, and some staff, with the member-agencies jointly implementing an integrated program. The third model, the program-oriented consortium, functions in areas where the institutions are scattered among neighboring islands. The force that binds them together is a strong, well-coordinated R&D program.

## Structure of a Consortium

Regardless of the model, all the consortia in the Philippines have a common basic structure, which includes

- Regional coordinating body — this may be a committee, council, or board that sets policies for the consortium. It is composed of the heads of member-agencies.
- Technical support groups:
  - Regional technical working group — it reviews the regional R&D program and budget and is composed of research directors of member-agencies.
  - Regional commodity teams — they review and evaluate specific aspects of the program (commodities or disciplines) and are composed of regional scientists, extensionists, and users.
- Secretariat — carries out the day-to-day operations of the consortium. It is composed of full-time staff provided jointly by the base agency and members. It is headed by a consortium coordinator who is assisted by unit coordinators.

These components have evolved over time and are implemented in various ways, based on the needs of the specific consortium. They reflect the management mechanisms of the institutions and emphasize the needs of the joint program being implemented as well as the resources that are available to these institutions.

## Lessons Learned

Some of the lessons learned from the decentralized Philippine R&D consortia include the following:

- This system gives a better focus to regional needs and allows the national system to generate appropriate location-specific technology for users.
- Decentralizing government line agencies has provided a structure in which an informal system can work effectively.
- This system allows more active participation in managing the system at the operational level.
- It provides an effective mechanism for sharing research resources such as manpower, physical facilities, funds, etc., especially when they are limited.
- It strengthens linkages to users, the private sector, private volunteer organizations, nongovernment organizations, and local government, especially those involved in technology-transfer activities. This occurs because the system facilitates their direct involvement as consortia members and activities.
- The capacity and effectiveness of the consortia are variable. Success rests on strong leadership and the willingness of all institutions concerned to participate.

A more formal structure with legal authority and mandate may work better, but if the structure of the national system remains dispersed and unchanged, as in the case of the Philippines, this mechanism to decentralize research management can be a viable option. It continues to allow the Philippine NARS to be dynamic in responding to and accepting changes. It keeps research effective and efficient and brings the research system nearer to the users of technology.

# Summary Report to Plenary Session

**Matt Dagg**
*ISNAR Senior Research Officer*

The group did not attempt to deal with all of the large themes of organization and structure. It focused on only four aspects from the analytical framework discussed in the opening session:

- securing domain legitimacy and ensuring resource mobilization,
- influencing policy formulation,
- coordination,
- autonomy of research operations.

## Securing Domain Legitimacy and Ensuring Resource Mobilization

One major function of the NARS is to secure domain legitimacy and ensure resource mobilization: visibility and credibility with political leaders and clients must be maintained, with formal mechanisms if possible. Four main methodologies for doing this were considered: information exchange; coalition building; ensuring accountability of funds; and involving international partners.

### Information Exchange

Every effort should be made to publicize the work of the NARS and its component institutions. Several members of the group said this was their very first task as they found the research system was unknown. But this is not a onetime effort: it is a continuous, dynamic process, responding to changing circumstances, and it demands specific resources. An apex body, representing the entire NARS, is valuable both to improve visibility and to act as a focused voice for research.

### Coalition Building

It is necessary to build as broad a base of support as possible by establishing a network of allies in a range of ministries and user clients. Group members warned that even though agricultural research had often been moved into an autonomous organization to avoid ministerial bureaucracy, it was vital to maintain close ties with the agricultural development ministry. It was also important to secure consensus support from "science and technology" as well as from agriculture as the joint basis for agricultural research policy. Again, the board of an apex body was considered to be a valuable structure for building and maintaining a coalition for support.

### Ensuring Accountability for Funds

If governments are going to provide funds for agricultural research, they will require reassurances that the funds are being used effectively. Regrettably, research is long-term, and any impact it may have on production follows many years after the research is done. It is difficult to demonstrate its value on a short-term basis. A logical program-budgeting system helps. Praise by clients, rather than by researchers, is most valuable.

Users of research should be involved in the research planning process. This may require some decentralization of planning as it is difficult to bring farmer users into central bodies. Again, an apex body can bring together accounts of beneficial impact, and it can also establish reliable budgetary procedures throughout the system. This can reassure both internal and external donors, besides being a convenient body for external donors to deal with, rather than having to deal with several ministries.

### Involving International Partners

Research funding often depends heavily on international donors. Members of the group maintained that donors should not participate in the primary policy and planning exercises for national research. However, they are critical players for national research planners to consider. Once a national policy is defined, donors should be called in to provide feedback. Where donor objectives and national policy do not coincide, compromises may need to be made. An apex body, based on a well-defined national policy and set of priorities for national agricultural research, can be a useful structure for negotiations with donors.

## Influence on Policy Formulation

National agricultural research policy is the logical and desirable starting point for the development of a national agricultural research plan. The organization and structure of the NARS can have considerable bearing on the determination of this policy.

The group started from a model of policy based on factual information, which was assessed by beliefs and values in relation to goals. Clearly, the organization and structure of the research system must try to bring in a variety of stakeholders with different viewpoints and values, as well as a comprehensive dossier of relevant information.

In the past, planning departments have often tried to establish broad national policies by themselves. Recently there has been a move in some countries toward sectoral planning, and national agricultural research policy has been delegated to other bodies. An apex body for agricultural research should have such a mandate for setting research policy. It should also have an authoritative membership that represents the range of stakeholders. Rarely does one ministry alone have the comprehensive mandate for policy setting, and even if all research is within one department, there is a need for a broader group than the ministry to derive research policy. In particular, policy on agricultural development as well as science and technology must be involved.

The pros and cons of the composition of a suitable apex body for policy were discussed within the group. The balance was in favor of a relatively small number of representative members, who had adequate authority and could reach firm decisions. In large bodies, with all interests represented members tended to defend individual interests rather than reaching balanced conclusions for the general good.

In addition to a balanced membership, the apex body needs information on scientific opportunities and constraints as well as socioeconomic and physical information. A suitably high-powered policy body must therefore have a technical secretariat that can assemble and present this information.

Linkages must be maintained between the members of the policy body and a wide range of groups. External donors may be especially relevant. Donors have frequently played an important role in the establishment of apex bodies, if only to give themselves a unified body to deal with. However, donors should not be involved directly in policy decisions, however much they may feature in subsequent planning.

Policy bodies should make sure that their presence is felt by having a strong influence on decisions on allocations of resources to major research areas or research institutions.

## Coordination

The need for coordination of research activities is a problem in both developed and developing countries. We used the following definition: "Coordination attempts to bring all research efforts into a contextual purview with clearly defined purposes and objectives, and where efforts effectively complement one another in achieving these objectives."

Many countries have bodies or organizations charged with the coordination of agricultural research. However, a legal mandate to coordinate research is not enough; a consensus is necessary. Effective coordination really requires a willingness to share resources and goals in order to achieve a better use of resources. Political will is therefore vitally important for coordination, and all participants should benefit from the time and effort they put into coordinating activities.

The need for coordination applies throughout the research system, at national, institutional, and implementation stages. We focused only on *inter*institutional aspects, not the equally important *intra*institutional part, and addressed four main issues: (1) institutional composition, (2) determination of mandate, (3) structures and mechanisms, and (4) coordination of donor inputs.

The targets for improved coordination should be more efficient use of resources and complementarity of effort. Coordination works well among multiple research institutions with a diverse range of foci, mandates, and administrative structures. Presentations showing the need for coordination among research, government policy, development, and knowledge systems revealed great complexity. Clearly not all desirable coordination mechanisms can be put in place in a finite organization. The extent and kind of coordination must depend on the scope of the research system. Choices among the most important mechanisms must be made — priorities must be set. An analysis of which coordination mechanisms are the most important would be valuable.

To facilitate coordination, the mandates of the different institutions must be reasonably well defined, and they must be well known in the system. There are several kinds of mandates possible — regional, commodity, thematic, etc. To avoid overlapping confusion, the range of jurisdictions among the coordination mechanisms must be defined, just as the range of institutional jurisdictions must be.

The general mechanisms suggested covered the following:

- communication — mutual adjustment;
- administrative supervision;
- joint programs between institutions;
- thematic coordination;

- commodity coordination;
- nationally coordinated research programs, fully financed.

Other desirable features included

- an efficient flow and exchange of information between institutions;
- the ability of institutions to make decisions in relation to the activities of other research groups;
- coordination linked to the process of resource allocation.

It was noted that an apex body that has the mandate to coordinate agricultural research nationally (and internationally) should have a strong influence (if not direct power) on the allocation of resources to institutions.

## Autonomy or Decentralization of Research from Bureaucratic Ministry

Many research systems have attempted to achieve some independence from parent ministries of agriculture. Research often suffers at times of crisis in a development-oriented ministry, and the bureaucratic procedures and environment that are appropriate for production and development are not appropriate for research.

Outstanding examples are to be found in Latin America, and we began with an overview of the Latin American experience where there are many autonomous and semiautonomous research institutes with full legal status. INEA of Chile was used as an example. This was followed by an Asian example from the Philippines, where research management has been decentralized among regional consortia of research institutes. We then considered the cases of Zimbabwe, where the Department of Research and Special Services is reasonably free of ministry bureaucracy but has no legal autonomy, and Kenya, where the Kenya Agricultural Research Institute has been established with full legal status, but it has taken a long time to bring it into practice.

Points arising from the discussion included the following:

- No research institution is completely autonomous, nor should it be. The national agricultural research system is, and must be seen to be, part of the public service and accountable to the government and its clients. The very autonomous INEA in Chile insisted on having a strong governing board with the minister of agriculture as chairman. It did this to maintain close contact with the ministry, and the initiative came from INEA.
- The target should be autonomy of operation and of the means of carrying out research. But many ministries, agencies, etc., are concerned with research output; therefore, they must have some influence on the determination of the research program. The Department of Research and Special Services in Zimbabwe has been given full autonomy of operation by the ministry of agriculture. This could be done because there is a controlling check on the research program by an independent agricultural research council that has user client membership and that advises the parent ministry.

  Dr. Valverde proposed a rule that

  Trust x Control = a Constant

  There must be trust for institutions to have autonomy.

- The more operationally autonomous an institute is, the more responsibility it must assume for maintaining program contact and linkages with other agencies. This also applies to the communication of research conclusions to clients, especially extension and farmers. In practice, autonomous institutes often provide a better vehicle for interaction with clients than ministerial bodies.

  To be avoided at all costs is the reverse situation where the research operations of an institution are fully under the bureaucratic control of a ministry, but where it is essentially autonomous in its choice of research program, with no outside influence from clients.

- There is in fact a range of ways of achieving and expressing autonomy, each with varying degrees of legal authority. Autonomy is a means of giving flexibility to the operation of a NARS, within the national requirements of the NARS, but it does *not* mean independence from national development objectives.

## Apex Bodies

The value of apex bodies emerged during the discussions. The apex body may have been established mainly for the following reasons:

- integration: to provide a national point of integration when research was dispersed over several ministries and agencies;
- autonomy: to provide more flexibility of operations for research.

But there are several additional major benefits from an apex body:

- It serves as a policy body. Even if research is contained within one department of one ministry, the body that determines national research policy must have broader representation.

- It provides a central body to negotiate with donors from the basis of a national research policy and plan.

- It provides a unified voice for research and higher visibility in attracting resources.

- It is a powerful means of building a coalition of allies to support research. This is particularly important with respect to generating a consensus of support from ministries or agencies of science and technology as well as from those dealing solely with agriculture.

- It is a powerful and formal base for coordinating research activities, for expressing political will, and as a source of resources to distribute as incentives for coordination.

# The Viewpoints of NARS Leaders on Organization and Structure: Thematic Group Sessions

**Y. D. A. Senanayake**
*Consultant to ISNAR on the Organization and Structure of NARS in Asia*

The participants agreed that there are four issues that are extremely relevant to the organization and structure of a NARS. These four issues are

1. research policy;
2. domain legitimacy;
3. coordination;
4. autonomy.

They also felt that these issues were important to other developing-country NARS as well. They agreed that ISNAR could make the greatest contribution by developing an information base and advisory capacity to assist the NARS in resolving these issues.

Based on the presentations, the regional perspectives, and the discussions, the workshop participants identified the areas that ISNAR would have to address in the future. These areas are discussed in detail below.

## Apex Bodies

There are a number of different kinds of apex bodies, and each kind has had a different approach to dealing with the four issues discussed in this workshop. There are strengths and weaknesses in all four areas.

For countries planning on establishing an apex body in the future, ISNAR's experience in the creation and functioning of apex structures and the approaches to improving the four issues listed above would be extremely important. The lessons learned by ISNAR through its interactions with developing-country NARS could be invaluable for creating a mandate for new apex bodies as well as contributing to the functioning of existing bodies.

## Research

In research on agricultural research management, NARS leaders feel that two areas need further attention: namely, methodologies and the identification of constraints in key aspects of research organization and management. The focus should be on the refinement of methodologies with an eye to developing more effective and efficient management of agricultural research. Likewise, ISNAR could examine the transferability of methodologies between NARS, within regions as well as between regions. The applicability of methodologies to NARS in different stages of evolution, as well as size, would also help address the four issues listed above.

The consensus was to identify constraints that have contributed to the ineffectiveness of the four issues in NARS with apex bodies. The aim of this research should be the resolution of constraints in existing systems. ISNAR's experience could then complement its advisory role in restructuring or creating apex bodies in the future.

## Management

Improvements in several areas of the organization and structure of research management are necessary to strengthen the four issues:

- **Policy** — Different types of apex bodies have existed for some time, but there is one deficiency that can be found in all of them, as well as in the ministry model. This is the absence of an effective policy-forming unit. A unit of this sort is invaluable to the development of national policy goals and an agricultural development plan. Its role in developing and fostering "science statesmanship" among the administrative and political hierarchy should be stressed.
- **Strategic Planning** — The importance of strategic planning was introduced during the first plenary session. However, the weaknesses that exist in strategic planning

need to be addressed by ISNAR in the future, in cooperation with the NARS.

- **Networking and Linkages** — The NARS leaders feel that developing intra- and interregional networks would be productive. ISNAR's regional and international experience in improving developing-country NARS could also help in networking. Networking would enable regional research leaders to be in contact more frequently and would be very helpful in resolving issues.

  Closely related to networking is the development of effective linkages. ISNAR's international workshops are effective at fostering intra- and interregional linkages. ISNAR's credibility among developing-country NARS leaders as well as among international agencies is an asset which can help continue the process of developing linkages.

- **Funding** — Organizing for funding is a critical issue that has direct bearing on the effectiveness of a NARS. Without funds, the researchers downstream, at institutional and implementational levels, can do little. Improvements in establishing domain legitimacy and formulating clear policy guidelines could assist the funding process.

- **Institutional Autonomy** — Program and administrative autonomy must permeate all levels of organization and structure in a NARS. It has an influence on all four issues, and improvements in any one area also have an effect on institutional autonomy. Here again, the development of "science statesmanship" among NARS leaders is indispensable. It is also indispensable among the policy-making administrative hierarchy and policy-approving political hierarchy.

- **Decentralization** — Consolidation has usually been the goal in the NARS reorganization, but now larger NARS are beginning to decentralize research management. The organization and structure of decentralized systems is another area that needs attention. From the lessons learned from NARS with centralized apex organizations, ISNAR should now identify the organization and structure most appropriate to decentralized systems. Even in decentralized systems, NARS managers will have to confront the four issues listed above.

- **Training in Agricultural Research Management** — In the past, ISNAR has provided training both at its headquarters and in the regions, and this training has helped improve research management in developing-country NARS. This activity should be continued for the following three reasons: since agricultural research management has become a dynamic new discipline for developing countries and because the NARS continue to generate new research managers from among their scientists, a continuity of training is essential to develop new NARS leaders. Second, countries that have had more closed political systems are beginning to open up. This group of countries will also require training as they begin to restructure their systems. Third, many small countries, where the NARS are small and research managers are few, will also need training to provide the management capability they require.