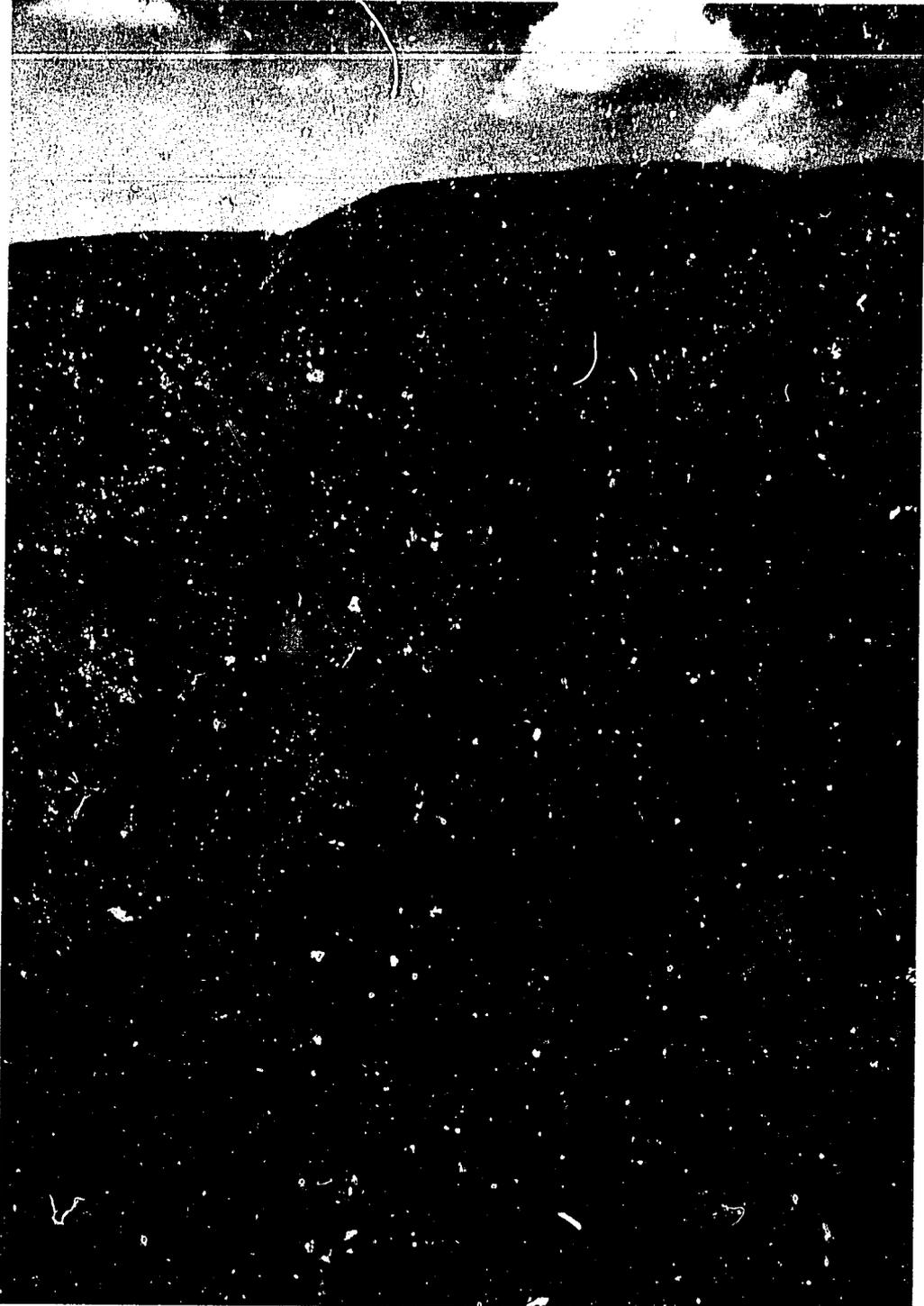


# 1991 Annual Report

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Theme: Strategic Planning



**ISNAR**

The mandate of the International Service for National Agricultural Research (ISNAR) is to assist developing countries in bringing about lasting improvements in the performance of their national agricultural research systems and organizations. It does this by promoting appropriate agricultural research policies, sustainable research institutions, and improved research management. ISNAR's services to national research are ultimately intended to benefit producers and consumers in developing countries and to safeguard the natural environment for future generations.

ISNAR offers developing countries three types of service, supported by research and training:

- For a limited number of countries, ISNAR establishes long-term, comprehensive partnerships to support the development of sustainable national agricultural research systems and institutions.
- For a wider range of countries, ISNAR gives support for strengthening specific policy and management components within the research system or constituent entities.
- For all developing countries, as well as the international development community and other interested parties, ISNAR disseminates knowledge and information about national agricultural research.

ISNAR was established in 1979 by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force. It began operating at its headquarters in The Hague, The Netherlands, on September 1, 1980.

ISNAR is a nonprofit autonomous institute, international in character, and apolitical in its management, staffing, and operations. It is financially supported by a number of the members of the CGIAR, an informal group of donors that includes countries, development banks, international organizations, and foundations. Of the 18 centers in the CGIAR system of international centers, ISNAR is the only one that focuses specifically on institutional development within national agricultural research systems.

*COVER PHOTO: A quiltwork of intensively cultivated fields covers a hilly region of southwestern Uganda. The country's small farmers have only one to three hectares of land on average, and most cropping is mixed. The new national plan to rehabilitate agricultural research (see page 16) focuses primarily on the needs of small-scale farmers.*

# 1991 Annual Report

July 1992



**International Service for National Agricultural Research**

### **Citation**

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### **AGROVOC Descriptors**

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management; research institutions; research; agriculture

### **CABI Descriptors**

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agricultural research; management; research institutes

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## Preface

**D**uring 1991, the staff and management of ISNAR took careful stock of what we have accomplished over the past five years. We also began to chart a new course that will direct our work during the remainder of the decade.

It was a year of reflection, planning, and transition. We did of course actively continue our traditional work of advising and supporting the national agricultural research systems — the NARS — on matters of research policy, organization, and management. But, in what might be described as a reversal of roles, ISNAR also sought, and carefully listened to, the counsel of many other partners and colleagues regarding the ways we plan, organize, and deliver our service.

To begin with, a major External Review of ISNAR's program and management was conducted in June and July 1991 by an international panel appointed by the Technical Advisory Committee (TAC) of the CGIAR. It was an important evaluation exercise — a kind of institutional rite of passage that every member of the CG family of international centers must go through every five years or so.

The results of the review were unequivocal. In its comments, the TAC noted: "In the view of the Panel, ISNAR emerges from the Review as a strong and credible organization with a big task ahead of it." Highlights of the review panel's recommendations, and a brief discussion of ISNAR's assessment of its work over the past five years, can be found beginning on page 57.

In step with preparations for the External Review, ISNAR's Board took a decision in March 1991 to revise our institutional strategy to ensure its relevance for the coming decade. The work was assigned to an internal task force of nine

staff members supported by an advisory committee. Their draft strategy was based on numerous sources of information and advice. These included a consultation with an international panel of eminent agricultural experts, surveys of NARS leaders, the recommendations of the External Review, and intensive discussions with ISNAR staff. It is worth noting that the External Review team provided valuable feedback on the revised strategy and its views were incorporated into the final document.

The consultation with the international panel of experts, a three-day meeting in May 1991, was something of an exercise in crystal-ball gazing. Its purpose was to look ahead 20 years or so in an attempt to identify the problems and challenges likely to confront agriculture, agricultural research, and, by extension, ISNAR's service to NARS. This vision of the future helped to guide ISNAR in revising its strategy. A brief description of this expert consultation can be found on page 48.

The first draft of the ISNAR strategy was submitted to the Board in September for a preliminary assessment. Comments from trustees, staff, and NARS leaders provided the basis for another round of revisions toward the end of the year. In this respect, an important contribution was the deliberations of NARS leaders from nine Asian countries who met with ISNAR and several donor representatives in Bangkok in October (see page 49).

The final draft of the ISNAR strategy was reviewed and approved by the Board in April 1992 and the revised document distributed to CGIAR donors and centers in May. The strategy and plans for its implementation will be highlighted in next year's annual report.

On the program side, ISNAR was heavily involved in strategic planning exercises for research in Uganda, Mali, and, as a direct follow-up to a diagnostic review earlier in the year, in Bhutan. Our activities in these three countries are highlighted in the section titled Advisory Service. We also examine our assistance in introducing INFORM, an ISNAR-developed management information system, to several national research systems. Advisory work in other countries is briefly noted at the end of the section.

Among the NARS there is an insatiable demand for improved approaches to, and practical tools for, agricultural research management. At the same time, a wider audience that includes university researchers and development agencies is in need of up-to-date information on the state of national agricultural research around the world. Beginning on page 31 we highlight progress in four areas of ISNAR research: monitoring and evaluation of research; issues in biotechnology; China's national research system; and the planning, design, and maintenance of research buildings.

Also worthy of note was the publication in 1991 of a major work of research and analysis titled *Agricultural Research Policy: International Quantitative Perspectives*, published for ISNAR by Cambridge University Press. Among other things, this volume interprets financial and human resource data on more than 150 NARS, spanning two and a half decades beginning in the 1960s. The information

was collected and analyzed by ISNAR over a six-year period. It has already proven useful to policymakers and analysts engaged in planning or advising on agricultural research issues. The shaded text beginning on page 42 highlights some of the major issues discussed in this important new volume.

ISNAR's management training program, like its research program, is an integral part of our support to the national systems. Major components of our current program are a joint project with the Kenya Agricultural Research Institute and a regional project for southern African countries, operated in partnership with the Southern African Development Coordination Conference. Highlights of 1991 activities of these two projects, as well as other events, are presented beginning on page 45.

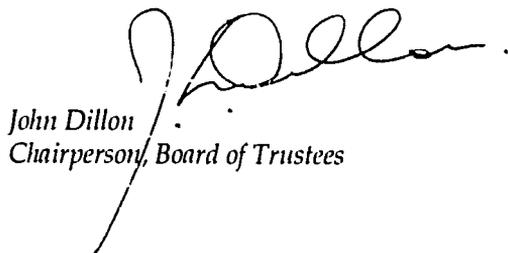
It was indeed a busy and fruitful year for ISNAR. The remainder of the decade promises to be a challenging period in which fiscal contraction and swelling demand for technology will force national research systems to become more efficient and effective. With the External Review now behind us and our revised strategy ready for implementation, ISNAR is in good shape to serve the evolving needs of the national agricultural research systems of developing countries.

On behalf of the staff and Board of Trustees of ISNAR, we take pleasure in presenting the institute's Annual Report for 1991.



Christian Eonte-Friedheim  
Director General

July 1992



John Dillon  
Chairperson, Board of Trustees

## ISNAR Board of Trustees — 1991

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Affairs, The  
Netherlands

\*\* Joined the Board in 1991  
\* Completed service in 1991

*Seated, left to right: Camus, Rakotoavao, Dillon, Merrill-Sands (secretary), Hemmi. Standing: bin Hashim, Junguito, Wessels, Al-Shayji, Bonte-Friedheim, Senécal, Porceddu, Peters, Berndt Müller-Haye (FAO observer).*



## Selected acronyms used in this report

<b>AGCD</b>	Administration Générale de la Coopération au Développement — Belgium
<b>AARD</b>	Agency for Agricultural Research and Development — Indonesia
<b>ACIAR</b>	Australian Centre for International Agricultural Research
<b>AgGDP</b>	agricultural gross domestic product
<b>BMZ</b>	Bundesministerium für Wirtschaftliche Zusammenarbeit — Germany
<b>BIOTASK</b>	CGIAR Biotechnology Task Force
<b>CABI</b>	CAB International
<b>CARP</b>	Center for Agricultural Research Planning — Indonesia
<b>CARP</b>	Council for Agricultural Research Policy — Sri Lanka
<b>CAAS</b>	Chinese Academy of Agricultural Sciences
<b>CASER</b>	Center for Agro-Socioeconomic Research — Indonesia
<b>CGIAR</b>	Consultative Group on International Agricultural Research
<b>CIFAP</b>	Center for International Food and Agricultural Policy, University of Minnesota — USA
<b>CTA</b>	Technical Centre for Agricultural and Rural Cooperation — ACP-EEC Lomé Convention
<b>DANIDA</b>	Danish International Development Agency
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FUNDAGRO</b>	Fundación para el Desarrollo Agropecuario — Ecuador
<b>ICAR</b>	Indian Council of Agricultural Research
<b>IBTA</b>	Instituto Boliviano de Tecnología Agropecuaria — Bolivia
<b>IDB</b>	Inter-American Development Bank
<b>IDRC</b>	International Development Research Centre — Canada
<b>IER</b>	Institut d'Economie Rurale — Mali
<b>IICA</b>	Inter-American Institute for Cooperation on Agriculture
<b>INFORM</b>	Information for Agricultural Research Managers
<b>INIA</b>	Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria — Spain
<b>INIAP</b>	Instituto Nacional de Investigación Agropecuaria — Ecuador
<b>INRAN</b>	Institut National de Recherches Agronomiques du Niger
<b>INSAH</b>	Institut du Sahel
<b>ISRA</b>	Institut Sénégalais de Recherches Agricoles
<b>KARI</b>	Kenya Agricultural Research Institute
<b>NAARM</b>	National Academy of Agricultural Research Management — India
<b>NARO</b>	National Agricultural Research Organization — Uganda

<b>NARS</b>	national agricultural research system
<b>PCARRD</b>	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
<b>RNR</b>	renewable natural resource(s)
<b>SEARCA</b>	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
<b>SPAAR</b>	Special Program for African Agricultural Research
<b>TAC</b>	Technical Advisory Committee of the CGIAR
<b>USAID</b>	United States Agency for International Development

## Critical factors in strengthening NARS

### ■ In agricultural research policy

- Creating and maintaining positive interactions between agricultural research and national development policy.
- Formulating effective agricultural research policies: setting priorities, allocating resources, and developing long-range plans.

### ■ In research structure and organization

- Building an effective NARS structure and organization.
- Developing linkages between the NARS and policymakers.
- Creating linkages between the NARS, the technology transfer system, and users of technology.
- Developing and using linkages between the NARS and outside sources of knowledge.

### ■ In agricultural research management

- Formulating programs and program budgeting.
- Monitoring and evaluating research programs.
- Managing information.
- Developing and managing human resources.
- Developing and utilizing physical resources.
- Acquiring and managing financial resources.

## I. Advisory Service

*The heart of ISNAR's service to developing countries is the advice and assistance the institute gives to national agricultural research systems (NARS) in the areas of research policy, organization, and management. In 1991, the institute's Advisory Service program accounted for 33% of core program expenses.*

*The approach traditionally followed by the Advisory Service is, for the most part, sequential.*

*First, constraints on the agricultural research system of a client country are diagnosed, and strengths and opportunities are identified. This exercise takes the form of a mission to the requesting country, usually two to three weeks long. The ISNAR review team, working in tandem with a national task force, familiarizes itself with the country's agricultural sector, national development objectives, agricultural research policies, the NARS, its managers, and their research programs. A detailed report with recommendations is submitted to the government for its consideration. The report often presents various options for development, depending on the resources the government is willing and able to commit and on how quickly it is prepared to move. In 1991, ISNAR reviewed the NARS of two countries, Bhutan and Hungary.*

*The diagnostic mission sets the stage for the next step: strategic planning. ISNAR staff, consultants, and national working groups together design the measures needed at various levels of the national research system. These range from system-level structural changes such as the establishment of a national coordinating body, right through to changes in the orientation and content of actual research programs and projects. ISNAR's work in Mali is a typical example.*

*The third step is to assist the NARS with the implementation of the planned changes. This may take the form of consultations with ISNAR staff, workshops to familiarize all the major players in the research system with the planned changes and to build consensus, or training of managers. Occasionally, ISNAR posts a staff member to the client country to assist with implementation, as in the case of Uganda, described below.*

*In response to growing demand in recent years, ISNAR has increased its assistance with strategic planning and with improvements in specific "critical factors" or components (see list on page 9) of research policy, organization, and management. As NARS become more developed, an increasing number are confronting what might be termed second-generation problems related to these specific components. In some instances, a second diagnostic review might be required. A major lesson learned is that ISNAR must foster the growth of an extended family of associates and long-term consultants who can be called on to provide support for some of our major planning activities.*

*In light of this trend, we focus this year on advisory work in two areas: long-term planning and management information systems.*

*In three brief essays we examine the process of strategic planning in Mali, Uganda, and Bhutan. In a fourth, we record some of our work in assisting eight countries to organize their management information using an ISNAR-developed tool called INFORM.*

*The final pages of this section give a brief roundup of our advisory activities in other countries and with other organizations.*

*During the year, ISNAR staff also made major efforts to analyze our country-collaboration activities over the past five years. This series of self-evaluations prepared the institute for the External Review which took place in June and July. Perhaps more important, they also helped ISNAR to come to grips with the task of assessing the impact of a service organization dedicated to institutional development. How does one measure the effects of such work? And how can the effects of ISNAR's efforts be separated from those of the numerous other factors and actors influencing the performance of a dynamic national research system? Assessing the impact of the activities of an institute such as ISNAR is indeed difficult.*

*We took the stand that our product is improved institutional tools and management technologies and that our work must be assessed in terms of improved management and performance of the NARS that use them. To try to measure ISNAR's impact by looking at improvements in agricultural production in developing countries would be a flawed approach. The evaluation exercises helped us to compile a list of indicators of improved organization and performance of NARS. Against these indicators, senior ISNAR staff were asked in a ques-*

*tionnaire to evaluate the national systems with which they have worked over the years. Highlights of their assessments are presented beginning on page 57.*

## Mali

**M**ali is one of several African countries with which ISNAR has collaborated intensively in recent years in a full reorganization of agricultural research according to a strategic plan.

Our assistance with planning during 1991 focused on the joint drafting of four different "scenarios" for research-system development. These options range from a small portfolio of high-priority research activities requiring a modest expenditure of resources, to a large number of activities (high, medium, and low priority) requiring a much higher level of resources. The scenarios were presented to Malian national research leaders and policy-makers for their consideration.

In recent years, these senior scientists and officials have been concerned with strengthening their research system so that it can fully address serious challenges to agriculture — among them, desertification, soil fragility, and intense pressure from human and animal populations on the natural resource base. Two major interrelated problems stand out: dependence of the research system on donor funding and dispersion of its research efforts. It is the second problem that ISNAR has been primarily concerned with in providing assistance.

The government's financial support to research has traditionally been largely

consumed by the salaries of a research staff too big for the available resources: some 200 scientists, plus technicians and other support personnel. As a result, there has been little government money available to cover operating costs of a research effort that spans some 35 agricultural commodities, themes, and production systems. This has led in many instances to unproductive research.

The reliance on donors to cover some of the necessary operating costs has exacerbated the problem. In effect, the execution of donor-funded projects in piecemeal fashion has not amounted to a coherent program that fully addresses the needs of farmers and other clients.

ISNAR's partnership with the Malian national research system began in 1988 with a diagnostic review. This was followed up in 1989 with an assessment of research needs, and then in early 1990 with advice on merging the country's two main agricultural research institutes into one organization. In October of that year the government passed a law creating the Institut d'Economie Rurale (IER). This is a semi-autonomous organization responsible for research on crops, livestock, and forestry, and forms the core of the NARS.

The next major step in institutional development was to draft a strategic plan for research. Formulating the 12-year plan was a major project, carried out in 1990

and 1991 by several Malian working groups with the assistance of a four-member team from ISNAR.

The planning work can be divided into four major tasks:

- sketching out the various *domains* of agricultural development that IER needs to focus on — in other words, defining the scope of the overall national research system;
- designing a portfolio of research *programs*, identifying their constituent *projects*, and setting timetables; estimating the *resources* (people, money, and facilities) that will be needed to conduct the programs and comparing these with available resources; and setting *priorities* among the projects within each program;
- designing an *organizational structure* and *management mechanisms* for IER to carry out the research programs;

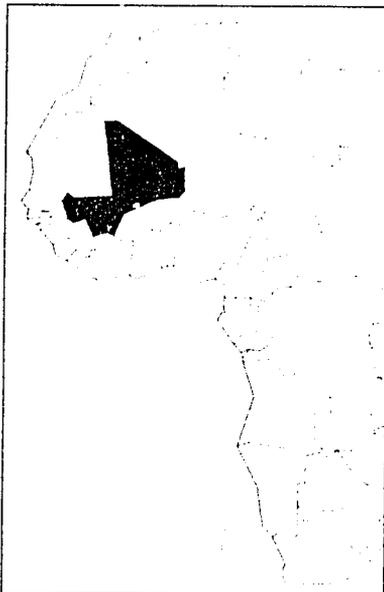
- formulating various *scenarios* for the development of IER and estimating the resource implications of each.

### *Domains of research*

The first task was to step back and look at the agricultural research needs of the country as a whole. In 1990, a group of 44 researchers and ISNAR staff got together for three days in Bamako. They redefined the national mandate of the soon-to-be-established umbrella institute, IER, and sketched out nine broad “domains” of research for agricultural development. These domains were in fact the first cut in the complex process of defining a portfolio of research.

### *Program planning*

This exercise was carried out in 1990 and early 1991 by nine Malian working groups supported by an ISNAR planning specialist. Some financial support for this



- **Mali** is a landlocked country of the West African Sahel, with a total land area of 1.24 million sq. km. It is bordered in the south by Côte d'Ivoire and Burkina Faso, in the east by Niger, to the north by the Algerian desert, and in the west by Mauritania, Senegal, and Guinea.
- 1988 **population** of 8.8 million; annual growth rate (1980-88) of 2.4%.
- **Main agroecological zones:** northern desert, the Sahel zone of subdesert, the central zone of dry savanna, and the southern zone of humid savanna.
- **Agriculture's contribution to economy:** about 49% of gross national product.
- **Principal crops:** millet, sorghum, cotton, rice, groundnuts, maize, mangoes.
- **Principal livestock:** cattle, sheep, goats.
- **Agricultural research:** 203 researchers (1990 figure) in the Institut d'Economie Rurale.

part of the planning work was provided by USAID.

Work on seven major commodities was carried out first; later, two more working groups were created to plan research on natural resource management and farming systems. From the original nine domains, seven programs eventually emerged: cereal crops and food legumes; industrial crops; horticultural and fruit-tree crops; livestock; forestry and fisheries; farming systems and rural economics; and natural resource management. This set resulted from an effort to organize various research activities in as practical a way as possible. For example, the planners wished to ensure that soil and water conservation studies that cut across various commodities could be put under one roof.

In designing each program, the working groups went through a detailed step-by-step planning process, developed and refined earlier by ISNAR staff in collaboration with research managers in several countries. We describe it here in a simplified way. It should be noted that the process needs to be adjusted to the needs of the particular country using it, and its application in Mali was no exception:

- The working groups reviewed national agricultural *development goals* and described existing production systems, analyzing their potential for achieving those goals.
- They analyzed the *constraints* on production and other agricultural goals and determined which ones might be solved by scientific research. In some cases, constraints are not "researchable" but are better dealt with through policy or other mechanisms such as pricing and production incentives.
- The working groups evaluated the results of *past research*, including scientific findings and technologies available from outside sources. If a technology to solve a constraint is already available, there may be no need for any further research to be carried out under the program plan. Or perhaps only adaptive research or testing is needed.
- The working groups identified research opportunities and set specific *research objectives* based on the researchable constraints they had identified.
- They identified clusters of scientific *activities* that needed to be carried out in order to meet each objective, i.e., overcome the constraint. Together, each cluster of activities constitutes a research *project* — a natural forum for scientists, usually from different disciplines, to interact in pursuit of a common goal.
- The human and financial *resources* needed for each potential project were then estimated. The main task here was to calculate how much time is needed by which type of scientist to carry out each of the activities in a project. Pre-established guidelines for operating funds and salaries for scientists and support staff were then used to calculate the annual funding requirements.
- The next step was to set *research priorities* among the projects in each program. Among the criteria for ranking the projects according to their priority were: the potential for increasing input productivity and agricultural production; the likely rate of technology adoption by farmers; the chances of the research succeeding; the environmental impact of the technology to be

developed; and the costs of the research expressed in research-years, as an indicator of total costs. In a nutshell, the setting of priorities enabled the planners to define a feasible and useful set of research projects for each program.

- The final step was "gap analysis", that is, comparing currently available human and other resources with the resources needed for the planned research programs. Among other things, this exercise tells the planners what recruitment (national and expatriate) and scientific training will be needed. It also suggests how many scientists will have to be relocated or reassigned.

### *Organization and management*

In parallel with the program planning, the IER-ISNAR team designed an organizational structure for IER to fit the strategic plan. This design includes guidelines for implementing the research projects.

Essentially, the proposed structure calls for IER to consist of six research centers which will act as the pillars of the national research system. Each will be located in a different agroecological zone and each will have its own research stations. For management purposes, the strategic plan assigns each program headquarters to a research center. As far as possible, programs are to be assigned to centers in agroecological zones where their target commodities or production systems are economically important. While the management of a program will be located in a specific center, the actual research projects will be decentralized to various locations around the country.

### *Four scenarios*

As mentioned above, ISNAR's planning work with Mali during 1991 centered mainly on drafting four research "scenarios". This work was carried out jointly by IER and ISNAR staff. The aim was to give policymakers options to consider, depending on what level of funding, both from government coffers and donors, they would be willing to commit.

Scenario A is the deluxe model, so to speak. It includes all projects formulated during the program-planning exercise, no matter what priority they were assigned. However, lower-priority projects would be carried out only during a second phase of the research plan (beginning in year seven).

Scenario B would leave the lowest-priority projects out of the 12-year research plan. Research requiring expertise not currently available in IER would be left to the second phase of the plan.

Scenario C is a more restrictive version of scenario B. It comprises only those projects of high and medium priority that are now in progress or to which IER is already committed.

Scenario D, the one recommended by ISNAR, might be called the "bare essentials" model. It includes only those research projects designated by the planners as first-level priorities and already in progress.

Along with each scenario the likely resource implications were presented. The annual operating costs (excluding salaries) of scenario A, for example, would be CFA 3.7 billion (about US\$13.7 million) and for scenario D, CFA 2.4 billion (about US\$8.9 million). Scenario A would require 196 qualified researchers; scenario D, 125 researchers.

The scenarios were presented at a seminar in September attended by more than 50 Malian agricultural research

leaders and policymakers. These included senior managers from IER, from the ministries of Agriculture and of Planning and Finance, and from development corporations, plus donor representatives and university scientists and administrators.

Scenario B, with modifications, was the option recommended by participants. This would maintain all ongoing activities and all researchers now on staff within IER. The modifications called for certain low-priority research projects (pertaining to the Gao region of Mali) to be included in the scenario.

To incorporate these changes, however, the planning team had to "optimize" the scenario. This was done, with the assistance of ISNAR staff, by a senior Malian research manager during a three-week visit to ISNAR headquarters in November 1991. The team recalculated the resource requirements and adjusted the scenario to make it consistent with the mix of funds likely to be available annually from the government and donors.

The revised scenario is now the basis for continued discussion between IER

and donors regarding the funding of the first six years (phase 1) of the new plan.

The planning exercise has provided IER with a well-conceived and logical blueprint for research over the next 12 years. It will enable Mali to better coordinate the funding and implementation of research, at the same time putting the government in a strong position vis-à-vis donors. In fact, the Special Program for African Agricultural Research (SPAAR) and the Institut du Sahel (INSAH) have selected Mali as a test case for application of a "consolidated financial mechanism" for cofunding of agricultural research in the Sahel. This is intended to provide better coordination among donors and better financial management by recipient countries.

ISNAR has also benefitted greatly from the planning exercise. Our collaboration with Mali has sharpened our ability to provide intensive, team-based support for institutional development. The experience should prove useful in our future partnerships with other countries.

## Uganda

The East African country of Uganda has begun to reorganize and rebuild its fragmented agricultural research system under a single umbrella organization that will focus research on a smaller number of priority commodities and subject areas than in the past. The move follows the completion in early 1991 of a major long-term planning exercise by a Ugandan working group assisted by ISNAR.

The rehabilitation and reorganization will take place over five years under the auspices of the Agricultural Research and

Extension Project. The World Bank is providing \$0.6 million for a first-phase "Headstar" project.

Over 90 percent of Uganda's 17 million people live in rural areas. Agriculture is by far the most important sector of the economy, contributing about two-thirds of the gross domestic product. Yet the country has been investing just 0.2% of its agricultural gross domestic product (AgGDP) on research in this sector, far below the average for comparable developing countries.

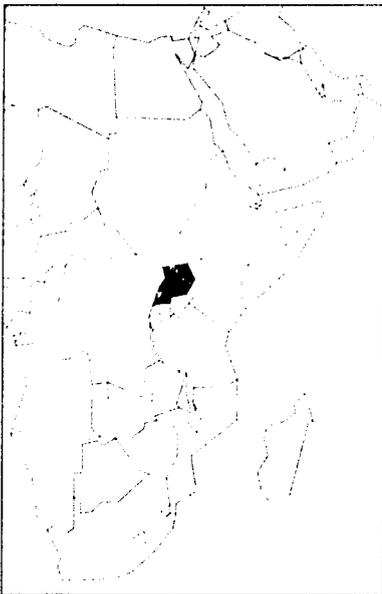
### *Looted labs and bare shelves*

ISNAR's work with the Ugandan research system dates from 1986, when the current national government came to power. The civil war and economic decline of the 1970s and early '80s had left Uganda's agricultural research system debilitated, as it did other spheres of national development. Research stations and equipment had been damaged, destroyed, or looted. Library shelves were bare of scientific papers and journals. There was little research activity going on. It was no wonder that morale among the 50 or so qualified researchers was very low. Nonetheless, the country continued to be agriculturally self-sufficient. And it was even exporting both industrial crops and food crops, thanks largely to a sound agricul-

tural structure in the most productive regions.

It was in this context that the Ugandan government invited in the UN Food and Agriculture Organization and ISNAR for an assessment of agricultural research. The question put to them was this: What can be done in the short term to revive research and encourage our demoralized scientists? The course decided on was to repair whatever equipment was still intact, replenish laboratory supplies and scientific documentation, and improve transportation for researchers. FAO provided most of the funds for the effort, with the government contributing funds for repairs. But at best this was a stop-gap measure.

ISNAR began a second phase of collaboration with Uganda the next year, in 1987. The government invited the World



- **Uganda** is a landlocked country of eastern Africa, with a total land area of 236,040 sq. km. It is bordered by Kenya, Rwanda, Sudan, Tanzania, and Zaire. The pleasant climate, rich soil, and abundance of water, forest, and fisheries resources of some areas earned Uganda the name of "Pearl of Africa".
- 1988 **population** of 17.2 million; annual growth rate of 3.4%.
- Four main **agroecological zones** ranging from the high-altitude semi-temperate zones to the west and east, to the southwestern tall grassland zone and the lake crescent; mainly **small farms** of 2.5 to 3.0 ha.
- Agriculture's **contribution to economy**: about 70% of GDP and 80% of export earnings.
- Principal food and industrial **crops**: banana, cassava, sweet potato, maize, coffee, tea, cotton, sorghum, finger millet.
- Principal **livestock**: cattle, sheep, goats, poultry, freshwater fish.
- Agricultural **research** organizations: the research departments/divisions of three ministries — Agriculture, Animal Industry and Fisheries, and Environment Protection -- will form the nucleus of the new National Agricultural Research Organization (NARO) under a unified Ministry of Agriculture. Other organizations conducting agricultural research: the Uganda Tea Authority, the Uganda Coffee Authority, Makerere University.

Bank, USAID, and ISNAR to review the agricultural sector. ISNAR staff worked with Ugandan counterparts to review the national research system and make recommendations.

### *Need for an umbrella organization*

The resulting review report, which called for the creation of an umbrella organization for agricultural research, became a reference point for later planning. The government agreed with the recommendation and in 1988, ISNAR, with USAID funding, helped draft a proposal that sketched out a profile of a new National Agricultural Research Organization (NARO) — its structure, organization, capital requirements, legal status, and so on.

In 1989, the government again got together with the World Bank and USAID, as well as other donors. All agreed on the need to draft a comprehensive strategic plan to rehabilitate the agricultural sector. ISNAR was again asked to assist on the research side. We posted a research management specialist to Uganda to collaborate with the Ugandan working group and provided guidance and support from headquarters. We also called on the expertise of several consultants.

The resulting report is a two-volume document titled "National Agricultural Research Strategy and Plan" which has been adopted by the Agricultural Policy Committee of the Ugandan government.

The centerpiece of the strategic plan is the creation of NARO. The umbrella organization will consolidate the country's nine research institutes, several substations, and 65 variety-testing sites into a smaller number of institutes, stations, and programs. Many of the management tasks will be decentralized to these components, with NARO headquarters con-

centrating mainly on planning, coordination, and monitoring of research.

The government has approved the creation of NARO and is now taking the necessary administrative and legal steps to set it up.

Three options for implementing NARO, ranging in cost from about \$17 million to a little over \$37 million over five years, are presented in the strategic plan. The government is still considering which course to follow and is negotiating with the World Bank for assistance with implementation. (A phase-in approach is strongly recommended in the plan.)

### *Setting priorities for research*

The strategic plan also identifies specific commodities, production systems, and other research problems for scientists to concentrate on in the short to medium term. These were selected and ranked in light of national development goals and with the help of weighted criteria. For example, the potential contribution to environmental sustainability, to small farmers' family income, and to national food security were all taken into account.

The 10 high-priority commodities are bananas and plantains, millets, maize, cassava, sweet potato, beans, groundnuts, selected vegetables, coffee, and cotton. The seven high-priority production systems and research areas are cattle, Lake Victoria-Kyoga fisheries, natural forests, soil productivity, plant protection, crop management, and animal nutrition and management.

The need for "a highly selective approach" to research that takes into account Uganda's limited financial resources "cannot be overemphasized", according to the plan's authors. The best results are likely to come from multidisciplinary teams of researchers working on problem-oriented projects.

The plan underlines the urgent need to improve incentives and conditions of service for scientists and to increase accountability in the research system. Performance must be the main criteria for recruiting and promoting staff. Research management, financial administration, and the provision of support services need to be strengthened.

Another problem the plan addresses is linkages. The years of war and civil strife left Ugandan researchers isolated from one another and from external sources of scientific knowledge. The strategic plan calls for an expansion of links between the government-run research system and other organizations, including Makerere University and international, regional, and private-sector agricultural research institutes.

Finally, the report recommends that formal mechanisms be set up to ensure the system is responsive to national

development goals and to the needs of technology users. These will include a National Agricultural Research Board to guide NARO, advise the government, and encourage the participation of farmers and other clients in the planning, conduct, and evaluation of research.

During 1991, ISNAR agreed to a Ugandan request for assistance with implementation of the national strategy and plan. One of the ISNAR management specialists who helped draft the plan has since been re-posted to Uganda for one year to advise on and assist with the Headstart project.

Uganda's crucial reconstruction effort in agriculture and agricultural research is now moving firmly ahead with strong donor support. If the next five years of work are successful, the country might even be able to one day reclaim one of its lost names — "Pearl of Africa".

## Bhutan

In many ways, the problems of agriculture and natural resource management faced by the tiny mountain kingdom of Bhutan are typical of small countries. Bhutan has only a handful of research scientists, a modest national budget, a complex natural environment, and as diverse a set of research problems to solve as some large countries.

The Royal Government of Bhutan is keenly aware that in these circumstances it needs a well organized and planned research system if it is to help its farmers grow enough food and other products in an environmentally sustainable way. It is fully committed to making the necessary changes.

In May 1991, responding to a Royal Government request for assistance,

ISNAR sent a team of two senior staff and a Swiss forestry consultant to Bhutan. Their three-week mission was to review the national system of research in the renewable natural resource (RNR) sector. The exercise was funded jointly by ISNAR and the Swiss Development Corporation.

A little background on Bhutan will serve to put in context ISNAR's collaboration with the national research system.

The landscape of this isolated and landlocked Asian country is still relatively unspoiled. The fast-growing population, however, is beginning to tax the natural resource base and the government is therefore keen to act as soon as possible to prevent damage.

Nestled in the Himalayas, Bhutan has a variety of natural resource management problems to solve. These include low crop yields, soil erosion, overstocking of farm animals, reduced fallow period of land used for shifting cultivation, and the need to ensure that forest exploitation can be sustained over the long term. Such problems are a major technological challenge to the country's mere 35 researchers working in the renewable natural resource sector.

### *Scarcity of arable land*

In the future, the major factor limiting agricultural production in Bhutan will be the scarcity of arable land. This means that the increased productivity required to meet the population's needs will have to come from better technologies. Hence, the government's commitment to improving research.

A number of problems afflict the fledgling national research system which

was set up a decade ago. There are only a small number of trained Bhutanese researchers and the country depends heavily on outsiders. In 1990, a quarter of the total complement of professional scientists were expatriates. There is also a problem of insufficient technical support, the ratio of scientists to technicians being only one to one.

Researchers in Bhutan also spend too large a proportion of their time on non-research tasks such as management, training, and extension. At the same time, there is a serious lack of coordination between research programs.

Finally, lack of funds and inadequate financial planning make it difficult for scientists to carry out research projects. Research facilities, for example, are inadequate. Only about 0.42% of the RNR-sector gross domestic product is currently invested in research for this sector. Although this percentage is about the same as for the less developed countries as a whole (average for the period 1981-85), it



- **Bhutan** is a mountainous landlocked country of South Asia, bordered by China on the North and India on the south. Its total area is 46,500 sq. km., of which 8.8% is arable.
- **Population:** 600,000
- **Main agroecological zones** (related to altitude): alpine, cool temperate, warm temperate, dry subtropical, humid subtropical, and wet subtropical.
- **Contributions to GDP:** Agriculture (crops and livestock), 33%; forestry, 14%.
- **Principal crops:** rice, maize, wheat, buckwheat, mustard, and pulses, for domestic consumption; potatoes, cardamom, ginger, citrus for export. Other major resource: timber.
- **Principal livestock:** cattle
- **Research capacity:** 35 national researchers in three research and extension/training divisions within Ministry of Agriculture, covering agriculture, animal husbandry, and forestry.

is much too low. The government plans to increase the percentage almost five-fold by 2002, with its own contributions relative to those of donors also rising.

ISNAR's diagnostic review of the research system in 1991 was conducted in close collaboration with a national task force. This comprised four senior managers from various divisions of the Ministry of Agriculture, plus supporting scientists. Their report notes that about 90% of agricultural production in Bhutan is by subsistence farmers. The cultivation of crops, raising of livestock, and use of forest products are interlinked, and together are woven into the fabric of routine daily life on farms. Forest litter and manure, for example, are collected to fertilize crops. Animals are grazed in wooded areas and fed crop residues. Ensuring that Bhutan's research and extension services are sensitive to the interconnected ways that farmers use natural resources was therefore an underlying theme of the review report.

The team's key recommendation was clearly spelled out: Bhutan needs to integrate its research and extension activities in agriculture, forestry, and animal husbandry. Although these efforts are nominally organized under the auspices of the Ministry of Agriculture, they are carried out in separate departments. This encourages research scientists to function along traditional disciplinary lines. As a result, it is difficult to design programs to address priority problems requiring a multidisciplinary approach.

### *Three organizational options*

The review report presented three organizational options and procedures to ensure the integration of research efforts. As the preliminary mission report states: "The aim is to create within the MOA [Ministry of Agriculture] a research organization

with a greater sense of common purpose." The options also aim to ensure good links between research, extension, and training, with the roles of each clearly defined.

The first option is the least interventionist, calling only for the creation of a coordinating subcommittee to ensure that research planning results in a common program of work for the three departments.

Under the second option, the research divisions of the three departments would be amalgamated into a single "division of renewable natural resources research". The departmental structure would be retained for nonresearch functions. The new research division would have a program structure including one or more intersectoral programs. An attractive variation on this option would be to include the technology transfer functions of the three departments, thus creating a new division of research and technology transfer.

The third option is the most radical. It proposes that, in addition to creating a new division of research and technology transfer (option 2), the three ministerial departments also be fully reorganized. Some nonresearch services would be decentralized under zonal administrators; others would be consolidated into central technical services.

While proposing the three scenarios to the government, the review team recommended the third as the best option. It also suggested that the proposed changes be put in place one step at a time, beginning with a strengthening of links between the research divisions of the existing Ministry of Agriculture departments.

Follow-up action by both the government and ISNAR was not long in coming. The mission report and recommendations were promptly reviewed and endorsed

by the government during the summer. The third option, calling for a major phased-in reorganization, was accepted, paving the way for an integrated Department of Research, Technology Transfer and Training.

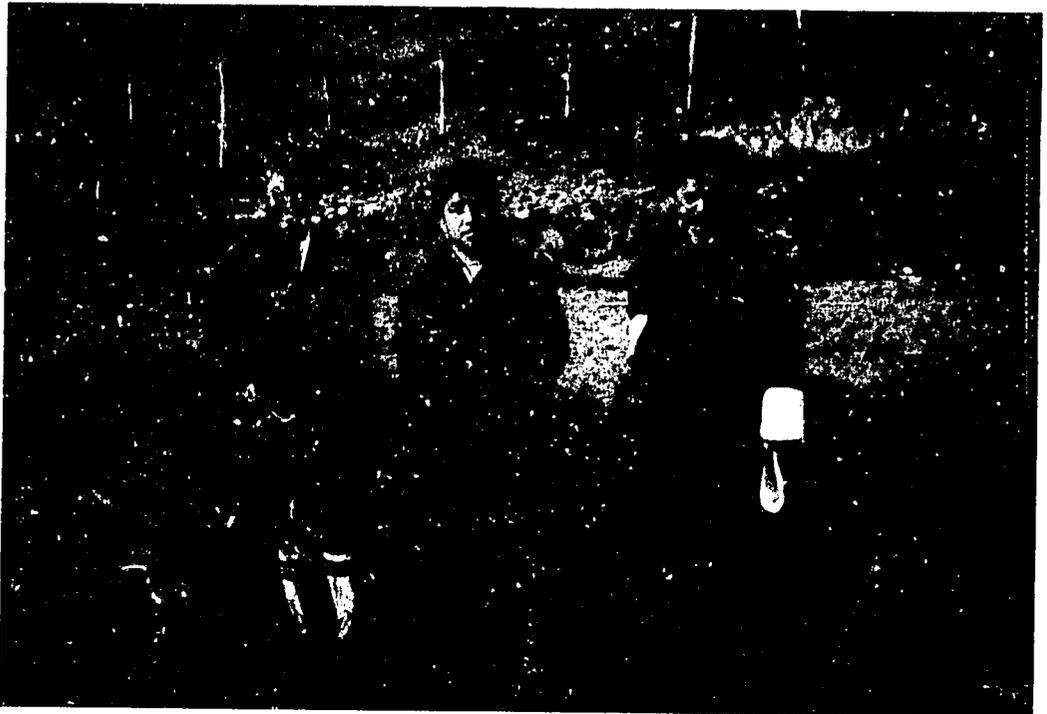
In September, the two ISNAR advisors returned to Bhutan to begin work with Bhutanese scientists, research managers, planners, and policymakers on the formulation of a strategic plan for research covering the period 1992-2002. The Swiss Development Corporation again provided funding for the exercise.

To ensure continuity, the ISNAR team worked with the same task force that had contributed to the diagnostic review. The participants — 30 research managers,

scientists, policymakers, and planners — were divided into several working groups. During a week-long workshop in the capital city, Thimbu, ISNAR staff met with the groups to familiarize everyone with the 13-step strategic planning process to be used. They also identified the various types of information that would need to be collected for use during the planning process — commodity production data, information on available research resources and technologies, details of ongoing research, and so on.

Each group later prepared an analytical background paper on the RNR topics assigned to it. These served as the groundwork for constructing the final

*Cropping, animal husbandry, and the use of forest resources are closely linked on small farms in Bhutan. A new national strategic plan calls for the integration of the government's research efforts in these three areas. This will allow scientists to address farmers' problems in a holistic way. Shown below are the Ministry of Agriculture's three key research leaders: (left to right) Pirthiman M. Pradhan, Head, Research Sub-Division (crops), Department of Agriculture; Jit Bahadur Gurung, Officer-in-Charge, Animal Husbandry Complex, Department of Animal Husbandry; and Lungten Norbu, Head, Research Division, Department of Forestry.*



strategic plan and their associated long- and medium-term research programs.

With this preliminary work completed, the main planning workshop took place in October and November. The ISNAR staff members, plus a forestry consultant and a livestock consultant, assisted in the two-week exercise.

Early on it was decided that the working groups would not organize their planning work around isolated commodities or agricultural subsectors as originally planned. Rather, their approach would be based on land-use patterns as embodied in six production systems found in Bhutan — dryland, wetland, plantation, pastoral, forest-based, and shifting cultivation (known as *tsheri*). This would

allow future research programs to investigate how various constraints and other factors within a particular mixed-production system interact with each other. In the case of rice, for example, there is a link between animal husbandry and the use of forest products because the fertilizer for rice cropping comes from tree litter and farmyard manure. The production-systems perspective allows for a more integrated approach to defining RNR-sector problems, determining research objectives, and designing research programs to tackle them.

In the section on research planning in Mali, on page 13, we described the process of program planning. Production constraints and opportunities are iden-

*Because of Bhutan's mountainous terrain, a diversity of natural environments can be found even in a small geographical area. In the capital, Thimbu, the great variety of agricultural products available at the main market (shown below) reflects this diversity. The rugged terrain, however, also makes it difficult and expensive for many farmers to transport their produce to market.*



tified and translated into research objectives; these in turn determine the design of research activities, projects, and programs. A somewhat similar planning process was followed in Bhutan.

With the decision to integrate research, there was a need to rationalize the existing research centers. Thus, four research complexes and four research-support centers are to be established. These complexes will be the "homes" of the new research programs where researchers in crops, livestock, and forestry can share research facilities. And having common technical and administrative support staff and services is expected to be more efficient and cost-effective.

The final strategic plan was completed in December, reviewed with ISNAR staff and consultants in The Hague, and printed in Bhutan. The Royal Government now has a comprehensive blueprint for the RNR sector over the next 10 years,

to be put in place in four phases over five years.

A major lesson ISNAR has learned in its planning work with Bhutan is that a favorable policy environment strongly enhances the process of change. When ISNAR staff reviewed the research system in May, the government had already reorganized its agricultural, forestry, and animal husbandry development activities under one umbrella — the new Ministry of Agriculture. It had also successfully combined the policy and planning functions of the three departments within one division in the ministry. This positive organizational environment, backed by the government's strong commitment to action, was an essential ingredient in successful strategic planning. It has also set the stage for what promises to be successful implementation of the plan and productive research in the years to come.

## INFORM — an information tool for managers

**A**gricultural research is a highly complex enterprise and it is increasingly information-based. While researchers rely heavily on up-to-date scientific and technical information in their day-to-day work, research managers require something quite different. To make good decisions, they need up-to-date information on what research is being done in which facility. They need to know how much research programs, projects, and experiments cost. And they need to know which scientists are doing what. In short, they need good management information.

Pulling all this disparate data together and analyzing it can be difficult and time-consuming. Especially so if a research system or institute is large and complex.

This led ISNAR to pioneer the development of a management information tool for research managers in developing countries. It is called INFORM — short for Information for Agricultural Research Managers. The Asian Development Bank provided substantial support for its development and testing, as well as for training of research personnel in Asia.

INFORM helps research managers with programming and budgeting, as well as with monitoring and evaluation of research. Its application depends on the time frame chosen for the analysis. It is an easy-to-use PC-based tool, and flexible enough to generate a variety of reports and graphics.

The system integrates research program information with information on re-

sources, especially people and funds. Staff time and corresponding costs are allocated to specific research projects. Operational costs are factored in as well. This allows the manager to analyze the budget from different angles, such as by commodity, discipline, or region.

ISNAR designed and tested the system from 1986-90. In late 1990, it launched a major training effort in cooperation with three Asian organizations: in the Philippines, the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD); and in India, the National Academy of Agricultural Research Management (NAARM). Some 60 Asian research personnel from 13 countries were trained.

### *Multiplying the effect*

The experience of both trainers and trainees provided valuable feedback for fine-tuning INFORM. It has also raised awareness among national research leaders of the potential benefits of management information systems. Equally important, the trainees themselves have become resource people for training and implementation of INFORM in their own countries. In effect, the training workshops have had a "multiplier effect" beyond what ISNAR, as a small organization, is now doing on a country-by-country basis.

NAARM, for example, building on the training workshop held in Hyderabad, has incorporated INFORM materials and procedures into its own "management information system" training program. Two courses were offered in 1991 for researchers working in institutes of the Indian Council of Agricultural Research (ICAR). Because of the sheer size of the

Indian NARS, the work of NAARM has great potential as a catalyst for improved information management throughout Indian agricultural research.

In 1991, ISNAR moved ahead with other efforts to disseminate INFORM. Following publication and distribution of a series of guidelines and training materials in May, we cooperated with research organizations in Sri Lanka, Indonesia, Thailand, the Philippines, China, Egypt, Bolivia, and Senegal to demonstrate and apply the system. We report briefly here on activities in each country.

**Sri Lanka** stands out for its rapid progress in introducing INFORM and is also the country that has worked most closely with ISNAR to develop the system. It is now making a coordinated effort to use the system throughout its 18 agricultural research centers and institutes, as well as at the national level. The Council for Agricultural Research Policy (CARP) and the Department of Agriculture conducted two training courses in 1991. Both organizations are using INFORM for their program planning and monitoring and evaluation.

**Indonesia** has been working to establish a research management information system for a number of years. Most of the country's research centers operate computerized data bases on personnel, finances, facilities, and programs, but they are not well integrated. In 1991, an out-posted ISNAR staff member assisted with preliminary work to link the data bases via INFORM. The aim is to serve the information needs of managers in the 37 institutes and centers under the Agency for Agricultural Research and Development (AARD). The Research Institute for Animal Production was chosen for a pilot study. Methodology and results were discussed at seminars with managers from AARD in Jakarta.

In **Thailand**, ISNAR worked with the Department of Agriculture (DOA) to introduce INFORM at the Chainat Field Crops Research Institute. The Thai team consists of personnel trained at SEARCA/PCARRD in 1990. DOA expects to integrate INFORM with its existing management information system, and to extend the methodology to its other institutes and divisions. A particular challenge for DOA and ISNAR is the conversion of INFORM data formats and outputs to Thai-language database software.

In the **Philippines**, PCARRD has begun to introduce INFORM at the University of Southern Mindanao, as has the Department of Agriculture at two of its institutes. The Philippine national INFORM team also consists of staff trained by ISNAR in 1990.

An agricultural institute in the People's Republic of **China** began work to adopt and adapt INFORM. Data from a number of departments within the Institute for Application of Atomic Energy, part of the Chinese Academy of Agricultural Sciences, have been collected and entered, and two training courses were offered in 1991. As in Thailand, a challenge facing research managers is to make INFORM operational in the national lan-

guage — in this case Chinese. This has required experimentation with other software.

ISNAR worked with **Egypt's** Agricultural Research Center (ARC) to initiate an INFORM pilot project at the Soil and Water Research Institute (SWRI). The project, funded by CEMARP (Canada-Egypt-McGill University Agricultural Response Program), began with a workshop to introduce senior officials from ARC institutes to INFORM. A team of three research managers from SWRI was selected to begin data collection.

In **Bolivia**, an ISNAR staff member introduced INFORM to managers at the Instituto Boliviano de Tecnología Agropecuaria (IBTA). Data collected from one of the institute's highlands research stations were used for the demonstration. IBTA is now planning to adopt INFORM, initially for its potato-research program, PROINPA.

**Senegal** is the first African country to experiment with INFORM. In November, ISNAR began preliminary work with the Institut Sénégalais de Recherches Agricoles (ISRA) and trained two ISRA staff in The Hague. ISRA's division responsible for fisheries research has been selected to demonstrate and test INFORM.

## Advisory Service around the world

*The following pages give brief highlights of ISNAR's advisory work around the world. Details of advisory work and training related to the use of INFORM, the ISNAR-developed information system for managers, can be found beginning on page 24.*

### Africa

#### **Burkina Faso**

An ISNAR staff member worked closely with senior research managers from the Institut d'Études et de Recherches Agricoles (INERA) on ways to resolve problems encountered in im-

plementing INERA's research strategy. Two of INERA's deputy directors spent two weeks at ISNAR headquarters to formulate the necessary procedures.

**Burundi**

ISNAR staff collaborated with the Scientific Commission and researchers of the Institut des Sciences Agronomiques du Burundi (ISABU) to improve the understanding and use of the standard program-formulation model and guidelines that were adopted in 1990. We advised the ISABU directorate on various management issues including staffing and personnel evaluation.

**Guinea Bissau**

As part of a continuing collaboration with the Departamento de Estudos e Pesquisas Agricolas (DEPA), ISNAR staff worked with researchers and managers on the rationalization and assignment of functions to the four regional research stations. In response to a government request, ISNAR reviewers, in collaboration with DEPA and the University of Upsala, Sweden, identified ways to ensure that a major agricultural R&D project implemented by the Swedish International Development Agency (SIDA) would contribute to the long-term institutional development of research in the country.

**Guinée Conakry**

In collaboration with the World Bank, and together with a team of managers from the Institut de Recherche Agronomique de Guinée (IRAG), ISNAR conducted an extensive human resources survey in each of the country's regional research centers. Workshops conducted with research-program coordinators, station managers, and department heads resulted in a manpower and training plan.

**Kenya**

ISNAR continued work with the Kenya Agricultural Research Institute (KARI) to apply improved management principles and methods to

the implementation of the national agricultural research plan. In addition, an ISNAR staff member began collaborative research with KARI on how policies have influenced the evolution of research programs and institutions in eastern Africa.

**Malawi**

An ISNAR consultant, on a four-week mission, visited most of Malawi's research stations and held consultations at the headquarters of several of the Agricultural Development Divisions. The mission's objective was to provide technical assistance in the areas of research priority setting and resource allocation in Malawi's NARS, including the Department of Agricultural Research.

**Mali**

See page 12.

**Rwanda**

ISNAR assisted the director and program leaders of the Institut des Sciences Agronomiques du Rwanda (ISAR) to improve research-project proposals and establish a standard format for research planning and program formulation.

**Sierra Leone**

ISNAR staff visited Sierra Leone on two occasions to assess the progress of the National Agricultural Research Coordinating Council (NARCC) and its potential to provide new directions for the NARS. NARCC is aiming for an organization that can provide the research institutions and components of the Ministry of Agriculture, Forestry and Natural Resources with a more flexible structure.

**Uganda**

See page 16.

## Latin America

**Bolivia**

In March, an ISNAR staff member led an external review of the potato program, the largest commodity program of the Instituto Boliviano de Tecnología Agropecuaria (IBTA). A central recommendation was that project budgeting should be introduced to allow management and scientists to review expenditures in comparison with program priorities.

**Costa Rica**

ISNAR continued a range of activities aimed at consolidating improvements that followed the

1988 diagnostic review of the agricultural research system. Assistance was also given to the Ministry of Agriculture and Livestock in the final preparation of a World Bank project to restructure the agricultural sector of the country.

**Ecuador**

ISNAR staff continued working with managers at the Instituto Nacional de Investigación Agropecuaria (INIAP) and with ad hoc committees. Progress to date was assessed and work advanced in several areas, including structure and organization, INIAP's autonomy, and institutional policy and strategy.

## Asia

### Bangladesh

An outposted staff member worked with the Bangladesh Agricultural Research Council (BARC) to develop a management information system for program budgeting in the 10 institutes coordinated by BARC. He also assisted in setting up a human resources data base for the entire NARS. Both tasks were part of phase 2 of a USAID-funded project to strengthen agricultural research. Although that phase ended in November, project funding has been extended to allow for a strategic planning exercise that will cover, among other things, human resources.

### Bhutan

See page 19.

### China

In collaboration with the Science and Technology Commission of Hebei Province, an ISNAR staff

member conducted a workshop on strategic planning for senior managers from a variety of research institutions and government departments.

### Malaysia

At the request of the Forestry Research Institute of Malaysia (FRIM), an ISNAR staff member gave guidance to FRIM management on research-planning processes. The consultations preceded a strategic planning exercise by FRIM. In view of the CGIAR's expansion of activities to include tropical forestry research, this special consultancy also benefitted ISNAR. It provided an occasion for identifying management needs of forestry research and to see to what extent ISNAR experience in agricultural research management is applicable.

## West Asia/ North Africa

### Morocco

ISNAR began preparing for a review of the entire Moroccan national research system, including the universities, research entities, parastatals, and the private sector. Two managers from the Institut National de la Recherche Agronomique came to ISNAR headquarters to devise guidelines for use by INRA managers in designing the institute's strategy and terms of reference for managerial functions.

### Sudan

ISNAR worked with the Agricultural Research Corporation (ARC) to implement ISNAR recommendations regarding the ARC Board, to introduce a computerized program-budgeting system, and to complete preparations for an exercise in strategic planning to take place in 1992.

### Syria

The Ministry of Agriculture and Agrarian Reform, in response to ISNAR recommendations, formed a research council in the Directorate of Agricultural Scientific Research (DASR) and drafted an agricultural research strategy to be discussed by Syrian policymakers. ISNAR assisted in summarizing the draft and provided suggestions on obtaining final approval for the document.

### Yemen

ISNAR guided a national study team in their collection of data on the Yemeni national agricultural research system using ISNAR-developed agricultural technology management system (ATMS) methodology.

## Special collaboration

### CARDI

An ISNAR staff member participated in a five-year external review of the activities of the Caribbean Agricultural Research and Development Institute (CARDI). The five-member team conducted the review at the request of donor agencies.

### CIMMYT

An ISNAR staff member headed a three-member external review mission to the International Maize and Wheat Improvement Center (CIMMYT), a CGIAR center in Mexico. The team was charged with examining a component of the CIMMYT wheat improvement program. The mission was part of CIMMYT's preparations for an overall five-year review of its work.

**CIP**

The International Potato Center, a CGIAR center in Peru, is reorienting its research program in line with its new strategy and in light of funding constraints. In connection with this work, a planning specialist from ISNAR assisted CIP in developing a priority-setting methodology for its research program as an input into its medium-term plan.

**Hungary**

A three-person team, headed by an ISNAR staff member, carried out a three-week review of Hungary's agricultural research system and submitted a report with recommendations to the government. The creation of a central coordinating institution for agricultural research was a major recommendation. During the mission, the team visited some 30 research institutes and met

with more than 100 senior research leaders and government officials. The review mission was fully funded by the Hungarian government with resources from the European Community's PHARE Unit (Pologne-Hongrie : Action pour la Reconstruction Economique).

**KARI**

At the invitation of the Kenya Agricultural Research Institute (KARI) and with the support of the European Community, a senior ISNAR staff member participated in a joint donor/KARI progress review of the multi-donor-supported National Agricultural Research Project. The review team paid special attention to management issues and elements of production-factors research in the project.

## II. Research

*In the sphere of institutional development and management of agricultural research, the national systems served by ISNAR have special requirements. Even among developing-country NARS, needs vary widely. They depend on the research system's size, level of development, resource endowment, mandate, types of producers and other clients to be served, and other factors.*

*Such differences put the onus on ISNAR to help devise approaches to policy, organization, and management that suit the range of NARS with which it works. The requirement for adapted or even custom-made "management technologies" is therefore the rule rather than the exception. At ISNAR, this development work calls for a mix of two kinds of expertise: practical experience in agricultural research management in developing countries and research based on a sound understanding of established management-related disciplines. These disciplines include organizational theory, economics, psychology, anthropology, public administration, informatics, and planning — to name a few.*

*Drawing on a variety of knowledge sources — including the NARS themselves — ISNAR operates an active research program. In 1991, its work accounted for 24% of ISNAR's budget, roughly in line with the guidelines in our medium-term plan for 1988-92.*

*The research program's products are important tools for our advisory and training work with NARS. In turn, our research efforts benefit from our advisory and training experience.*

*Research is carried out both with core resources and with supplementary funds provided through donor-funded special projects. The latter give ISNAR flexibility in responding to NARS' needs. They enable us to accelerate our work in a particularly important area, to broaden the geographical coverage of an issue, or deepen our analysis — beyond what core resources can accommodate. For example, our special project on small countries has allowed us to conduct case studies of seven countries and four regions and to collect key information on 50 countries for our data base. Doing this purely with core funds would have overtaxed ISNAR's response capacity in other areas.*

*Most of our research is centered around specific components or "critical factors" in research policy, organization, and management (see page 9). Apart from developing new tools and methods useful to NARS, the research program also has two other important jobs. First, it helps to sharpen ISNAR's own in-house capacity to diagnose and analyze problems in research management. Second, it monitors the state of national research systems around the world. For example, we gather information on the numbers and qualifications of scientists and technicians in NARS as well as the financial resources available to them. This data pool, in particular our Agricultural Research Indicator Series, provides the raw material for analyses of policy and other issues affecting NARS. (See page 42.)*

*Unlike our research on management tools and methods, which is aimed directly and principally at strengthening NARS, our "state of the NARS" work is geared for a broader audience. This includes policymakers, donor agencies, senior research leaders, and the international academic community.*

*In the pages that follow, we highlight four areas of recent ISNAR research: monitoring and evaluation of agricultural research, policy issues in biotechnology, the research system of China, and the planning, design, and maintenance of research buildings. These provide a rough cross section of our 1991 efforts to base our international service to NARS on a sound body of systematically accrued knowledge, complementing the individual NARS-related expertise and experience of our staff.*

*Finally, these highlights are followed by brief descriptions of six other areas of investigation by ISNAR.*

## **Monitoring and evaluation of agricultural research**

**A** multiplicity of social and economic factors determines technological change, making it difficult to evaluate the particular impact of national agricultural research. Many of these factors are outside the control of the research system. Attributing improvements at the farm level to specific research programs

conducted by a NARS may be inappropriate, even impossible. Likewise for efforts to assess the grass-roots impact of a research institution or the overall system of which it is a part.

Many types of research cannot be measured in current market terms. For example, basic research on land use,

agronomic practices, or farmer behavior is the foundation on which applied research can build, but it is not directly applied at the farm level where measurable changes in production occur.

Most agricultural research in developing countries is conducted by government and quasi-government organizations. The use of publicly provided technologies, such as improved agronomic practices and new nonhybrid varieties, may spread throughout the country, benefiting large numbers of people. But such innovations are difficult to patent or sell for profit, and therefore assessing their impact is a real challenge. Unlike private firms, public research agencies cannot directly use profitably and market signals to gauge the returns to their investment in R&D.

Another factor impeding research evaluation is the fact that research programs are often planned without clear goals. Without agreed-on targets and milestones, there is nothing against which to monitor progress and evaluate research results.

Despite these difficulties, managers, policymakers, and others with a stake in agricultural innovation do require concrete feedback on research efforts for the purposes of both internal management and external accountability. Information is needed to help set research priorities, plan programs, make adjustments to work in mid-stream, and justify expenditures to governments and donors. The scarcity of financial resources in many countries makes the issue of public accountability particularly pressing — accountability not only in the sense of showing that the funds were spent on the research activities for which they were earmarked, but also in the sense of demonstrating that the research was effective in achieving social goals.

Unfortunately, much of the world lit-

erature on monitoring and evaluation of agricultural research relates to the assessment of donor projects and is thus of marginal use to NARS managers.

ISNAR's efforts to assist national systems in this area of management centered on three areas of activity in 1991.

#### *Ex post evaluation: three studies*

ISNAR economists used rate-of-return analyses to conduct *ex post* (after-the-fact) evaluations of research on several commodities in three countries. In each case, the work was conducted jointly with national collaborators.

In Ecuador, an evaluation of rice research and extension was completed. Supported by the Fundación para el Desarrollo Agropecuario (FUNDAGRO), it built on experience gained from two earlier studies in Uruguay and Bolivia. The two investigating economists — one from Ecuador's Instituto Nacional para el Investigación Agropecuaria (INIAP) and one from ISNAR — examined the impact of improved rice seed and agronomic practices developed by INIAP. The study indicated a rate of return of 31 to 47% on investments made in the technology package between 1970 and 1990. This falls within the range of rates of return calculated by other commodity studies, and exceeds the returns to most developing-country public investments generally.

In August, economists began a one-year study of the impact of investments by Indonesia's Agency for Agricultural Research and Development (AARD) in rice and grain legume research. The evaluation covers the period 1975-90. Supported by USAID, the work is being done jointly with the Center for Agricultural Research Planning (CARP). Preliminary indications are that research on varietal improvement and on crop and pest management has contributed significantly to

both the maintenance of yield gains from past investments in research and to the intensification of rice production.

Finally, in Niger, work began in late 1991 on the evaluation of investments in research on millet, sorghum, and cowpeas — three of the country's main crops. The study, due to be completed in September 1992, is supported by USAID through Michigan State University, U.S.A., with a further contribution from the Belgian government. It covers the period from the mid-1970s, when the Institut National de Recherches Agronomiques du Niger (INRAN) was created, to the present.

In evaluating the performance of such a young national system, the researchers are being careful to distinguish between two types of investment: those in research per se and those related to the overall development of Niger's national research system. The latter include crucial institution-building activities such as training scientists and building and equipping laboratories. The stream of research-related benefits deriving from investments in physical and human resources is likely to be of a longer-term nature than the benefits of direct investment in specific research activities. Hence the double-barrelled approach to the Niger study.

#### *Latin America and the Caribbean: a project to learn by doing*

During the year ISNAR drafted a proposal for a major regional project to help strengthen the planning, monitoring, and evaluation of agricultural research in Latin America and the Caribbean. The 18-month project, funded by the Inter-American Development Bank (IDB) and due to begin in 1992, will combine research with advisory and training work.

Regional and subregional organizations, including the Inter-American Institute for Cooperation on Agriculture

(IICA), will cooperate on the project.

In preparing for the project, an ISNAR specialist conducted three preliminary country case studies — in Argentina, Brazil, and Colombia — to identify problems and opportunities for improvement in research monitoring and evaluation. The case studies will serve as models for similar country-specific work by national investigators in four subregions: Central America, the Andes, the Southern Cone, and the Caribbean.

When the country experiences are well documented, participating organizations will design and hold a training workshop for research managers in each subregion. The project will also produce training materials and publications in both Spanish and English. Project results will be presented and evaluated in a final regional workshop with national research managers from throughout the region and will flow into ISNAR's service to NARS generally.

#### *Three publications*

ISNAR staff made good progress in preparing the first draft of a source book on monitoring and evaluation, aimed at agricultural research managers and evaluators. It should also be useful to development agencies, educators, and trainers.

The book is to be published in early 1993 in cooperation with CAB International and with financial support from IDRC. Intended as a concise guide to information and expertise in monitoring and evaluation, it will also include a glossary and discuss a variety of subjects. Among them:

- institutional processes such as strategic planning, project budgeting, internal reviews, and impact assessment;
- methods of monitoring and evaluation

such as the use of checklists, economic evaluations, farm-level studies, scoring, and peer review;

- CGIAR external review procedures;
- data collection and analysis;
- human resource planning;
- forestry research evaluation.

The draft of a second major manuscript underwent external peer review and revision. The work examines the theory and practice of two types of economic evaluation — *ex post* and *ex ante* (at the planning stage) — and discusses their use in set-

ting priorities for research. The book is to be published for ISNAR in late 1992 by Cornell University Press.

Finally, during the year ISNAR published a summary report of a meeting held in November 1990 (reported in the 1990 Annual Report). "Monitoring and evaluation of agricultural research: Highlights of a consultation" summarizes discussions by national research leaders on the state of monitoring and evaluation in national research systems. It records their views on the needs of the national systems, as well as suggestions for what ISNAR can do to assist.

## Issues in biotechnology

**M**odern biotechnology encompasses a number of recently available technologies, particularly those based on the use of recombinant DNA procedures, monoclonal antibodies, and new cell and tissue culture methods. This "tool box" has already proven immensely useful in many areas of agricultural research, particularly plant breeding and protection.

Biotechnology is widely recognized to be a highly complex area of innovation — scientifically, economically, socially, and politically. It is evolving very quickly, will affect all countries, and poses a number of often controversial issues that require international and inter-institutional cooperation to be resolved. ISNAR believes that a wide-ranging exchange of information among the various stakeholders is vital if biotechnology is to be exploited by developing countries. This consideration underpins much of our work in this area.

During the year, three of four country case studies, funded by the Government of The Netherlands, were completed. ISNAR also hosted two international

meetings on biotechnology.

The studies, conducted by national collaborators, examined the status of biotechnology in Kenya, Zimbabwe, and Indonesia, including opportunities and constraints on its use, and suitable roles for donor agencies. A fourth case study in Colombia is in progress. In all four countries, national biotechnology-coordinating bodies have either been set up or are now being planned. Together with 10 earlier country studies by ISNAR, this information is being assembled into a data base to allow ISNAR staff and other specialists to make cross-country comparisons. Summaries of the studies are expected to be published in 1992.

### *Biosafety and intellectual property management*

The two meetings hosted by ISNAR, in April and September, provided opportunities for participants to learn more about current national and international activities in biotechnology. The information exchanges focused mainly on policy

and regulatory issues related to intellectual property management and safe release of genetically modified organisms. Highlights of the discussions of both meetings can be found beginning on page 50 of the Training and Conferences section.

Finally, as a logical follow-up to our consultations with stakeholders and our country-specific fact-finding studies, ISNAR began planning concrete measures to directly assist developing countries. To this end, we worked with

BIOTASK (the CGIAR Biotechnology Task Force) on a proposal to establish a biotechnology advisory and training service to developing countries. The proposal was discussed by donors in Washington at the end of October. The service will cover a range of management and policy issues and is expected to become operational (on a limited basis) in mid-1992 with financial support from the Government of The Netherlands and other donors.

## China: studying the world's largest NARS

**I**n parallel with its distinction as the world's most populous country, the

People's Republic of China also has more scientists and engineers doing agricultural research than any other nation. Their efforts, along with those of extensionists, contributed significantly to China's remarkable four-percent annual growth in agricultural production between 1949 and 1989. This was the highest growth rate among the socialist countries, and it was greater than rates seen in most developing countries. Much of the progress centered on the introduction of high-yielding hybrid and dwarf crop varieties.

The complex Chinese research system, though, is not well understood by outsiders and has itself admitted a number of weaknesses. Improved knowledge of the national system would, to begin with, be a good base from which Chinese leaders could strengthen its performance. Second, it might also provide lessons for other large countries such as Brazil, India, and Indonesia. A third benefit relates to enormous contribution of China to international trade, both as an importer and exporter of agricultural commodities. The extent to which such a large country is or

is not self-sufficient in food production has a profound impact on agriculture around the world. An improved understanding of the contributions of national research to the process is of obvious value to the world community.

With these factors in mind, ISNAR and China launched a two-and-a-half-year study of the world's largest NARS in early 1990. The project is funded by both the Rockefeller Foundation and ISNAR, and is being conducted in collaboration with the Institute of Agricultural Economics of the Chinese Academy of Agricultural Sciences (CAAS) and the Center for International Food and Agricultural Policy (CIFAP) of the University of Minnesota, U.S.A.

The project has three main aims:

- to describe the Chinese agricultural research system, including its institutional development and the growth of research capacity;
- to estimate the impact of agricultural research on production growth at both the national and regional levels;
- to conduct a preliminary analysis of key policy issues affecting resource al-

location to research on crop production, forestry, livestock, and fisheries in different regions.

### *Indicators of research*

During 1991 the project centered on three tasks. The first was to continue compiling a set of quantitative indicators on the Chinese agricultural research system. This work, begun in 1990, was continued by the main researcher who conducted a field trip in China and updated all the information.

The second task was to prepare a final version of a monograph on the development of the Chinese NARS, its structure, funding, and personnel strength and training. The monograph, to be published in 1992, will cover the period from 1949 on. It is expected to be the most comprehensive English-language description of the evolution of the Chinese NARS to date. In addition, a paper on the impact of agricultural research on production growth was prepared for an international conference on Chinese agricultural development to be held in Beijing. The

conference sponsors are the American Agricultural Economics Association, the Agricultural Economics Association of China (People's Republic of China), and the Rural Economics Society of China (Taiwan).

The third task was to begin preliminary work on priority setting for the Chinese agricultural research system. A research fellow from China received training at ISNAR headquarters and a project proposal was prepared. A pilot study will be initiated in 1992 to test various priority-setting methodologies and adapt them to Chinese conditions.

ISNAR's China project is but a modest beginning in the attempt to understand and analyze the world's largest and possibly most complex agricultural research system. To date, quantitative analyses of the nature and impact of China's NARS have been sparse. This new work, then, should prove invaluable to those making important decisions about which programs to fund and how much to spend on them.

## **Planning and designing research buildings**

**M**anaging physical resources is one of the critical tasks of agricultural research leaders. The most important of these resources, at least in terms of capital investment, are the laboratories, offices, libraries, workshops, garages, farm buildings, storage facilities, and housing found at research institutes.

Early in 1991, ISNAR launched a global study on the planning, design, and maintenance of such facilities. It is funded in part by the Danish International Development Agency (DANIDA) and the Belgian Administration for Development Cooperation (AGCD).

The data collection and analysis are being carried out by a consulting architect with long international experience in the design of agricultural research facilities. During the year he investigated the status and problems of research-building design and maintenance in nine countries in three regions of the world — Latin America, Asia, and Europe. This information was gathered mainly through visits to facilities and interviews with policy-makers, research managers, and architects, as well as the employees who use the buildings. By the time the study is completed in mid-1992, data will have

been collected from about 100 research institutes and stations in a total of 20 countries, including several in sub-Saharan Africa, West Asia / North Africa, and North America.

The principal product of the project will be a set of published guidelines aimed at policymakers, research managers, architects, and donor organizations. It will cover a variety of practical topics such as building layout, space requirements, costs, lighting, heating and cooling, design of work spaces, safety, construction materials, and maintenance.

### *A problem of maintenance*

Investigations to date indicate that agricultural research buildings in many developing countries are in a critical state of disrepair. The problem is clearly that the importance of maintenance is not fully recognized and sufficient funds are therefore not set aside for it. A number of experienced research managers have suggested that allocating 2 to 3 percent of current value of research buildings for maintenance would be appropriate in most developing countries. On average, however, these countries are currently spending only 0.3 to 0.6 percent.

The consultant emphasized that there are a number of attractive low-cost options in building design and maintenance. For example, including skylights in the design can cut recurring costs for lighting maintenance and electricity. Similarly, new research buildings in tropical countries could be designed to maximize natural cross-ventilation, thus reducing the need for expensive air conditioners.

Among the study's other preliminary findings and observations:

- On the subject of planning and design of research buildings there is a serious shortage of practical information

geared toward developing-country research managers and architects. There is also a clear demand in developing countries for guidelines in this area.

- Many research laboratories and other buildings suffer from inflexibility of design. That is, they have been conceived without regard to the fact that the scale or type of research may change over time. Retrofitting them therefore requires costly materials and labor. For example, electrical conduits and plumbing may have been imbedded in walls or concrete floors. This makes it very difficult to reconfigure a laboratory in order to expand or otherwise alter research activities.
- Safety is a major problem in many research institutes in developing countries. Fire extinguishers may hang on walls for many years without being periodically tested to see whether they still work. Emergency fire hoses are frequently missing. Chemicals are sometimes stored on open shelves rather than in protective cabinets. In the absence of adequate filing space, stacks of papers and reports are often loosely piled in the corners of offices, posing a fire hazard. And sometimes laboratories are not equipped with showers in case employees are accidentally exposed to dangerous chemicals. Many such problems can be corrected by improved building design and maintenance.
- New buildings are often planned and constructed in isolation — that is, without regard to the overall situation at a research site. Before any new construction takes place, it is essential for management and planners to evaluate the use of existing buildings and space in light of the real needs of the research

program and staff assigned to it.

- Research managers must be realistic in assessing their needs. Construction of overly prestigious research complexes does nothing to enhance the quality of agricultural research. In the current period of stagnant and even constricting funding for agricultural research, facilities must be modest, well constructed and easy to maintain. Sometimes new structures are not the most economical answer. Renovation of older buildings — and, in the case of some utility and storage buildings, construction based

on simple designs and inexpensive local materials — can be attractive options for the cost-conscious manager.

- Donor agencies that fund the construction of research buildings sometimes include general provisions for maintenance in their agreements with recipient institutions. However, these provisions most often do not clearly spell out a schedule of maintenance activities or the proportion of resources which must be allocated for them in the budget.

*Workmen renovate facilities at the National Council for Scientific Research in Lusaka, Zambia. Remodelling rather than new construction can be an attractive option for the cost-conscious manager.*



## Other research

### Small-countries study: the home stretch

Small developing countries have modest resources at their disposal for research, yet the agricultural problems they need to solve are often as complex and diverse as those of large countries. And because of their size, many small NARS do not receive the same attention from national and international development agencies as large ones.

The main aims of ISNAR's two-and-a-half-year Small-Countries Study are to identify suitable organizational models and management strategies for small NARS and to help both ISNAR and donor agencies better address the needs of these national systems. Research and analysis continued in 1991, with this phase of the project now nearing completion. The researchers have classified and assessed the agricultural research capacity of 50 small developing countries and guidelines for managers and policymakers are to be published in late 1992.

The project, funded by the governments of Italy and Denmark, includes in-depth case stu-

dies of seven countries whose agricultural research systems and problems are considered representative of small countries. The work has been carried out by senior research leaders from the countries involved. The studies in Honduras, Sierra Leone, Togo, and Fiji were completed in 1990, and the Jamaican study in 1991. Work in Lesotho and Mauritius will be finalized in 1992. Three regional studies were also completed — for the Caribbean, southern Africa, and the South Pacific.

During the year, ISNAR added a new component to the project. With funding from the Technical Centre for Agricultural and Rural Cooperation (CTA), we began an investigation of small countries' scientific information activities and needs. This related project, coordinated by ISNAR's librarian, looks at the ways small-country research systems obtain, screen, store, and manage information.

This information-related work complements the overall study, since small countries, more than larger ones, rely heavily on borrowing tech-

*A shaded patio outside the Macadamia Centre at the National Horticultural Research Centre in Thika, Kenya. This is a good example of what can be done inexpensively to create a pleasant working environment for research staff.*



nologies from outside sources. Case studies on Trinidad and Tobago and Swaziland were completed during the year. Two others, on Mauritius and the Seychelles, will be ready in 1992. In each instance, the case material is being prepared by an information specialist from the country concerned.

### **Links between research and technology transfer**

Like the small-countries project, ISNAR's study of the linkages between agricultural research and technology transfer is now nearing completion.

ISNAR launched this four-year study in 1988 with special-project funding from the Italian and German governments and the Rockefeller Foundation. It did this in response to numerous requests from NARS for assistance in this area and because of growing concern among both donors and NARS that poor relations between research and extension were blocking the delivery of technologies to farmers.

As part of the study, three ISNAR staff and four collaborating experts prepared papers in 1991. These synthesized the findings of earlier country case studies covering technology subsystems in Colombia, Costa Rica, Côte d'Ivoire, the Dominican Republic, Nigeria, the Philippines, and Tanzania.

In May, a meeting at ISNAR headquarters brought together most of the participants in the linkages project. This gave the synthesis writers and case study researchers a chance to clarify linkage issues and points of information. It also allowed for a further review of the project's methodology and approach. Five of the synthesis papers were presented at the meeting.

Each synthesis paper examines a specific linkage-related theme or question, drawing on the experiences of several countries. For example: How do differences in the professional status of researchers and technology transfer agents affect the operation of linkages in various countries? How does the level of resources available for setting up, maintaining, and managing linkages affect their performance? And, how do linkages succeed or fail when external pressure from farmer organizations, policymakers, and other stakeholders is applied to technology systems?

Based on the seven thematic analyses, the project leader produced the first draft of a monograph, scheduled for publication in 1992. This "synthesis of the syntheses" will present the issues, make recommendations, and give guidelines to help NARS managers diagnose linkage problems and identify solutions. Some of the thematic synthesis papers will be published separately. In addition, a method for diagnosing and

analysing linkage problems has been developed and will be tested in 1992.

In the meantime, one donor has expressed strong interest in supporting a second phase of this linkages work. If additional special funding becomes available, ISNAR will extend the study to cover linkages between research and farmers, specifically farmer organizations. It will also move ahead with the preparation and dissemination of training materials on all major issues covered by the overall project.

### **Women in agricultural research**

The proportion of professional women researchers working in Third World NARS varies widely between countries — from less than one percent in some cases to more than 50 percent. On the whole, though, the ratio of women to men is increasing.

During the year, the ISNAR team examining gender issues worked with a consultant from Princeton University. Together they formulated a conceptual framework for analyzing gender-related staffing in NARS. The resulting analytical paper suggests that ISNAR's contribution in this area can best be made from the management perspective of efficiency — namely, that women constitute an underused pool of scientific talent and that managers need to make optimal use of all available human resources to achieve stated objectives.

This preliminary paper was released as a Staff Note with limited distribution, intended to stimulate a dialogue between ISNAR and NARS leaders. We hope this will lead to collaboration with national systems on strategies for increasing women's participation in agricultural research. Two in-house seminars during the year also served to introduce and sensitize ISNAR staff to these issues.

In a complementary initiative, another ISNAR staff member took a leading role in examining the gender-staffing issue within the CGIAR. This work is a component of the inter-institutional CGIAR Gender Program, which is also looking at the impact-related question of how agricultural research is responding to the needs of women producers in developing countries ("gender analysis"). As part of the program, the ISNAR staff member acted as a resource person at a sensitization seminar for senior managers from 11 CGIAR centers in November in Washington, D.C. She continues to work with the CG Secretariat on these issues.

Although ISNAR had broached gender-related issues in the mid-1980s, this effort was not followed up. Our work in 1991 marks the beginning of our systematic involvement in this area.

In the belief that it is best to take one step at a time, we have chosen to focus our gender-related work initially on the staffing issue. This is the area that falls directly within our mandate of advising NARS on human resources development and management for agricultural research.

### Public- and private-sector roles in research

ISNAR continued its research, begun in 1990, on the roles of the public and private sectors in national agricultural research. Given the global trend toward privatization and the tightening of government budgets in many countries, we believe the interplay between the two sectors needs to be better understood. In particular, we are working to identify areas where public and private organizations can complement each other's work, as well as alternative funding sources and mechanisms for research.

At the same time, USAID, a strong supporter of public-sector agricultural research in sub-Saharan Africa, has been re-examining its approach to development assistance in the region. The agency's new "strategic framework" for supporting research puts increased emphasis on the role of private-sector organizations in research — as participants, clients, and financial investors. USAID hopes this will encourage research to become both more responsive to the internal and external markets that can stimulate production increases and more accountable to its stakeholders.

ISNAR's and USAID's common interest in public/private-sector interactions led to an agreement in 1991 to examine the issue in Africa. With USAID funding, ISNAR conducted a "desk" study of the links and division of labor between various organizations that form the broad continuum between public and private research. These include government research departments, autonomous institutes, universities, commodity boards, foundations, nongovernmental organizations, farmers' organizations, and commercial firms producing agricultural inputs such as fertilizer, equipment, or seed. An important part of the study was to look at the implications of public-private interactions for government policy.

The resulting report to USAID profiles public and private agricultural research across sub-Saharan Africa. This includes a preliminary (but still incomplete) list of private-sector organizations in about 20 countries and the nature of their research.

Among other things, the report looks at the division of research tasks between the two sectors according to the type of technology to be developed (agronomic, chemical, mechanical,

biological, environmental) and the type of research (basic, strategic, applied, adaptive) to be conducted. These two factors strongly influence the extent to which research results yield a payoff that accrues to the benefit of the research organization through royalties, technology licensing fees, and other mechanisms.

The study suggests that incentives for private research are greatest for mechanical technology, followed by chemical, then biological technology. Managerial technology is the least attractive investment to the private sector, while national environmental concerns may rarely be addressed. The authors underline the importance of the public sector's role in coordinating research to ensure all important research problems are covered. In a number of important areas, there will be a continuing need for public institutions to conduct research that is crucial to the public good but which may not interest the private sector. Examples include basic biological research, agronomic research, and environmental studies.

The report also discusses policy and linkage mechanisms to strengthen public-private interactions in research. To name a few: national science and technology councils, the introduction of intellectual property rights, improved trade and pricing regulations, contract research, joint ventures, consultancies, participation in professional societies, sabbaticals, and exchange programs.

ISNAR work on public/private research issues will continue in 1992 with a pilot study in Ecuador.

### Priority setting for research

Last year we reported in some detail on a major project to develop a computer-assisted method for helping agricultural research managers to set their priorities. The method makes it possible to assess the effects of shifting research resources from one commodity or set of commodities to another, from one agroecological zone to another, or from one type of R&D to another. For example, research planners can calculate the potential payoff of applying a research program's results — say, new rice varieties or farming techniques — in agroecological zones beyond the original target area.

The use of the computer-simulation method requires several kinds of information. These include agroecological data, commodity prices, production and consumption statistics, and scientists' estimates of the likely outcomes of research.

The ability to forecast the economic impact of research, especially the beneficial "spillover" effect between zones, can be a powerful tool in the hands of research planners. It helps them quan-

tify the extent to which programs are likely to generate research benefits for both producers and consumers and how to rank them. This is why the researchers refer to their computer-simulation technique as a "decision support structure".

The three-year project is a joint effort by ISNAR, Australia's ACIAR, and the national research systems of Indonesia, Papua New Guinea, the Philippines, and Thailand. ISNAR's main involvement, funded by Germany's BMZ, has been with Indonesia. There we have forged a close partnership with the Center for Agro-Socio-economic Research (CASER) within the Agency for Agricultural Research and Development (AARD).

During the course of the year, ISNAR worked with CASER staff in Bogor to verify and fine-tune the large quantities of economic and other information collected during the first stage of the project. Several CASER analysts also came to ISNAR to help develop research-evaluation simulations.

In May, the CASER-ISNAR team participated in an ACIAR-sponsored regional workshop in Kuala Lumpur, Malaysia. Researchers from all the participating countries discussed their preliminary findings. Later, in July, CASER and ISNAR organized a one-day workshop at AARD headquarters in Jakarta where they presented their priority-setting techniques to senior managers from AARD and various Indonesian research institutes. The feedback from this meeting will guide AARD in its efforts to institutionalize national capacity in research evaluation and priority setting.

ISNAR expects its priority-setting techniques

will find application in national research systems well beyond Indonesia and the three other countries participating in the project. Thus, in parallel with our collaboration with CASER, ISNAR staff continued work on a major book on the theory and practice of agricultural research evaluation and priority setting. It is expected to be published by Cornell University Press early in 1992. Development of a complementary computer software package is well advanced.

### Lessons from Spain

Finally, a note about an ISNAR study of the national agricultural research system of Spain.

One recommendation of the 1991 External Review of ISNAR's work was that the institute should direct some research effort to studying the research-management experiences of industrialized countries. Even before the recommendation was made, ISNAR had become involved in a major World Bank study of agricultural research in Latin America. As part of that work, we proposed to draw lessons from a developed country that might be applicable to Latin America. Spain was selected because its NARS has successfully dealt with issues of growth, decentralization, and integration of the universities and private sector.

Working during 1991 with a professor from the University of Cordoba and with the cooperation of the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), we produced a preliminary paper describing the Spanish research system. An edited version will be published in English and Spanish by the World Bank.

## Agricultural Research Policy

**Agricultural Research Policy: International Quantitative Perspectives.** Edited by P.G. Pardey, Johannes Roseboom, and J.R. Anderson. Published for ISNAR by Cambridge University Press. 1991. 486 pp. ISBN: 0-521-40009-0. Price: £27.50. Available from Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, U.K. A 24-page summary of key issues and data presented in the book is available from ISNAR's Publications Services.

**World demand for food and other agricultural products is growing. This puts a major responsibility on agricultural research to help farmers achieve the increases in production and productivity that will be necessary to meet demand. In this context, it is clear that agricultural research policy is an integral part of agricultural development policy.**

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*Agricultural Research Policy* reports the investigations by a dozen economists into the major policy dimensions of agricultural research, both national and international. The main focus is the developing world. The authors, who present 100 tables and more than 30 figures in their book, take a quantitative approach. The data are drawn mainly from a companion volume, *ISNAR Agricultural Research Indicator Series*, also published by Cambridge University Press. *The Indicator Series* documented research expenditures and staffing levels for some 150 national agricultural research systems (NARS) between 1960 and 1986; *Agricultural Research Policy* presents several distinctive syntheses and interpretations of this data set.

The book consists of five parts. The first addresses the issues of political economy, international policy, sustainability, and uncertainty that surround agricultural research. Part two reviews measurements of agricultural research and economic development. Parts three and four focus on public and private agricultural research, respectively. The closing section lays out some of the key challenges facing agricultural research over the next few decades.

Here are a few of the major quantitative findings:

- The less-developed countries' share of the world's public agricultural research capacity, particularly human resources, has substantially increased over time. In the early 1960s, 33% of the world's agricultural researchers (excluding those in the former USSR and Eastern Europe) were located in the less-developed countries. By the early 1980s, the proportion had grown to 58%.
- Growth of agricultural research expenditures faltered during the late 1970s and early 1980s in many less-developed countries, particularly in sub-Saharan Africa and in Latin America and the Caribbean. These are also the regions that have been most affected by external debt and economic crises.
- Throughout the 1970s and in the early 1980s, the number of agricultural researchers in less-developed countries often grew faster than expenditures. In effect, there was a widespread decline in expenditures per researcher throughout the developing world.
- Data on agricultural research expenditures as a share of total agricultural expenditures by government suggest that less- and more-developed country governments give the same priority to agricultural research. However, low-income countries spent a larger proportion of their total government budget on agricultural research than high-income countries.
- Between the early 1960s and the early 1980s, the average size of less-developed NARS quadrupled from 150 researchers to 600. Nevertheless, 95 of the 130 NARS in less-developed countries still employ fewer than 200 researchers and 39 systems fewer than 25 researchers. Only 14 employ more than 1000 researchers.

Following up on the work documented in the *Indicator Series* and *Agricultural Research Policy*, ISNAR began preparations in 1991 for another round of data gathering. In 1992, work will focus on the NARS of sub-Saharan Africa.

### III. Training and Conferences

*Training events and conferences during 1991 provided valuable opportunities not only for the exchange of information among NARS leaders, policymakers, and ISNAR staff, but also for research managers to improve specific skills. These activities also contributed feedback and suggestions from NARS leaders regarding our new institutional strategy for the 1990s.*

*During the year, ISNAR staff contributed to 31 training events and conferences (consultations, seminars, workshops, and other major meetings) in 16 countries. In most instances, we collaborated with a partner institution in delivering practical tools for improved research management; in some cases, we organized the event ourselves; and in a few, we provided specialized resource persons for events organized or sponsored by others. In 1991, training and conferences accounted for about 17% of ISNAR's core program expenses.*

*Training activities in 1991 marked an important shift in both content and target group. While training events in the past were designed mainly to increase senior policymakers' awareness of research management as a discipline, our success in meeting this goal has allowed us to shift the focus towards the development of specific management skills by middle-level managers. Training events in 1991 stressed skills such as priority setting, resource identification and management, mid- and long-term strategy formulation, the use of management information systems, and human resources planning and development.*

*The following section describes two major training projects — in Kenya and the SADCC region — and a national research management workshop in Nigeria. It also provides highlights of four consultations, either sponsored or co-sponsored by ISNAR and covering the following topics: research management in Asia; challenges facing world agriculture and agricultural research during the next two decades; and biotechnology policy. Such consultations often serve as a catalyst for ISNAR training events or research projects. A full listing of 1991 training events and conferences is provided at the end of the section.*

## Southern Africa: continuing cooperation with SADCC

**W**ith the successful completion in 1991 of phase 1 of the Agricultural Research Management Training (ARMT) Project, NARS of the southern African region progressed one step further on the road to strong agricultural research management.

More than 500 mid- to senior-level NARS managers participated in the project, which was a cooperative effort by ISNAR and the Southern African Development Coordination Conference (SADCC). Member countries of SADCC are Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe, and Namibia.

During phase 1 of the project, which began in 1986, 19 workshops were organized. Funding was provided by the Canadian International Development Agency, the U.S. Agency for International Development, and the Overseas Development Administration of the U.K. The project's focus was training managers to effectively plan, organize, and manage agricultural research. The diagnosis of research system strengths and weaknesses, along with the planning and management of change, were highlighted. Policy issues were addressed through workshops stressing the importance of research for sustainable agriculture and the need for research systems to influence the policy environment.

There were three main project events during 1991:

- The Windhoek Regional Policy Workshop, November 18-20. During this meeting, 27 directors of research, policymakers, and representatives from international organizations met in the Namibian capital to discuss the important relationship between agricultural development policy and agricultural re-

search policy. Creating a favorable environment for agricultural development was stressed and participants established an agenda for future research policy activities.

- The Zimbabwe National Workshop, February 25 - March 7. Some 30 researchers and managers from Zimbabwe reinforced their strong commitment to the creation of a long-term research strategy by drafting four mission statements. The statements reflected four features of research management: planning and administration, resource management, technology-transfer linkages, and information management.
- The Sub-Regional Workshop for Preparation of a Framework for Research Planning, May 6-10. During this training event, teams of senior researchers from three countries of southern Africa — Botswana, Lesotho, and Swaziland — learned methods for preparing a long-term agricultural research strategy. Among the highlighted topics were system reviews, strategic planning, priority setting, human resource planning, and information management.

Other project outputs included the development and collection of materials for future training in the region and of case studies spanning the fields of policy, planning, program formulation, and human resource management.

During the year, project organizers also designed phase 2 of the training project. During this phase, support for training in agricultural research management will be transferred from ISNAR to the SADCC region. Efforts will thus focus on institutionalizing the region's own capac-

ity to train research managers. More African trainers will be trained and management institutes in the region will be

strengthened. The second phase is to be funded by a \$1.5 million grant from USAID and should begin in mid-1992.

### Kenya: six training events with KARI

Six workshops attended by about 150 research managers and policymakers were organized by the Kenya Agricultural Research Institute with support from ISNAR staff during 1991 as part of the second year of the KARI/ISNAR Management Linkage Training Project. The training supports a broader collaboration between ISNAR and KARI.

The 1991 workshops were among the 25 events planned under the five-year project which is designed to strengthen management within the Kenyan NARS.

The project is supported by a \$1.12 million grant from the Commission of the European Communities. The first four workshops were held in 1990.

The 1991 workshop series began February 11 with the Workshop on Priority Setting. Most of the senior staff from KARI headquarters attended this five-day event where various methods of priority setting to help reach programming decisions were discussed.

At the Human Resource Development and Management Workshop, from April

*Improving scientific communication: participants in the second KARI/ISNAR Scientific Writing and Presentation Workshop in Thika, Kenya.*



8-12, 35 mid- and senior-level research managers discussed key human resource issues. Among the topics were planning, recruitment, job description preparation, performance evaluation, and training.

During the Review Workshop on Livestock Viral Diseases Research, held from June 24-28, 40 researchers and managers from eight Kenyan research institutes and universities set priorities for livestock research. Improved diagnosis, vaccine development, and epidemiology were among those at the top of the list.

The Scientific Writing and Presentation Workshop, from September 23 to October 4, was designed to improve participants' presentation skills. The event was modeled on one held in 1990. The 15 scientists and research managers in attendance practiced speaking before a group and used video tape feedback and peer review to improve their skills. Participants in this and last year's workshops are now charged with the task of fostering these skills among their colleagues.

At the KARI/ISNAR Workshop on Program Design and Priority Setting at the Program Level, held from October 28 to November 1, organizers used exercises,

discussions, and presentations to introduce the 25 participants to the critical components of a successful research project. Production-constraint analysis and priority setting were emphasized, along with project design and human resources development.

The last workshop of 1991, Agricultural Research Policy in Kenya, from November 25-28, was the first in this series to formally bring together policymakers representing the spectrum of planning, research, higher education, and development. The 40 participants discussed the advantages of closer collaboration on policy issues. KARI, one of the key institutions in research planning and program implementation, had hitherto played a small role in policymaking. Improving links among the various components of Kenya's research system and with the policy-making environment is one of the project's basic goals.

The 1991 events and feedback left ISNAR organizers with a strong sense of progress. They feel the wealth of goodwill and support within Kenya's NARS will act as a springboard for the remaining 15 workshops in the series.

## Nigeria: promoting an integrated national system

Nigeria's national agricultural research system is the largest in sub-Saharan Africa, both in terms of the number of researchers it employs and the scope of the agricultural problems it deals with. ISNAR was therefore pleased to respond to an invitation from Nigeria's Committee of Directors of Research Institutes (CODRI) to jointly organize a workshop for policymakers and agricultural research leaders in the country. CODRI is a voluntary association of research directors which promotes national develop-

ment through the application of research.

The workshop was held at the Agricultural and Rural Management Training Institute (ARMTI) in Ilorin from February 18-22. The Federal Ministry of Science and Technology collaborated with ISNAR and CODRI in organizing the event.

A major aim of the workshop was to foster among Nigerian agricultural research institutes a sense of belonging to a broader national system with integrated goals. The 46 participants included directors of research institutes under the Fed-

eral Ministry of Science and Technology, directors from other national institutes, university lecturers, and ISNAR staff.

Among the 33 workshop recommendations was a request for the formulation of an explicit national policy on agricultural research and mechanisms to ensure adequate and stable funding. Participants suggested that an earlier recommendation to create a national advisory committee on agricultural research also be acted on. Such a committee would periodically review policies and objectives and advise the government accordingly.

Other recommendations called for improvements in communication and human resource management within the NARS, and training in policy formulation, analysis, and implementation for senior and middle management staff.

The workshop was highly participatory and resulted in an excellent exchange of information and views. A proceedings, produced by CODRI with ISNAR assistance, will be used in-country as reference material for agricultural researchers.

## Toward 2010: gazing into the future

A series of "blue sky" discussions was organized by ISNAR from May 23-25, 1991, to help us to formulate our new strategy and medium-term plan by providing insights as to the issues that will emerge in agriculture and agricultural research over the next two decades.

The eight invited experts who took part in this informal consultation were: E.R. de Andrade Alves (Brazil), Pierre Crossan (U.S.A.), M. Yusof bin Hashim (Malaysia), Moise Mensah (Benin), David Norse (U.K.), M.S. Swaminathan (India), Declan Walton (Ireland), and Aart de Zeeuw (The Netherlands).

Among the areas pinpointed by the participants as requiring increased intervention from agricultural research in the coming decades were crop yield enhancement, irrigation, weed control, and weather forecasting. Rural-urban migration will also increasingly affect local agricultural production.

As a conservative estimate, developing countries will need an extra half-billion tons of cereals per year by 2010 to feed their populations. This while environmental stresses multiply and defo-

restation continues to degrade soils. The experts suggested that by 2010 the key constraint to agricultural production in many areas could be water.

The need to boost efficiency and lower production costs will be the constant theme during the coming decades for those involved in agricultural research. As agriculture becomes increasingly science-based, the national systems will remain under pressure to deliver a constant flow of new technologies to improve crop yields. Regional or subregional cooperation could provide a boost for crops that are not subject to export competition. The consulting experts noted, however, that the NARS should remain the basic building blocks of agricultural research. They should be "supported but not substituted" at the regional level. "The most creative role for international organizations (including ISNAR) is to work with the people directly concerned in the the construction of alternative models and approaches in research cooperation."

In conclusion, the consulting experts stressed that the current complacency

over world food problems is dangerous. They said that "any weakening of research effort could sow the seeds for disaster" some time in the future.

A 20-page report of the discussions, titled *Towards 2010: Challenges for Agriculture and Agricultural Research*, is available from ISNAR's Publications Services.

### Consultation in Bangkok: common challenges for Asian research

**D**uring a consultation on agricultural research management in Asia, held in Bangkok from October 17-19, 1991, NARS leaders from the region shared their experiences as managers and discussed future challenges and opportunities for agricultural research. The group also provided valuable feedback on ISNAR's draft strategy for the 1990s and made suggestions on how ISNAR

can enhance its service role in Asia.

Participating in the consultation were research leaders from nine countries — China, India, Pakistan, Sri Lanka, Bangladesh, Indonesia, Malaysia, the Philippines, and Thailand. Six ISNAR staff and a representative of the FAO Regional Office for Asia and Pacific were also in attendance.

During the three-day program,

*Senior research leaders from nine Asian countries met in Bangkok with ISNAR staff in October. They agreed on the need to improve public and political support for agricultural research.*



country reports were presented on many aspects of research management. Strategies for regional collaboration in Asia were discussed, as were emerging problems in agriculture and agricultural research.

The group recognized several common problems, including difficulty in identifying resources and funding. Together, they resolved to seek and share methods of gaining public and political support and of tapping potential sources of funding for agricultural research. They urged ISNAR to assist in this, to continue to facilitate interaction among NARS managers in Asia, and to continue to document successful management experiences from within the Asian NARS.

The participants also suggested that ISNAR support could help to strengthen specific components of research policy and management. Priority setting and planning at both the system and program levels, human resource management, and the development of leadership skills were highlighted as priority areas. ISNAR-organized training would greatly benefit young managers in the Asian research systems since most have had little or no management experience, said the participants. They also recommended that ISNAR identify emerging issues that will affect NARS and produce briefing papers about these subjects to serve as aids to decision makers.

## Two consultations on biotechnology policy issues

**I**n late April ISNAR hosted a two-day informal consultation in The Hague on agricultural biotechnology. It brought together some 20 participants from various international agencies and ISNAR. The main aims of the meeting were to discuss current programs and new initiatives in agricultural biotechnology and to identify opportunities for future collaboration and information exchange.

Several participants made presentations on their biotechnology-related work. Topics included biosafety, intellectual property rights, commodity and country case studies, and biotechnology information and documentation. Here we highlight a few trends and issues related to the first two of these.

*Biosafety.* Numerous initiatives by international organizations and national governments are under way. These concern the establishment of guidelines, procedures, and regulatory mechanisms to

ensure the safe release of genetically modified organisms into the environment. Many countries are now examining ways to set up national biosafety systems and harmonize these with international guidelines. It was stressed that it will be through such national mechanisms, not international ones, that new organisms will actually be released. The key issue in biosafety, according to one speaker, was to advance the application of biotechnology to agriculture without either undue risks or excessive costs (including public mistrust of biotechnology products).

*Intellectual property rights.* Developing-country skepticism over the push to legally protect new processes and genetically altered organisms produced by biotechnology has softened somewhat. Previously, there was widespread apprehension that the introduction of "intellectual property rights" — for example, protection through patents — would in-

hibit the flow of germ plasm (genetic material) needed for research. In biotechnology-related areas there is still little legal protection outside the industrial countries. However, many countries, both industrialized and developing, are now adopting plant breeders' rights. These afford breeders a modest level of protection for new varieties, whether developed through biotechnology or traditional methods. It is clear that any move by developing countries to recognize intellectual property rights should be supported by good advice based on up-to-date information. At the moment, information is not always readily available on how the application of intellectual property rights is affecting or will affect developing countries' access to such protected material. As for the international research centers of the CGIAR, it was suggested that the overriding consideration in patenting or otherwise protecting innovations should be to continue to ensure ready access to new technology by developing countries.

From September 2-4 ISNAR hosted a more formal consultative meeting on biotechnology, attended by some 70 participants. These included representatives of international agencies, international agricultural research centers, national research systems, universities, public- and private-sector institutes involved in biotechnology, and ISNAR.

This international workshop on Biotechnology Policy and the CGIAR was cosponsored by BIOTASK, the CGIAR's biotechnology task force charged with stimulating an international dialogue on biotechnology among donors, NARS, and international research centers. The workshop focused on biosafety and intellectual property policies as they relate to the work of the CGIAR research centers. As with the April consultation, the main aim

of the meeting was to exchange information rather than to formulate policy or make recommendations.

Presentations were made on developments in biosafety regulation at the international, regional, and national levels. The papers referred to initiatives under way within the OECD, the European Community, the Inter-American Institute for Cooperation on Agriculture (IICA), United Nations bodies, Latin American countries, Kenya, the Philippines, and two international research centers. A similar approach was taken for the discussions on intellectual property rights. Presentations covered trends and developments in Latin America, Africa, and India, as well as the experiences of an international agricultural research center, a seed company, and a biotechnology company.

A number of issues and questions on biosafety and intellectual property rights are of special concern to international agricultural research centers (IARCs). Among them:

#### *Biosafety*

- Most IARCs are located in areas where their target crops are economically important. In releasing genetically altered plants, extra care will need to be taken to protect the area's existing crops and other local genetic resources.
- Many IARCs distribute their germ plasm widely through networks. Unsafe practices could have far-reaching effects and must therefore be avoided.
- Because of their international clientele, IARCs must be able to deal with the biosafety requirements of many countries, not just the host country.

- If damage is done by releasing genetically altered organisms, who is liable?
- The CGIAR centers should play a more active role in raising public awareness of biosafety and other issues in biotechnology.
- To what extent could better protection of intellectual property help generate income for the international centers?
- What are the benefits and risks of cooperating with the private sector in industrial countries in order to get access to proprietary biotechnologies?

### *Intellectual Property Management*

- The CGIAR centers have an "open door" policy regarding the availability of their research results. This gives free access to both profit-seeking and non-profit organizations. To what extent can this policy be retained?
- Will measures to protect intellectual property help or hinder efforts to ensure that research results are delivered to farmers in developing countries?

ISNAR believes the September workshop served a valuable function: to expand international understanding of issues in biotechnology, especially as they affect developing countries. As such, it was an important contribution to the on-going CGIAR policy dialogue on the subject. That dialogue, it should be noted, is the conceptual groundwork on which the CGIAR will shortly set policies and guidelines that will influence the behavior of biotechnology-based international R&D in the exciting years ahead.

## **Training events and conferences by region**

*The following section lists 1991 consultations, workshops, seminars, training events, and other major meetings by region. These are events which ISNAR either organized alone, conducted jointly with other organizations, or contributed to by providing resource people. The event description is followed by the date, the location, and the number and types of participants.*

### **Africa**

Workshops of the KARI/ISNAR Agricultural Research Management Linkage Training Project.

Priority Setting in National Agricultural Research Systems. February 11-16. Kenya. 31 senior- and middle-level managers.

Human Resource Development and Management. April 8-12. Kenya. 35 senior- and middle-level managers.

Livestock Viral Diseases. June 24-28. Kenya. 40 policymakers and senior- and middle-level

research managers.

Scientific Writing and Presentation. September 23-October 4. Kenya. 15 middle-level managers and research scientists.

Program Design and Priority Setting at the Program Level. October 28-November 1. Kenya. 25 senior- and middle-level managers.

Agricultural Research Policy in Kenya. November 25-28. Kenya. 40 senior-level managers.

ISNAR/AGIR/CILSS/IDRC Systems Analysis Workshop. January 28-February 1. Niger. 52 policymakers and middle-level managers.

CODRI/ISNAR Workshop on Agricultural Research Management. February 18-22. Nigeria. 46 policymakers and senior-level managers.

ISNAR/AGIR/CILSS/IDRC Workshop on Challenges Facing the Senegalese Agricultural Research Institute (ISRA). February 18-22. Senegal. 32 senior- and middle-level managers.

National Workshop on Developing a Framework for NARS Planning (SACCAR). February 25-March 7. Zimbabwe. 30 senior- and middle-level managers.

Sub-Regional Workshop for Preparation of a Framework for Research Planning (Botswana, Lesotho, Swaziland). May 6-10. Swaziland. 30 senior-level managers.

Windhoek Regional Workshop on Research Policy. November 18-20. Namibia. 27 policymakers and senior-level managers.

## Asia

Workshop on Strategic Planning for Small-Country NARS in the South Pacific. March 4-8. Western Samoa. 23 senior-level managers.

Management Information Systems Workshop. March 8-9. Indonesia. 53 senior- and middle-level managers.

Dissemination Workshop for AARD/ISNAR Research Priorities Project. July 25. Indonesia. 30

policymakers and senior-level managers.

Strategic Planning Workshop. September 10-13. China. 25 policymakers and senior- and middle-level managers.

Consultation on Agricultural Research Management in Asia: Future Strategy. October 7-9. Thailand. 20 senior-level managers.

## Latin America

Agricultural Research and Technology Transfer in Costa Rica: Present and Future. October 28-30.

Costa Rica. 75 senior-level managers.

## West Asia and North Africa

INRA/Office de Mise en Valeur de Ouarzazate/ISNAR Method for Developing Research Projects Applied to the Date-palm Program. February 25-27. Morocco. 35 middle-level managers.

Hassan II/INRA/ISNAR Method for Long-Term Programming. March 1. Morocco. 35 middle-level managers.

INRA: Research/Development Links and the Role of INRA's Research and Development Units.

April 25-26. Morocco. 70 senior- and middle-level managers.

INFORM Introductory Workshop. April 27. Egypt. 20 senior-level managers.

Workshop on Priority Setting for Leguminous Crops. September 16-17. Morocco. 25 senior-level managers.

## Global

ICRA Course: Logical Framework and OFCOR. February 20. The Netherlands. 18 researchers, mostly from Africa.

Informal Consultation on Agricultural Biotechnology. April 22-23. The Netherlands. 20 policymakers and senior-level managers.

Synthesis Meeting: Research-Technology Transfer Linkages Project. May 6-10. The Netherlands. 18 researchers and advisors to ISNAR's RTTL project.

Informal Consultation — Towards 2010: Challenges for Agriculture and Agricultural Research. May 23-25. The Netherlands. 8 invited inter-

national experts, 8 senior ISNAR staff.

ICRA Course: Program Design and Priority Setting. May 30-31. France. 15 researchers, mostly from Africa.

BIOTASK/ISNAR Seminar on Biotechnology Policy and the CGIAR. September 2-4. The Netherlands. 70 policymakers and senior-level managers.

CG Senior Managers' Gender Workshop. November 1-2. U.S.A. 25 senior-level managers.

Definition of Research Priorities (FAO/CIRAD). November 7-8. France. 21 senior- and middle-level managers.

*In addition to the above events, ISNAR also hosted meetings of several other international bodies including the Technical Advisory Committee of the CGIAR, the International Center for Living Aquatic Resources Management, the International Fertilizer Development Center, the International Irrigation Management Institute, and the International Crops Research Institute for the Semi-Arid Tropics.*

## IV. Information and Administration

### Library and Documentation Center

The library serves mainly ISNAR staff, consultants, and the Dutch scientific and development communities. It also responds to external requests from national research institutes, donor agencies, and other agencies around the world.

The year was particularly busy, for in addition to delivering information services to staff, the library was involved in a number of other activities. In September, the librarian of the Institute of Agricultural Research at Ahmadu Bello University in Nigeria came to ISNAR on a six-month sabbatical leave. His visit came at a time when staff were beginning to

transfer the library's data base of some 16,000 records from the existing Wang minicomputer to a microcomputer system using CDS/ISIS, a program developed by IDRC. The transfer has given the library greater flexibility in the use of its data bases and allows it to provide a greater variety of information products. The introduction of standardized software that is also used by many NARS information units is expected to strengthen the possibilities for information exchange.

During the past year, the library also was closely involved in ISNAR's study of agricultural research in small countries. See page 39.

### Publications Unit

Despite major changes in staffing, the editing and production team produced 27 official ISNAR publications (see page 63) and nine documents for other organizations. In addition, the unit contributed to the preparation of numerous internal documents, including background papers for the External Review, the External Review report itself, and the first drafts of the ISNAR strategy.

A milestone for ISNAR was the publication of *Agricultural Research Policy: International Agricultural Perspectives*. (See page 42.) The manuscript of this major volume was edited and designed in-house and

printed by Cambridge University Press. Staff of the Publications Unit also researched, wrote, and designed the annual report and produced three issues of the *ISNAR Newsletter*.

In April, a consultant was engaged for a week to review ISNAR's publishing policies and procedures. Implementation of many of the recommendations, along with those from the External Review, has begun. Major changes are planned for 1992.

The mailing list grew a little less than five percent in 1991, to about 4375 records.

### Computer Services

ISNAR made its largest ever annual investment in computing resources during 1991. This marked a decisive

change in the institute's computer operations, away from a combination of centralized and standalone computing, to

decentralized, networked computing. Most of the investment went toward equipping our staff with personal computers (PCs).

The Computer Services unit, formally created following the External Program Review, had two major simultaneous tasks during the year. One was the expansion of our institutional PC network. The other was the gradual phasing out of a five-year-old WANG system, along with the replacement of its software applications and the conversion of data stored on it.

The VAX-based PC network, commissioned in mid-1990, and the WANG system began the year with 20% and 80% of ISNAR desks respectively. By year end, the positions had been reversed — a terminal decline for the WANG, literally.

The technological transition in the office was paralleled by the growing use of

compatible computers in staff members' homes, as well as "on the road", during missions to collaborating countries. Almost half of ISNAR's professional staff are now equipped at home with PCs rented from ISNAR.

The computer-mediated changes in our work habits should amount to more than mere convenience — such as being able to prepare camera-ready copy in-house based on material sent by email from remotely located staff (as happened with the very text you are reading). It will also result in cost savings as well as better looking documents produced more quickly. Perhaps even more important in the long run, our own institutional development experience in the area of information technology should now be more directly relevant to the NARS and will inform much of our work with them.

## Administrative Services

**O**n the personnel administration side, ISNAR's staff regulations, including conditions of employment, were rewritten to meet current legal and human resources management requirements. The Board of Trustees approved the new regulations in September. The institute's salary scales both for staff paid in local currency and for those paid in US dollars were updated and a system of annual step increases was introduced. Before adjusting local-currency salary scales, ISNAR conducted a salary and benefits survey with the assistance of our external auditors.

We also introduced an orientation program for new staff and hired a full-time person to operate a lunchtime catering service for all staff. The food service has not only reduced the high cost of using an outside contractor but also increased our

flexibility in providing service to participants in the many meetings and workshops held at ISNAR.

On the financial side, Administrative Services introduced a new software package to operate ISNAR's accounting system. Training of staff and implementation of various components of the new system began in April.

During the year, ISNAR also began a series of internal audits. The Publications Unit and Travel Services were the first two units within ISNAR to undergo financial and operational reviews.

Finally, the staff of Administrative Services also contributed to preparations for the External Review by compiling background information, mostly statistical, on ISNAR activities over the last five years.

## V. Internal Analysis and External Review

*In June and July, an international panel commissioned by the Technical Advisory Committee (TAC) of the CGIAR conducted an External Review of ISNAR's program and management. Its report, highly complimentary of ISNAR's work, covered the period 1986-90.*

*To prepare for this, ISNAR was asked to analyze its achievements, impact, and constraints on its work over the previous five years. We responded by preparing two retrospective papers. The first examines our collaboration with national agricultural research systems. The second analyzes our R&D efforts related to major themes, or critical factors, in research policy, organization, and management. We also drafted a number of companion background papers on specific subjects. In one way or another, the vast majority of ISNAR staff contributed to this important exercise in institutional "soul searching".*

*In this section we present some of the lessons learned from the self-evaluation, briefly describe the process of the External Review itself, and highlight some of the review panel's 18 recommendations.*

### Collaboration with NARS: achievements and lessons

**I**t is notoriously hard for an institution like ISNAR, whose staple outputs are advice and assistance to others, to demonstrate exactly what impact its actions have had. First, there is no generally accepted approach to assessing institutional development, partly because it is a long, complex process. Actions taken today may bear fruit only after a decade or more. Second, in the presence of strong political and socioeconomic forces, success or failure may lie outside the province of ISNAR or even of the partner it sought to help. Finally, in the presence of contributions by other much larger organizations, it is difficult to distinguish which improvements resulted from our

specific efforts.

With these severe limitations in mind, we nonetheless tried to gauge the results of our work with NARS and to draw lessons that may be useful for the future. This initial self-analysis, covering our work in 46 countries, was based on a survey of ISNAR country officers. Though their assessments are somewhat subjective, they do reflect the professional experience of those at ISNAR who best understand the inner workings of NARS. Here are some of the more important findings:

- In about 60% of the countries covered by the survey, research policies have been clarified and linked more closely

- with national development policies — a major aim of ISNAR. New laws to improve agricultural research management have been passed in more than half. However, ISNAR needs to collect more information in this area and to continue to document ways to improve the legislative and policy environment affecting NARS.
- Political support for NARS and their work has increased in nearly 70% of the countries ISNAR works with. However, this has seldom translated into greater levels or stability of domestic funding (i.e., from government coffers). Funding stability is estimated to have been positively affected in only about 20% of the countries covered by the survey. Outside donors' financial support for agricultural research projects, though, has increased in more than half the countries.
  - Donor-funded research projects have become better focused on national priorities in nearly half the countries. All the same, ISNAR's country officers believe that weak coordination of donor support with developing-country governments' own efforts is still a serious problem.
  - Once the needed changes in research policy, organization, and management have been identified, it's best to introduce them step by step. Too much change all at once can seriously disrupt work within a NARS. New research planning and management schemes should be simple, practical, and affordable.
  - Strong participation of NARS managers and their staff, with ISNAR acting as a "facilitator", is essential for successful planning, acceptance, and implementation of change.
  - The survey indicates that more progress has been made in research planning than in any other area of ISNAR's work. Improvements in medium- or long-term planning are reported in 80% of the countries. Improvements in priority setting at the national level or within programs have been made in about half.
  - Major organizational changes, such as restructuring the whole research system or consolidating existing research institutes, have been put in place in over 40% of the countries with which ISNAR has worked. Internal organization has improved in nearly 60% of our client NARS.
  - Links between research and technology transfer agencies have been improved in nearly half the countries. On-farm research has improved in nearly 40%. ISNAR country officers believe these trends reflect NARS' growing concern that technologies should be more appropriate to farmers' needs.
  - Interaction and coordination among research institutes that form a NARS have improved in more than one-third of countries, and linkages with universities in more than 40%.
  - Program formulation and budgeting is now better in more than half the countries. However, in two important areas — information management and monitoring and evaluation of research — relatively little improvement has been made to date.
  - Experience points to the value of beginning with strategic planning and following through with systematic program formulation to ensure that broad program objectives are reflected in individual research experiments.
  - Management of human resources has

improved in about 60% of the countries. Physical and financial resources are another matter. Improvements in the management of the former were re-

ported for about 25% of the countries; and in the management of the latter, only about 15%.

## ISNAR as a research-based service: lessons for the future

ISNAR's second exercise in readying itself for the 1991 External Review was to analyze its efforts over the previous five years to build a knowledge base on the major themes covered by its mandate. These themes, or "critical factors" as they are often referred to within ISNAR, can be classified under three headings: the policy context of agricultural research, the structure and organization of research, and the management of research programs and resources. (See page 9.)

Improving understanding in these areas is a task that cuts across ISNAR's advisory, research, and training programs. However, the job of synthesizing ISNAR experience and generating new knowledge and tools falls largely to ISNAR's research program. This work has expanded and matured since 1985 when our last External Review recommended we give it greater emphasis.

Among the lessons learned from our experience in thematic research and development, we highlight the following:

- Involving national research managers directly in the development of management concepts, processes, tools, and methods ensures that these products are relevant. More important, it increases their chances of their being adopted by NARS.
- During the early stages of thematic R&D at ISNAR, we believed we could develop standard tools and processes applicable across a range of national systems. However, NARS at different

stages of development clearly have different needs. Experience shows that ISNAR's products always need some adaptation to local needs.

- Management tools and processes need to be developed and used together. For example, in the area of strategic planning, an improved tool for setting research priorities is not much good unless a suitable process for collecting basic commodity data is also in place.
- ISNAR needs to strengthen and diversify its network of research partners. It is a small organization and cannot be expert in everything. So we have to forge alliances with other institutions and individuals who have the know-how we lack. Together with expertise available in the NARS themselves, these collaborators form a kind of "invisible college" for ISNAR to tap.
- The people who shape a national agricultural research system often stand outside it. Senior decision makers and the broader development community should be given more emphasis as clients of ISNAR's knowledge and information on institutional development.
- As the funding situation tightens in many NARS, increased efficiency in the use of existing resources becomes crucial. At the same time NARS will have to cooperate more closely with the private sector and other nongovernmental entities to conduct research. ISNAR

needs to study these issues more closely in order to help NARS cope with inevitable change.

- ISNAR and its partners in management research should do a better job of monitoring and evaluating the outcome of planned changes in national systems. Assessing impact jointly with the NARS will reinforce national capacity in this

important area of management and will provide useful feedback to ISNAR.

- International meetings are a useful tool in the development of ISNAR's themes. They serve both as a testing ground for new tools and training materials, as a means of synthesizing experience, and as a catalyst, speeding up work on specific themes.

## A vote of confidence in ISNAR

The retrospective analyses described above provided the External Review panel with a wealth of background information on ISNAR's last five years. The real litmus test of ISNAR's performance, however, was the direct feedback the panel received from ISNAR's partners — the national research systems that we serve.

At the beginning of the review, in June, the eight members of the panel split up into small groups and visited seven of ISNAR's partner countries: Costa Rica, Ghana, Indonesia, Mali, Sri Lanka, Tanzania, and Uruguay. There, they interviewed senior research leaders, scientists, and government officials. The entire panel also visited an eighth country, Kenya.

To complement these face-to-face discussions, the panel also surveyed a large number of national systems by mail, asking them to evaluate their collaboration with ISNAR. After the field visits, the panel assembled for three full weeks at ISNAR headquarters to examine the background analyses prepared by ISNAR, to interview staff members, and to prepare its final report.

"The basic, predominant assessment is very, very positive," said the panel chairman, Professor John Lewis of Princeton

University, in addressing ISNAR management and staff on the last day of the review. ISNAR should feel confident now, he said, to go ahead and take a "center-stage role in the CGIAR."

The panel made 18 recommendations. ISNAR has endorsed the vast majority and is moving ahead quickly to implement them. We highlight here a few of the recommendations that touch specifically on ISNAR's institutional capacity to serve our NARS partners:

- ISNAR should develop a more effective scheme for setting its priorities among countries and regions according to the stage of development and needs and opportunities of the different NARS.
- ISNAR should direct some of its research effort to the study of agricultural research management in some of the larger or more technically sophisticated NARS.
- ISNAR should more systematically address the important role of universities and schools of agriculture in developing-country NARS.
- ISNAR should actively pursue a training strategy that emphasizes a multiplier effect. It should do this by developing training packages that can

## Members of the External Review Panel

**Chairperson: Dr. John P. Lewis, consultant and Professor of Economics and International Affairs, Princeton University, U.S.A.**

**Dr. Eric Craswell, Agricultural Research Officer (resource management), CGIAR Technical Advisory Committee (TAC), Rome, Italy.**

**Ms. Elizabeth Field, Management Specialist, CGIAR Secretariat, Washington, D.C., U.S.A.**

**Dr. Edgardo Moscardi, Director General, Instituto Nacional de Tecnología Agropecuaria, Argentina.**

**Dr. Bakary V. Ouayogode, Director of Research Programs and Training, Ministry of Education, Scientific Research and Cultural Affairs, Côte d'Ivoire.**

**Mr. Chavalay Srinivasa Sastry, consultant and formerly Permanent Secretary and Coordinating Secretary for the four departments of India's Ministry of Agriculture.**

**Dr. Burton Eugene Swanson, Professor and Associate Director, Office of International Agriculture, University of Illinois, U.S.A.**

**Dr. Tilo L.V. Ulbricht, consultant and formerly Senior Scientific Adviser, Agricultural Research Council (ARC), U.K.**

*Members of the External Review panel put the finishing touches on their report at ISNAR headquarters. Left to right: Ulbricht, Swanson, Sastry, and Lewis.*



be used by intermediary institutions or by trainers in a region who can then begin to provide the direct training needed by middle-level NARS managers.

- The CGIAR, recognizing the central role of ISNAR in institution building, should increase its core funding by at least \$2 million in 1993 with some continuing growth thereafter.

In its comments on the External Review report, TAC noted: "In the view of the Panel, ISNAR emerges from the Review as a strong and credible organization with a big task ahead of it.... TAC generally endorses both the formal recommendations and the other numerous suggestions.

TAC believes that if these are acted upon, ISNAR is well placed to improve its performance."

For ISNAR, the External Review exercise served the very useful purpose of helping us to review critically our achievements and shortcomings and to guide our work for the rest of the decade. Clearly, we are now better prepared to assist the NARS in meeting the growing demands that will be placed on them. ISNAR hopes donors will agree to give us the recommended funding increase we need to continue — and to improve — our work of assisting countries in building sustainable research institutions and systems of agricultural research.

## ISNAR Publications — 1991

### Publications about ISNAR

Annual Report 1990. March 1991.

Rapport annuel 1990. Novembre 1991.

Informe Anual 1990. Noviembre 1991.

Catalog of Publications 1991. November 1991.

ISNAR Newsletter, No. 16. May 1991.

ISNAR Newsletter, No. 17. August 1991.

ISNAR Newsletter, No. 18. December 1991. Includes 6-page insert: NARS in a New Age: ISNAR's Centers Week Presentation. By C. Bonte-Friedheim. October 1991.

### Book

*Agricultural Research Policy: International Quantitative Perspectives*. Edited by Philip Pardey, Johannes Roseboom, and Jock R. Anderson. Published for ISNAR by Cambridge University Press. July 1991.

1. Economic Policy and Investment in Rural Public Goods: A Political Economy Perspective (*T.L. Roe and P.G. Pardey*).
2. Agricultural Research in an International Policy Context (*G.E. Schuh and G.W. Norton*).
3. Sustainability: Concepts and Implications for Agricultural Research Policy (*T. Graham-Tomasi*).
4. Agricultural Research in a Variable and Unpredictable World (*J.R. Anderson*).
5. Internationally Comparable Growth, Development, and Research Measures (*B.J. Craig, P.G. Pardey, and J. Roseboom*).
6. Patterns of Agricultural Growth and Economic Development (*B.J. Craig, P.G. Pardey, and J. Roseboom*).
7. Regional Perspectives on National Agricultural Research (*P.G. Pardey, J. Roseboom, and J.R. Anderson*).
8. Topical Perspectives on National Agricultural Research (*P.G. Pardey, J. Roseboom, and J.R. Anderson*).
9. International Agricultural Research (*G. Gryseels and J.R. Anderson*).
10. Private-Sector Agricultural Research in Less-Developed Countries (*C.E. Pray and R.G. Echeverría*).
11. Impact of Research and Seed Trade on Maize Productivity (*R.G. Echeverría*).
12. Challenges to Agricultural Research in the 21st Century (*V.W. Ruttan*).

### Reports of Meetings

Management Information for National Agricultural Research Systems in Asia. Proceedings. INFORM Series. June 1991.

Towards 2010: Challenges for Agriculture and Agricultural Research. Conclusions of an informal consultation organized by the International Service for National Agricultural Research, The Hague, May 23-25, 1991. Published October 1991.

Highlights of a consultation on monitoring and evaluation of agricultural research, The Hague, November 12-14, 1990. Published October 1991.

### Special Report

Towards a new agricultural revolution: Research, Technology Transfer, and Application for Food Security in Sub-Saharan Africa. IFPRI/ISNAR. October 1991.

### Working Papers

No. 37. An Approach to Long-Term Program Design, including priority setting and human resource allocation. By Marie-Hélène Collion and Ali Kissi. January 1991.

No. 38. Organization and Structure of National Agricultural Research Systems in Anglophone sub-Saharan Africa. By T. Ajibola Taylor. January 1991.

Nº 37E. « Une démarche de conception d'un programme à long terme ». Par Marie-Hélène Collion et Ali Kissi. Juillet 1991.

Nº 39. « Planification de la recherche Agricole : Le Cas de Madagascar ». Par Clet Pascal Ravohitrarivo. Juillet 1991.

No. 40. National Agricultural Research from a Regional and Agroecological Perspective. By Philip G. Pardey and Johannes Roseboom. August 1991.

No. 36s. Problemas y Soluciones para "Descentralizar" los Sistemas Nacionales de Investigación Agropecuaria. Por S. Huntington Hobbs. Octubre 1991.

### Small-Countries Series

No. 1. The Scale and Scope of National Agricultural Research in Small Developing Countries: Concepts and Methodology. By Pablo Eyzaguirre. March 1991.

No. 2. Managing the Flow of Scientific Information for Agricultural Research in Small Countries: An Issues Paper. By Peter Ballantyne. November 1991.

No. 3. Managing Scientific Information to Meet the

Changing Needs of Agricultural Research in Trinidad and Tobago. By Maritza Hee Houng and Peter Ballantyne. December 1991.

### **Inform Series — Guidelines**

No. 1. An Overview of INFORM, an Information Management System. By Barry Nestel. June 1991.

No. 2. Methods and Procedures for the Development of INFORM. By Govert Gijsbers. June 1991.

No. 3. Revenue and Cost Codes for Use with INFORM. By Barry Nestel. June 1991.

No. 4. A Minithesaurus of Keywords for Use with INFORM. By Barry Nestel. June 1991.

### **On-Farm Client-Oriented Research (OFCOR) Series**

Discussion Paper No. 2. A New Model for Technology Transfer in Guatemala: Closing the Gap between Research and Extension. By Ramiro Ortiz, Sergio Ruano, Horacio Juárez, Francisco Olivet, and Adlai Meneses. February 1991.

### **Country Report**

R52. Review of the Ghana Agricultural Research System. Volumes I and II. CSIR and ISNAR. July 1991 (first printed in December 1989 for limited circulation).

### **Internal Documents Prepared for the External Review**

ISNAR Collaboration with National Agricultural Research Systems: Achievements, Impacts and Constraints.

Thematic Development at ISNAR: Achievements, Constraints and Lessons, 1986-1990. Annex: ISNAR Research Program, 1986-1990.

Institutional Development in NARS: Illustrative Cases. Edited by Warren Peterson.

Recent Improvements in NARS: Results of a Survey of Country Officers. By Douglas Horton, Rudolf Contant, Beatriz Uribe, Warren Peterson, and H. Krishan Jain.

Recent Improvements in NARS: Country Summaries. By Rudolf Contant.

ISNAR Diagnostic Reviews: An Analysis of Recommendations. By Jaap Reijmerinck and Beatriz Uribe.

Collaboration with NARS in Planning: A Review of ISNAR's Experience. By M.-H. Collion.

Training at ISNAR. By Paul Marcotte and Robert Raab.

Key Elements of ISNAR's Revised Strategy.

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Bojanić, A. and R.G. Echeverría. 1991. Retornos a la inversión en investigación: El caso de la soya (1e parte). *ProCampo*. (Febrero): 35-41.

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Bonte-Friedheim, C.H. 1991. The benefits of agricultural research in European Community and developing countries. In: *Agricultural and food research: Who benefits?* edited by Wise, T.E. Reading, UK: Centre for Agricultural Strategy (CAS Paper 23): 66-80.

Dagg, M. 1991. Planning and priority setting: Tools and processes. In: *Proceedings of a CODRI/ISNAR International Workshop on Agricultural Research Management, Ilorin, Nigeria, 18-21 February 1991*. The Hague, The Netherlands: 49-63.

Elliott, H. 1991. National agricultural research systems in developing countries: A report on progress. In: *Proceedings of a CODRI/ISNAR International Workshop on Agricultural Research Management, Ilorin, Nigeria, 18-21 February 1991*. The Hague, The Netherlands: 1-9.

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Fan, S. and V.W. Ruttan. 1991. Induced technical change in centrally planned economies. St. Paul, MN: University of Minnesota, Economic Development Center. *EDC Bulletin*. 91-3.

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## Consultants to ISNAR — 1991

Name, Affiliation, Location	Nature of Consultancy
Tonyawo M. Aithnard Ministère du Développement Rural Lomé, Togo	carried out a country case study on Togo for the Small-Countries Project
Erdogan F. Akyüz Independent consultant Rome, Italy	reviewed and made recommendations on the structure and organization of ISNAR's administrative, library, and computer services
Julian Alston Univ. of California Davis California, USA	assisted in the preparation of a manuscript on research evaluation and priority setting
E. R. Andrade de Alves Empresa Brasileira de Pesquisa Agropecuaria (EMPBRAPA) Brazilia, Brazil	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Paul Auriol Independent consultant Rome, Italy	collected materials for a study on the resources used in livestock research programs
Célestin P. Bélem Institut d'Etudes et de Recherches Agricoles (INERA) Ouagadougou, Burkina Faso	participated in two expert consultations: one on monitoring and evaluation, the other on organization and structure of research; was a resource person at the AGIR/ISNAR/IDRC management workshop in Niger
Emiliana Bernardo University of the Philippines Manila, Philippines	participated in a meeting at ISNAR headquarters in connection with the Research-Technology Transfer Linkages Project
Adriaan M. Burger Independent auditor Veenendaal, The Netherlands	conducted an internal audit of ISNAR's publishing operations
Hugh Bunting University of Reading Reading, United Kingdom	prepared a document on the organization and structure of agricultural research in Anglophone Africa
Gerry Cambier Consultative Group Language Systems (CGLS) Brussels, Belgium	edited documents written in preparation for the Strategic Plan for agricultural research in Mali
Thomas Chacho Independent consultant Rome, Italy	reviewed the second draft of ISNAR's staff regulations
Simon Chater Freelance editor Exeter, United Kingdom	edited the ISNAR strategy document
Chris Chetsanga University of Zimbabwe Harare, Zimbabwe	carried out a country study on opportunities and constraints in biotechnology in Zimbabwe; participated in a biotechnology seminar organized by BIOTASK and ISNAR in The Hague

Moussa Kola Cissé Centre Africain d'Études Supérieures en Gestion (CESAG) Dakar, Senegal	served as resource person in the AGIR/ISNAR/IDRC management workshop held in Niger
Donald C. M. Corbett Independent consultant Redbourn, Herts., United Kingdom	produced a paper on financial resources; participated in a mission to Rwanda to assist researchers with improvements to their program proposals
Louise Côté Freelance editor Zürich, Switzerland	edited a manuscript on linkages between research and technology transfer, plus a report on the NARS of Hungary
John Coulter Independent consultant Mayfield, East Sussex, United Kingdom	co-authored a paper on important institution-building factors in NARS; participated in the diagnostic review of agricultural research in Hungary
Pierre Crasson Resources for the Future Washington, D.C., USA	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Mohammed Dahniya Institute of Agricultural Research Freetown, Sierra Leone	carried out a country case study on Sierra Leone for the Small-Countries Project
Peter Dart University of Queensland Brisbane, Australia	carried out a country study on opportunities and constraints in biotechnology in Indonesia; participated in a biotechnology seminar organized by BIOTASK and ISNAR in The Hague
Horst Dequin Independent consultant Westerhorn, Germany	worked in consultation with the Uganda Working Group 9A and relevant ministries to develop and update inputs into Volume II of the Uganda Agricultural Research Strategy and Plan
Caas Eerkens The Netherlands Ministry of Agriculture Wageningen, The Netherlands	participated in the diagnostic review of agricultural research in Hungary
Johnson Ekpere Uyole Agricultural Centre Uyole, Tanzania	participated in a meeting at ISNAR headquarters in connection with the Research-Technology Transfer Linkages Project
Robert Ellinger Independent consultant Drysdale, Australia	participated in a team effort to prepare the National Agricultural and Livestock Research Masterplan for Tanzania
Paul Engel Wageningen Agricultural University Wageningen, The Netherlands	participated in a meeting at ISNAR headquarters in connection with the Research-Technology Transfer Linkages Project
Robert W. Etheredge Independent consultant Reston, Virginia, USA	visited research centers and stations in Latin America, Asia, Europe, and North Africa in preparation for drafting guidelines on the design, planning, and maintenance of agricultural research buildings
William K. Gamble Independent consultant Brainerd, Minnesota, USA	collaborated with the Department of Agricultural Research of Malawi to provide assistance in preparation of a research master plan

Elon Gilbert Independent consultant Serrekunde, The Gambia	participated in the preparation of the Uganda Agricultural Research Strategy and Plan; carried out a study on the cost of on-farm client-oriented research; carried out a regional study on West Africa for the Small-Countries Project
Ayele-Mawuto Gninofou Ministère du Développement Rural Lomé, Togo	carried out a country case study on Togo for the Small-Countries Project
Arthur A. Goldsmith University of Massachusetts Boston, USA	produced a paper entitled "Institutional development for agricultural research: Concepts, models and measures"
Mohamed Yusof bin Hashim Malaysian Agricultural Research and Development Institute (MARDI) Kuala Lumpur, Malaysia	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Maritza Hee Houng Ministry of Agriculture, Land & Marine Resources Centeno, Trinidad and Tobago	carried out a case study on: the management of scientific information in Trinidad and Tobago
Pamela van den Heuvel International Development Program of Australia Canberra, Australia	was responsible for the preparation and secretariat of a biotechnology seminar organized by BIOTASK and ISNAR in The Hague
Alexander von Hildebrand Institute of Social Studies (ISS) The Hague, The Netherlands	carried out a study on the costs of livestock research programs
Jurgen E. Huhn Independent consultant Berlin, Germany	participated in a mission to Rwanda to assist researchers with improvements to their program proposals
Lee Ann Jackson Yale University New Haven, Connecticut, USA	carried out background research on incorporating forestry and agroforestry research in NARS
Beth Johnson-Kat Independent consultant Amsterdam, The Netherlands	collaborated on the ISNAR strategy document
Qian Keming Chinese Academy of Agricultural Sciences Beijing, China	prepared a project proposal on priority setting in China
Robert K. Kern Independent consultant Communications for Agriculture World-wide Ames, Iowa, USA	served as trainer at a KARI/ISNAR workshop on scientific writing, in Nairobi, Kenya
John Komen University of Amsterdam Amsterdam, The Netherlands	carried out research as part of ISNAR's biotechnology country studies
La Gro Advocaten Legal Council and Tax Specialists Woerden, The Netherlands	provided a variety of legal opinions in the areas of international public law, social security regulations, and international and local tax issues

Robert K. Lindner University of Western Australia Perth, Australia	carried out a study on the rates of return to research in Indonesia
Idefonse Lupanga Botswana Agricultural College Gaborone, Botswana	participated in a meeting at ISNAR headquarters in connection with the Research-Technology Transfer Linkages Project
Violet M. Malone University of Illinois, UIUC Urbana, Illinois, USA	gave a seminar on workshop management for ISNAR staff
Ibrahim Manwan Central Research Institute for Food Crops Bogor, Indonesia	carried out a country study on opportunities and constraints in biotechnology in Indonesia; participated in a biotechnology seminar organized by BIOTASK and ISNAR in The Hague
Theo Marien Independent consultant Capri, Italy	participated in an internal audit of ISNAR's business travel operations
Jagadish Manrakhan University of Mauritius Réduit, Mauritius	carried out a case study on Mauritius for the Small-Countries Project
Makana Mavuso University of Swaziland Kwaluseni, Swaziland	carried out a case study on the management of scientific information in Swaziland
Alex Mend Ministry of Agriculture and Fisheries Victoria, Seychelles	carried out a case study on the management of scientific information in the Seychelles
Moïse Mensah International Fund for Agricultural Development Rome, Italy	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Ian Montagnes University of Toronto Press Toronto, Canada	reviewed ISNAR publishing policies and procedures and drafted a report with recommendations
Amir Muhammed Asianics Agro-Dev International Islamabad, Pakistan	prepared a paper on TAC's perspectives on agricultural research management in Asia for the consultation in Bangkok; attended the consultation as a resource person
Trower Namane Ministry of Agriculture Maseru, Lesotho	carried out a country case study on Lesotho for the Small-Countries Project
Rosemay Ng Kee Kwong Mauritius Sugar Industry Research Institute Réduit, Mauritius	carried out a case study on the management of scientific information in Mauritius
Fred E. Nichols Consulting economist Kansas City, Kansas, USA	participated in a team effort to prepare the National Agricultural and Livestock Research Masterplan for Tanzania

David Norse UN Food and Agriculture Organization (FAO) Rome, Italy	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Norah Olembo University of Nairobi Nairobi, Kenya	carried out a country study on opportunities and constraints in biotechnology in Kenya; participated in a biotechnology seminar organized by BIOTASK and ISNAR in The Hague
Viviana Palmieri Independent consultant Montes de Oca, Costa Rica	participated in a meeting at ISNAR headquarters in connection with the Research-Technology Transfer Linkages Project
Samsundar Parasram Caribbean Agricultural Research and Development Institute (CARDI) St Augustine, Trinidad and Tobago	carried out a regional study on the Caribbean for the Small-Countries Project
Jagoda Paukovic Institute of Social Studies (ISS) The Hague, The Netherlands	prepared a summary of the various ISNAR-supported research plans, as a background document for the External Program Review
Kham Pham Independent consultant (after being ISNAR staff member) Houston, Texas, USA	prepared a review of ISNAR activities in Cameroon
Hugh Quigley Freelance writer The Hague, The Netherlands	prepared a summary of the ISNAR book <i>Agricultural Research Policy</i>
Anu R. Rao Princeton University Merion, Pennsylvania, USA	co-authored a paper on "Issues of professional women in agricultural research in developing countries"; gave a seminar on the topic; compiled a bibliography and provided reference documents on gender-related staffing issues
Jaap Reijmerink Independent consultant Amsterdam, The Netherlands	prepared an analysis of ISNAR country reviews to date as a background paper for the External Review
Walter G. Rockwood Freelance editor-writer Chelsea, Vermont, USA	prepared INFORM guidelines and training materials
Miguel Rojas Rodrigues Institute of Social Studies (ISS) The Hague, The Netherlands	carried out a review of ISNAR library materials on Mexico, Brazil, Colombia, and Chile in support of a project on agricultural research in Latin America
Paramjit Sachdeva World Bank Washington, D.C., USA	wrote the ISNAR response to 1985 External Management Review in preparation for the 1991 External Review
Olga Salazar Jaramillo London School of Economics London, United Kingdom	assisted with statistical and clerical work during the External Review of ISNAR
Jonathan Sands Independent consultant Orford, New Hampshire, USA	prepared the first draft of a working paper on the collaboration between ISNAR and INRA, Morocco, to develop a project management and budgeting system for agricultural research in Morocco

Tatiana Sikoska Institute of Social Studies (ISS) The Hague, The Netherlands	conducted a literature review on private companies that fund or conduct agricultural research in sub-Saharan Africa, for the public/private sector project
Param Sivan University of the South Pacific Apia, Western Samoa	carried out a country case study on Fiji for the Small-Countries Project
David Smith Independent consultant Melbourne, Australia	produced a paper entitled "Joint government-producers funding of agricultural R&D: The Australian scheme and its lessons"
Petra Smits University of Amsterdam Amsterdam, The Netherlands	carried out an analysis of the data drawn from ISNAR's biotechnology country studies
Boris Sperling Coverdale Munich, Germany	produced a review paper on the ISNAR training program in preparation for the External Review
M. S. Swaminathan Centre for Sustainable Agriculture and Rural Development Madras, India	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Colin Thirtle University of Reading Reading, United Kingdom	co-authored a paper on the roles of the public and private sectors in agricultural research in sub-Saharan Africa
Ricardo Torres Colciencias Bogotá, Colombia	prepared a country study on opportunities and constraints in biotechnology in Colombia; participated in a biotechnology seminar organized by BIOTASK and ISNAR in The Hague
Alexis Vazques Independent consultant San José, Costa Rica	assisted with preparations for the External Review panel's visit to Costa Rica
Declan Walton Independent Consultant Florence, Italy	participated in an informal consultation "Towards 2010: Challenges for Agriculture and Agricultural Research" at ISNAR headquarters
Stanley Wood P.T. Intersys Kelola Maju Bogor, Indonesia	assisted with the study of agroecological aspects of the priority-setting project in Indonesia
Carlos Zacarias United Nations Commission on Trade and Development (UNCTAD) Tegucigalpa, Honduras	produced a study on export diversification in Honduras for the Small-Countries Project
Fang Zhou Independent Consultant Rotterdam, The Netherlands	prepared training materials for a research management workshop held in China

ISNAR Staff 1991



## ISNAR Staff — 1991

### PRINCIPAL AND ASSOCIATE STAFF

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- Howard Elliott**, Deputy Director General,  
Research and Training
- H.K. Jain**, Deputy Director General,  
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Administrative Officer
- Luka Abe**, Senior Research Officer, Training
- Peter Ballantyne**, Librarian
- N'Guetta Bosso**, Senior Research Officer
- Robin Bougeois**,\* Research Associate
- Edwin Brush**, Senior Research Officer
- Marie-Hélène Collion**, Senior Research  
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- Rudolf Contant**, Senior Research Officer
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- Thomas Eponou**, Senior Research Fellow
- Wilhelmina Eveleens**, Research Assistant
- Pablo Eyzaguirre**, Research Officer
- Shenggen Fan**, Research Associate
- Alan Fletcher**,\* Senior Research Officer,  
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- Dely Gapasin**, Senior Research Fellow
- Govert Gijsbers**, Research Associate
- Peter Goldsworthy**, Senior Research Officer
- Ghazi Hariri**, Senior Research Officer
- Huntington Hobbs IV**,  
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- Charles Kramer**, Senior Research Officer
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- Paul Marcotte**, Senior Research Officer,  
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- Valentina Mazzucato**,\*\* Research Assistant
- Adiel Mbabu**, Research Fellow (based in  
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- Deborah Merrill-Sands**,  
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- Byron Mook**, Senior Research Officer
- Barry Nestel**, Senior Research Officer
- George Norton**, Senior Research Fellow  
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- Andrew Okello**, Research Ass.stant
- Paul O'Nolan**, Information Management  
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- Philip Pardey**, Senior Research Officer
- Paul Perrault**, Senior Research Officer
- Gabrielle Persley**,\* Senior Research Officer
- Warren Peterson**, Research Fellow
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- Motlubor Rahman**, Senior Research Officer  
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- Jonathan Sands**,\* Research Associate
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- Ajibola Taylor**, Senior Research Officer
- Gerald Toomey**, Editor/Head of  
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- Beatriz Uribe**,\*\* Research Assistant
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- Robert Witters**, Senior Research Officer,  
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Research Management
- Anna Wuyts**, Research Assistant

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**Richard Claase,** Artist/Designer  
**Jeanette Connelly,** Senior Secretary  
**Willy Dooren,** Secretary  
**Anne Duhr,** Senior Secretary  
**Carmel Freeman,\*\*** Secretary  
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**Helen Gaskin,** Secretary  
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**Manon Kleinveld,** Senior Secretary  
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**Concilio McNeill,\*** Central Files  
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**Sarah Neal,** Supplies Assistant  
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**Tracy van Putten,\*** Secretary

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**Joyce Voorn-Ogiste,** Senior Secretary  
**Lorraine Walton,\*\*** Secretary  
**Cathy Wheat,\*\*** Publications Assistant

\*\* Joined during 1991

\* Left during 1991

## Donors Supporting ISNAR — 1991

- Asian Development Bank
- Australia
  - Australian International Development Assistance Bureau
  - Australian Centre for International Agricultural Research
- Belgium
  - Administration Générale de la Coopération au Développement
- Brazil
- Canada
  - Canadian International Development Agency
  - International Development Research Centre
- People's Republic of China
- European Economic Community
  - Commission of the European Communities
  - Technical Centre for Agricultural and Rural Cooperation
- Finland
  - Finnish International Development Agency
- France
- Germany
  - Federal Ministry of Economic Cooperation
  - GTZ
- Italy
- Japan
- Luxembourg
- The Netherlands
- The Philippines
- Rockefeller Foundation
- Spain
- Sweden
  - Swedish Agency for Research Cooperation with Developing Countries
- Switzerland
- United Kingdom
- United Nations Development Programme (UNDP)
- United States
  - Agency for International Development
- The World Bank

Note: The above list does not include countries and institutions that have reimbursed ISNAR's expenditures for services rendered.

## ISNAR Financial Summary

### ISNAR Balance Sheet (as of December 31, stated in US Dollars)

<u>Current Assets</u>	<u>1991</u>	<u>1990</u>
Cash	2,056,831	2,395,490
Receivables from Donors	817,500	433,878
Other Receivables	294,311	361,420
Prepayments	404,572	184,028
Total Current Assets	<u>3,573,214</u>	<u>3,374,816</u>
<u>Fixed Assets</u>		
Property, Plant & Equipment (at cost)	1,981,819	2,095,395
Accumulated Depreciation	<u>(1,287,537)</u>	<u>(1,605,949)</u>
Total Fixed Assets (net book value)	<u>694,282</u>	<u>489,446</u>
 <u>TOTAL ASSETS</u>	 <u>4,267,496</u>	 <u>3,864,262</u>
 <u>Liabilities</u>		
Advance Received on Next Year's Core Donation	-- 0 --	83,921
Accrued Expenses	<u>961,676</u>	<u>873,480</u>
Total Liabilities	<u>961,676</u>	<u>957,401</u>
 <u>Fund Balances</u>		
Capital Invested in Fixed Assets	694,282	489,446
Unexpended Funds:		
- Core-Unrestricted	(116,099)	(45,743)
- Core-Restricted	255,542	288,641
- Capital Fund	(204,836)	0
- Working Fund	1,750,000	1,750,000
- Special Projects	<u>926,931</u>	<u>424,517</u>
Total Fund Balances	<u>3,305,820</u>	<u>2,906,861</u>
 <u>TOTAL LIABILITIES AND FUND BALANCES</u>	 <u>4,267,496</u>	 <u>3,864,262</u>

### Sources and Application of Funds (Stated in US Dollars)

<u>Source of Funds</u>	<u>1991</u>	<u>1990</u>
1. Core Operations		
Unrestricted	7,224,836	6,374,000
World Bank (for External Review)	250,000	0
Restricted	315,062	472,000
Unrestricted Balance from Prior Year	(45,743)	29,096
Restricted Balance from Prior Year	288,641	470,132
Earned Income Applied to Core Operations	685,601	1,128,515
	<u>8,718,397</u>	<u>8,473,743</u>
2. Capital		
Unexpended Balance from Prior Year	0	97,363
Earned Income Applied to Capital Fund	302,368	0
	<u>302,368</u>	<u>97,363</u>
3. Working Fund		
Unexpended Balance from Prior Year	1,750,000	1,750,000
4. Special Projects - Cumulative		
Income on Projects not Completed	6,358,067	7,474,102
	<u>6,358,067</u>	<u>7,474,102</u>
<b><u>TOTAL SOURCE OF FUNDS</u></b>	<b>17,128,832</b>	<b>17,795,208</b>
<b><u>Application of Funds</u></b>		
1. Core Operations		
Advisory Services to NARS	2,822,270	3,444,042
Research	2,050,252	2,161,882
Training	1,498,581	1,380,745
Program Support	617,525	515,593
Management & Administration	1,182,073	728,583
External Review	408,253	0
	<u>8,578,954</u>	<u>8,230,845</u>
2. Capital		
Capital Additions	507,204	97,363
3. Special Projects - Cumulative		
Expenditure on Projects not Completed	5,431,136	7,049,585
4. Unexpended Balance		
Core - Unrestricted	(116,099)	(45,743)
Core - Restricted	255,542	288,641
Capital Fund	(204,836)	0
Working Fund	1,750,000	1,750,000
Special Projects	926,931	424,517
	<u>2,611,538</u>	<u>2,417,415</u>
<b><u>TOTAL APPLICATION OF FUNDS</u></b>	<b>17,128,832</b>	<b>17,795,208</b>

## CGIAR-Supported International Agricultural Research Centers

1. **CIAT** Centro Internacional de Agricultura Tropical, Cali, Colombia
2. **CIMMYT** Centro Internacional de Mejoramiento de Maíz y Trigo, El Batán, Mexico
3. **CIP** Centro Internacional de la Papa, Lima, Peru
4. **IBPGR** International Board for Plant Genetic Resources, Rome, Italy
5. **ICARDA** International Center for Agricultural Research in the Dry Areas, Aleppo, Syria
6. **ICRAF** International Centre for Research in Agroforestry, Nairobi, Kenya
7. **ICRISAT** International Crops Research Institute for the Semi-Arid Tropics, Hyderabad, India
8. **IFPRI** International Food Policy Research Institute, Washington, D.C., U.S.A.
9. **IIMI** International Irrigation Management Institute, Colombo, Sri Lanka
10. **IITA** International Institute of Tropical Agriculture, Ibadan, Nigeria
11. **ILCA** International Livestock Centre for Africa, Addis Ababa, Ethiopia
12. **ILRAD** International Laboratory for Research on Animal Diseases, Nairobi, Kenya
13. **INIBAP** International Network for the Improvement of Banana and Plantain, Montpellier, France
14. **IRRI** International Rice Research Institute, Los Baños, Philippines
15. **ISNAR** International Service for National Agricultural Research, The Hague, The Netherlands
16. **WARDA** West Africa Rice Development Association, Bouaké, Côte d'Ivoire

