

Report of a Conference

Training Needs in National Agricultural Research Planning and Management

ISNAR/EDI Colloquium

ISNAR

International Service for
National Agricultural Research
The Hague, Netherlands



Economic Development
Institute of the World Bank
Washington DC, USA

The International Service for National Agricultural Research (ISNAR) began operating at its headquarters in The Hague, Netherlands on September 1, 1980. It was established by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force, for the purpose of assisting governments of developing countries to strengthen their agricultural research. It is a non-profit autonomous agency, international in character, and non-political in management, staffing and operations.

Of the thirteen centers in the CGIAR network, ISNAR is the only one which focuses primarily on national agricultural research issues. It provides advice to governments, upon request, on organization, planning, manpower development, staff requirements, financial and infrastructure requirements, and related matters. Thus complementing the activities of other assistance agencies. Additionally, ISNAR has an active training and communications program which cooperates with national agricultural research programs in developing countries.

ISNAR also plays an active role in assisting these national programs to establish links with both the international agricultural research centers and donors.

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Training Needs in National Agricultural Research Planning and Management

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Introduction

Over the years, a great many observers of agricultural research in the developing countries have emphasized the crucial importance of competent management. If agricultural research is to become more effective, it is imperative that there be improved abilities in research organizations to plan and administer resources. Skilled managers are needed to direct the productivity of such organizations.

A major constraint on many research programs, however, continues to be the scarcity of such managers. Scientists are often promoted into senior management positions without adequate management experience. Thus, it is not unusual to observe research programs initiated and directed on a quite informal and unsystematic basis. In such a setting, implementation of results depends largely on the personal energy of program leaders. Communication among programs is haphazard, and the linkages between researchers and farmers are weak.

What are the best ways of stimulating improvement in research management?

In September 1982, the International Service for National Agricultural Research (ISNAR) and the Economic Development Institute of the World Bank (EDI) conducted a three-day colloquium in The Hague to explore one possible answer to this question. The colloquium focused mainly on two objectives:

- to assess the need for in-career management training for research leaders;
- to recommend what subjects such management training should cover.

Each of six half-day sessions was devoted to analysis of a single topic. Each session was chaired by a discussion leader, chosen for experience with the topic under analysis. The leader opened with a statement on the issues as he saw them, and he posed several questions. This report presents a summary of the discussions and the conclusions.

Twenty-seven individuals participated in the colloquium. Some were officials of national research programs; both developing and developed countries were represented. Others came from donor organizations and some from private-sector firms.

Research Management

One of the major challenges to the colloquium was to establish a precise meaning of the term *research management*. How is the management of agricultural research different from the management of anything else? And how is the management of agricultural research in Asia, Africa, and Latin America different from the management of agricultural research elsewhere? Most of the research and contemplative writing on this subject has been done in the more developed countries.

Participants approached the response to such questions by resolving research management into some of its functional components. They identified six.

1. Program Identification and Planning

The central theme under this heading is the process by which needs and problems come to the attention of researchers and are subsequently translated into research programs.

Participants agreed that the starting point for an appropriate research program must be an understanding of the problems faced by farmers. Unless a program responds to the needs of the rural community, it faces at least two serious risks: (a) it will be regarded as being irrelevant; (2) it will lose the political and financial support it requires.

But how does a national research program take account of farmer circumstances? Several participants spoke approvingly of the planning methodology utilized in the Economics Program of the Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) (1). Research policy-makers and scientists must know what kinds of information about farmers they should have and how to go about collecting it. The fact that many research programs are begun without an analysis of farmer needs is almost certainly due to the fact that most national research managers have not set up procedures for making such analyses.

Why not? A major reason seems to be that the investigation of farmer circumstances is a task that must be shared between social scientists and biological scientists. Most national research organizations do not have strong socio-economic units. Even those that do tend to assign them peripheral roles in the planning process. There was seen to be a very clear need for training here. Even in short courses, research managers can be exposed to

(1) CIMMYT, 1980. *Planning Technologies Appropriate to Farmers: Concepts and Procedures*;

- the different types of farm-level data necessary for planning;
- alternative means of collecting farm-level data;
- procedures for using farm-level data in identifying research priorities and planning research programs.

2. Financial Management

This topic can be delineated into two broad activities: budgeting and accounting.

Budgeting

For most research organizations, the preparation of the annual budget is a major management activity. Although procedures and processes vary considerably from organization to organization, answers to the following two sets of questions can provide at least some basis for comparisons.

a. How is the allocation of resources to agricultural research determined? What are the respective roles of the Ministry of Planning, the Ministry of Finance, the Ministry of Agriculture, other ministries, elected assemblies, local organizations, and interest groups?

b. How is the allocation of resources within agricultural research determined? What parts are played by the director, headquarters staff, program leaders, station managers, and individual scientists?

A significant variable in both processes is clearly the degree to which decision-making is centralized. In many national agricultural research systems, allocations to research appear to be made at high levels by a limited number of persons -- often persons not in frequent interaction with research managers or scientists. Participants in the ISNAR/EDI colloquium did not believe that training was likely to have much influence on this process. Seminars might make a limited contribution to sensitizing policy-makers to the importance of research, though more direct means (such as international study tours and local field trips) would probably have greater impact.

However, at the second level (within research organizations) participants believed there was more scope for improving the ways in which budgets are devised. One critical requirement is that decision-makers have detailed information on all major research projects in order to effectively examine program and station budget estimates. How do they obtain

such information? In many research systems, particularly those which lack established data reporting and analysis procedures, the main budgeting officers have spent much of their careers in research. Therefore, they know (or, more important, think they know) all about their programs. The result is that budgets are often based more on personal opinions than on actual data analysis.

For some national organizations, a further obstacle to rational budgeting is the uncertainty of the process itself. When unexpected budget reductions are imposed on research programs during a year, as is now happening more and more frequently, research managers are forced to revise their budgets to effect economies. Such repetitive budgeting is characteristic of many public-sector organizations in nonindustrial societies. Such reductions affect the efficiency of ongoing projects. They also force officials to devote significant time in detailed rebudgeting analyses. More systematic approaches to contingency planning, appropriate topics for training, should result in improved performance in this area of management.

Accounting

Most research managers apparently spend little time on the review of accounts. Operational responsibility for day-to-day disbursement of funds and the maintenance of records lies primarily with executive officers and clerks. At periodic intervals, reports are prepared on both income and expenditures. Most rules and procedures are stipulated in government civil service directives. In two circumstances, however, accounting becomes an issue requiring more attention from senior managers.

a. In periods of financial stringency, increased emphasis has to be placed on day-to-day control of expenditures. Current accounting data are important for the senior manager who is involved in the rebudgeting exercises indicated above.

b. When new budgetary procedures are being introduced, senior managers require accounting data that can be organized in alternative ways. Examples of new approaches being tried in some research organizations include program budgeting and zero-base budgeting.

Colloquium participants were of the opinion that training in the use of microcomputers for assistance in financial management would be a very worthwhile endeavor.

3. Operations Management

Questions discussed at the colloquium under this heading included the following. How are research facilities procured, equipment maintained, and logistics organized? How are offices administered? What are the major jobs of administrative officers and station managers?

Several participants observed that the uncertain availability of physical supplies is often one of the biggest constraints on research. Problems can arise at any, or all, of a number of different management levels. Funds may not be available to buy what is needed, training in the use of equipment may be inadequate, and repair may depend on schedules in other organizations. The usual result is that the manager spends considerable time trying to cope with shortages or inoperable equipment.

Transportation is a prominent problem mentioned by participants. National research organizations usually have scientists and managers posted at various locations around the country. Without vehicles, those based at headquarters tend to stay near their offices. Visits to other parts of the organization and to farmers' fields are therefore infrequent. The pertinent question is whether shortage of vehicles is inherent or whether it is the result of inadequate management, such as in scheduling and maintenance. If it is the latter, one solution may be training for selected personnel in motor pool administration.

Another problem is technical support. Equipment is often procured before sufficient consideration is given to such a fundamental matter as who is going to operate it. Equipment purchases may require the hiring of new staff or the training of existing personnel. Again, an appropriate question in the training context is the degree to which these are management problems. If they are, one solution may be the setting up of a training office in the organization which has responsibility to deal promptly when such problems become apparent.

Beyond these matters, which are concerned specifically with the management of physical facilities, several participants described what they see as major problems with office management. They noted that administrative rules and procedures in many agricultural research organizations remain largely unchanged from much earlier times. The ways in which orders, reports, registers, and statistics are handled might once have been appropriate. Now they may be cumbersome or even irrelevant.

A striking example cited by participants is reporting. In many organizations, subordinate officers make their periodic reports on set forms. The information asked for is often objective (statistical, for example) rather than subjective (such as personal analysis). Superior officers often lack either the time or the inclination to go through such reports carefully. As a result, much time can be spent on reporting, with little benefit in the evaluation of either programs or performance.

There may also be frequent problems with paper flow. A shortage of typewriters, not at all uncommon in the settings considered by the colloquium, means that much paper communication is handwritten. The product is often

difficult to read and filing can be a major problem. Training in office management is one possible solution to such problems, particularly if such training can incorporate the use of new office equipment. For example, some national agricultural research organizations now have microcomputers for scientific analysis. The addition of software for word processing and accounting could make them useful for operations management purposes as well.

A final item discussed in this category was the management of on-farm research. Such research obviously requires many kinds of inputs (e.g., seeds, chemicals, vehicles). However, most organizations have not devised procedures for making such inputs available to scientists at the time they are needed. The increasing tendency of senior officials to place a high priority on transferring important components of the research program onto farmers' fields complicates this situation. Station managers may be caught in the middle: under stimulus of the wishes of their superiors, scientists come to the station manager requesting inputs. But the station manager may not have been involved in planning for such off-station trials, and he may have no way to monitor the use of whatever inputs might be provided. Possible solutions to this problem include improved scheduling routines and more flexible stock control procedures. Both of these are potential topics for management training.

4. Personnel Management

Major themes discussed under this heading at the colloquium were the recruitment of scientific and managerial personnel and the conditions of service under which they work.

Recruitment

What qualifications do research organizations set for entry into various positions and why? Years ago, most young people acquired most of the professional skills on the job. In-career training, such as an apprenticeship, was the norm. New recruits learned both science and management by working under experienced scientists and managers. At present, however, this pattern has been changed by mass formal education. Most employers of agricultural research workers in developing countries now expect that recruits will have acquired their basic skills and knowledge at educational institutions. Degrees are important. Academic qualifications for selection have taken precedence over nonacademic ones. Indeed, educational qualifications have been continually raised as the supply of qualified personnel has grown. Increasingly the emphasis has shifted to qualifications achieved before the research career begins.

National agricultural research organizations often require that candidates for a scientist appointment have at least a first

degree. At the same time, however, research leaders usually agree that many basic and relatively routine scientific jobs could be done by persons without a degree. So why are those less-qualified people not hired? Two reasons are most commonly cited.

a. In many countries there is a surplus of university graduates, and public organizations, such as research institutes, are under political pressure to employ them.

b. Promotions of research personnel are often based mainly on seniority. This raises the possibility that nondegreed recruits might eventually rise to top positions, although their scientific qualifications might be inadequate.

There are several reasons why recruitment is a crucial issue for agricultural research managers and why this issue is likely to become even more crucial in the immediate future.

a. Recruits with higher qualifications command higher placements on civil service salary scales. If such people are hired in substantial numbers, either recurrent budgets for research will have to be increased or salaries and benefits will consume increasing proportions of the available funds. In periods of financial stringency, the latter situation seems the more probable.

b. Because higher qualified recruits obtain higher placements, they also reach various salary and job ceilings earlier. This increases the possibility of early stagnation and, therefore, the probability of lower motivation and higher mobility to jobs outside the organization.

c. Because higher postings are largely closed to nondegreed recruits, those in lower grades also face similar stagnation.

Careers

The considerations outlined above are obviously tied closely to the issue of careers. The most important question about careers is: How is an individual's position in agricultural research defined? Is it by his education (qualifications), or by what he does (job description), or by his salary (grade)? If the position is defined by two of these or indeed all three, precisely what is the relationship between them?

Presently many national research organizations are experiencing a partial inversion of their staff pyramids. At one time, it was common to refer to the number of scientists to support technicians by ratios of 1:2, 1:3, or even 1:4. In many systems at present, the ratio may be 1:1 or even 2:1. That is, more scientists than support technicians. The reasons have been mentioned above: the increasing recruitment of additional highly qualified scientists, which commits a larger share of the recurrent budget, and what technicians see as career prospects for themselves, including inadequate salaries.

Such a situation is often aggravated by a lag between the qualifications of potential recruits entering the market and the conditions of service available to them. For example, the growth of secondary education has produced many diploma and certificate holders having academic qualifications that rank only just below those held by university degree recipients. Naturally the former group seeks careers with opportunities to catch up. Because they are academically less qualified and are therefore not classified as scientists, they have limited prospects for advancement.

Participants at the colloquium agreed that a major challenge to managers in most national agricultural research organizations is the need to resolve this whole issue of service conditions. Without reappraisal and remedial action, research finances and staff stability are both apt to suffer.

5. Information Management

The subject of information management seldom receives the attention it deserves. It consists of two parts: communication within agricultural research organizations and communication between such organizations and external audiences, including other government agencies and farmers.

Within research organizations, scientists often have little knowledge of programs at institutes or stations other than their own. Horizontal communication with other scientists is minimal, both in person and through publications. Opportunities for travel and for membership in professional societies are limited. Both are effective ways for scientists to keep abreast of advances in the frontiers of their field.

Even vertical communication is often inadequate.

One example noted by participants is the way in which senior officers supervise their field-level subordinates. Often such supervision is done on a face-to-face basis. This is an effective but costly method since it requires officers to spend substantial amounts of time on the road, e.g., headquarters personnel visiting stations, station heads visiting field installations. Many research managers indicate that they wish they had better methods for directing their subordinates.

Written communications might serve just as well if both senior officers and subordinate officers could write more efficiently and if both knew how to handle written reports and requests. A relevant need for better information management would be training in word processing techniques with microcomputers.

National agricultural research organizations usually have an information section or access to the services of one. Along with other responsibilities, such a section is typically charged with maintaining a small library, issuing publications, and

providing a formal link with extension services, mass media, and other audiences. However, there are common problems.

a. The resources of the library, and its use, tend to be limited. A large central library is usually located far from the field-level scientists who might need and use it most.

b. The audiences for publications on research are not well defined. Annual reports appear to be written only for professional audiences at home and abroad. There is almost always a need in national agricultural research organizations for considerable attention to communication on public affairs and public relations.

c. Research results generally flow to an information section, or other recipients, as abstract and complex reports. They are not always easy to revise and transmit in forms that extension agents and the public can easily understand and use.

These last two items concern relations between research activities and external groups. Another matter in the same general category is the handling of visitors to research facilities. Many senior research officials report that they devote significant amounts of time to visitors, local and foreign. Clearly, such visitors are important: local visitors, because of political support, and foreign visitors, because of financial support. The time of senior officials could often be saved if visitors were handled in more systematic and efficient ways. The use of audiovisual material for general introductions, statistical services for the presentation of specific data, and group seminars and field trips are examples.

6. Relating Research to Its Users

The central themes under this heading are perhaps best summarized in two questions:

a. Who are the consumers of the products of agricultural research? Are they small farmers, all farmers, extension workers, input suppliers, professional journal editors, or who?

b. How is the research product best delivered to the potential consumer?

Participants in the colloquium agreed that each research institute or station manager who seeks to deal with such matters must ask and answer even more specific questions:

- How has my organization identified the consumers of its research?
- What kinds of packages of technology or other information does my organization actually have available to transfer?

- How does my organization ensure that these packages of information are in fact transferred to consumers?

Most managers of agricultural research have given inadequate attention to such issues. In the discussion of program identification and planning, reference was made to the importance of taking farmer circumstances into account. Beyond that methodological problem is a structural one, that of determining which farmers' circumstances will be taken into account. The fact is that many research institutes or stations have national mandates for assigned commodities, yet they tend to concentrate activities on particular agroclimatic areas, typically the area in or near their own locations. The result is that the consumers of their research are likely to be regional rather than national.

The importance of this issue in the research system is probably more political than scientific. If an institute or station is seen as regional, it will likely become part of a regional political agenda. It is then probable that at least some of its resources will become dependent on considerations of regional balancing and patronage. In the opposite situation, in which an institute or station has a national clientele, resource allocations can be made on basis reflecting the role of that research in the national economy.

Identification of clientele is a theme that runs through program formulation, the politics or public relations of agricultural research, and research and extension linkages. It is relevant also to the current interest in many national programs for farming systems research. A major objective of such research is to identify clientele and, with them, to identify opportunities for research that will improve some features of their situation. Insofar as this work takes researchers into farmers' fields (which is a basic principle of on-farm research) it may involve them directly with local politics and extension organizations.

On-farm research is seen by some observers as a valuable strategy in delivery of research, in addition to its role in developing appropriate technology fitted to specific farmer circumstances. The research management thus needs to ask more questions. How does an on-farm research program interact with an extension service? To what extent does such a program relate to traditional extension activities? On what basis are choices made about the particular farm fields for inclusion in its program of testing?

Participants in the colloquium agreed that issues related to the delivery of research products were among the most important that research managers have to deal with. They further agreed that public-sector managers, which most national agricultural research managers are, could learn much from the private sector. Specifically, by their very nature, private research programs tend to have a strong end-

use orientation. In contrast, public programs sometimes do not pay enough attention to end-users and, therefore, tend to become bureaucratized. The often-cited advantages of public-sector research (for example, in carrying out basic work or in doing work of social value, rather than purely commercial value) should not be overemphasized.

Research Managers

So far, this report on the colloquium has dealt with defining research management. Six managerial functions were identified by the colloquium:

- program identification and planning;
- financial management;
- operations management;
- personnel management;
- information management;
- relating research to its users.

But who are the research managers? Who are the officials actually responsible for performing these managerial functions? Participants in the colloquium believed it necessary to deal with such questions in order to come to conclusions about training needs.

At the high end of the scale of persons involved in management of agricultural research are the ministers of agriculture and permanent secretaries of agriculture. Clearly, officials at this level of management are concerned with matters relating to the very broad issues of agricultural

policy. Accordingly, these categories of persons were not included in connection with the colloquium's question of training for agricultural research management.

There are other levels of officials who would benefit from training related to agricultural research management. In descending hierarchical order, the list emerged as follows:

- directors general of agricultural research;
- directors of discipline- or commodity-oriented institutes;
- program leaders;
- managers of research stations;
- executive officers.

The question, then, is, *who* needs to know *what* about agricultural research management?

One way to arrive at answers to this question is to construct a matrix with the *what* of research management comprising the rows of the matrix and the *who* of research managers composing the columns. Table 1 is such a matrix.

Table 1. Matrix display of managerial functions in agricultural research management related to five potential audiences for training.

Research Managers \ Research management	DCs of agric. res.	Directors of Institutes	Program leaders	Managers of res. stations	Executive Officers
Program identification and planning					
Financial management					
Operations management					
Personnel management					
Information management					
Relating research to its users					

Participants in the colloquium believed that ministers of agriculture, permanent secretaries of agriculture, and directors general of agricultural research need to have a broad understanding of agricultural research. These persons must have a sense of what research can accomplish and what it cannot. They must realize how long it takes to produce results. They must consider the probable clientele for the research outputs. They must be aware of the relationships concerning research results with other organizations and activities in the political system.

Such subjects clearly have as much to do with research policy as with management skills, or more.

Management Training

Throughout the colloquium, participants identified and discussed specific subjects that might be covered in courses and seminars designed to provide training in managerial skills for agricultural research managers. The following list of 19 subjects was developed from the discussions.

1. Program Identification and Planning

- Data requirements for program formulation
- Methods of data collection
- Procedures for making the most productive use of data

2. Financial Management

- Program budgeting
- Contingency budgeting

3. Operations Management

- Office administration
- Report writing and report evaluation
- Utilization of microcomputers
- Organization of on-farm research
- Transportation administration
- Development of training programs

4. Personnel Management

- Manpower planning
- Career planning

5. Information Management

- Supervision of field-level subordinates
- Uses of central documentation centers
- Public relations for agricultural research
- Efficient handling of visitors

6. Relating Research to Its Users

- Identification of clientele for research results
- Technology transfer from research to extension and farmers

In probing on how training in such subjects should be conducted, participants emphasized that formal courses are only part of an individual's overall career development. Most learning occurs on the job and will continue to occur there. Participants agreed that formal management training could be useful, however, if it were part of a plan for career

development specifically designed for each individual scientist and manager. A problem is that such plans, presently, are the exception rather than the rule in most national agricultural research organizations.

Clearly, courses and seminars must be specifically designed for the persons who attend them. It is therefore difficult, participants believed, to generalize about formats, types of materials, and teaching staffs most appropriate to various subjects and different training groups.

Rather than attempting to reach conclusions about priorities for all possible subjects and clientele, participants examined the potential roles in research management training of organizations like ISNAR and EDI. The following activities were specifically considered and endorsed:

1. The identification of national and regional organizations with the capacity to undertake training programs in agricultural research management.
2. Cooperation with such national and regional organizations to develop curricula and training materials.
3. Support to such organizations for development of their own staffs.
4. Participation in the training programs that develop from relationships with these organizations.
5. Development of linkages among organizations involved in agricultural research management training. Such linkages might include the exchange of training materials and staff.

Conclusion

At the end of the colloquium, participants summarized their observations by relating the range of research management subjects to the groups of research managers who would benefit from such training.

For directors general of agricultural research, the following subjects were believed to be the most relevant:

- the role of agricultural research in a national socio-economic system;
- the potential contribution of agricultural research to national development;
- methods of resource allocation to agricultural research.

For institute directors, program leaders, station managers, and executive officers, emphasis should be placed on the following subjects:

- project identification and priority determination;
- budgeting;
- project monitoring and evaluation;
- staff development;
- communication – both within and between organizations.

Several participants indicated that new young staff members in agricultural research organizations should receive at least a general introduction to management principles and skills. Their reasoning was that young scientists would learn much more about management on the job if they were sensitive to the appropriate things to look for.

Finally, if priorities need to be set for the potential groups for training, the consensus was that institute directors and program leaders should get first attention.

As a result of the colloquium, both ISNAR and EDI acquired a better sense of the meanings and implications implicit in the term *agricultural research management training*. It was agreed that the subject itself is very comprehensive and the number of people who could benefit from training is very large.

Training is seen as an invaluable mechanism for strengthening management capability in national agricultural research systems. A more direct way would be to work for organizational change itself. (As a finding in their various country reviews, ISNAR teams have observed that existing rules and procedures, even more than managerial capacity, are often the biggest deterrents to increased research productivity.) Excessively high hopes for training are

probably ill-advised. A major problem for many in-career trainees, who have gone to developed-country institutions for management training, has been that they returned to organizational environments in which they could not effectively apply what they had learned.

At the same time that organizational changes are occurring, however, professional staff with the insights and capabilities to manage agricultural research resources well can be developed. During the coming period, ISNAR will further develop its training activities in each of the six agricultural research management subjects considered at the colloquium. It will work with institutions in Asia, Africa, and Latin America in the organization of courses and seminars. And it will continually analyze its own ever-increasing experience with national agricultural research systems to strengthen the resources of research management and research managers.