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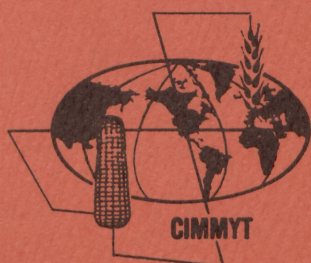
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# Issues in Organization and Management of Research with a Farming Systems Perspective Aimed at Technology Generation

Proceedings of a Workshop



***ISNAR***

WAITE MEMORIAL BOOK COLLECTION  
DEPT. OF AGRIC. AND APPLIED ECONOMICS

**Centro Internacional de Mejoramiento de Maíz y Trigo**

**International Service for National Agricultural Research**

The International Maize and Wheat Improvement Center (CIMMYT) is an internationally funded, nonprofit scientific research and training organization. Headquartered in Mexico, CIMMYT is engaged in a worldwide research program for maize, wheat, triticale and barley, with emphasis on food production in developing countries. CIMMYT is one of 13 nonprofit international agricultural research and training centers supported by the Consultative Group for International Agricultural Research (CGIAR).

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.

ISNAR is the only center within the CGIAR network 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, complementing the activities of other assistance agencies. In addition, ISNAR has active training and information programs which cooperate 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.

CIMMYT and ISNAR are supported by a number of members of CGIAR, which is sponsored by the Food and Agriculture Organization (FAO) of the United Nations, the International Bank for Reconstruction and Development (World Bank), and the United Nations Development Programme (UNDP), and which is an informal group of more than 30 donors; it includes countries, development banks, international organizations and foundations.

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# **Issues in Organization and Management of Research with a Farming Systems Perspective Aimed at Technology Generation**

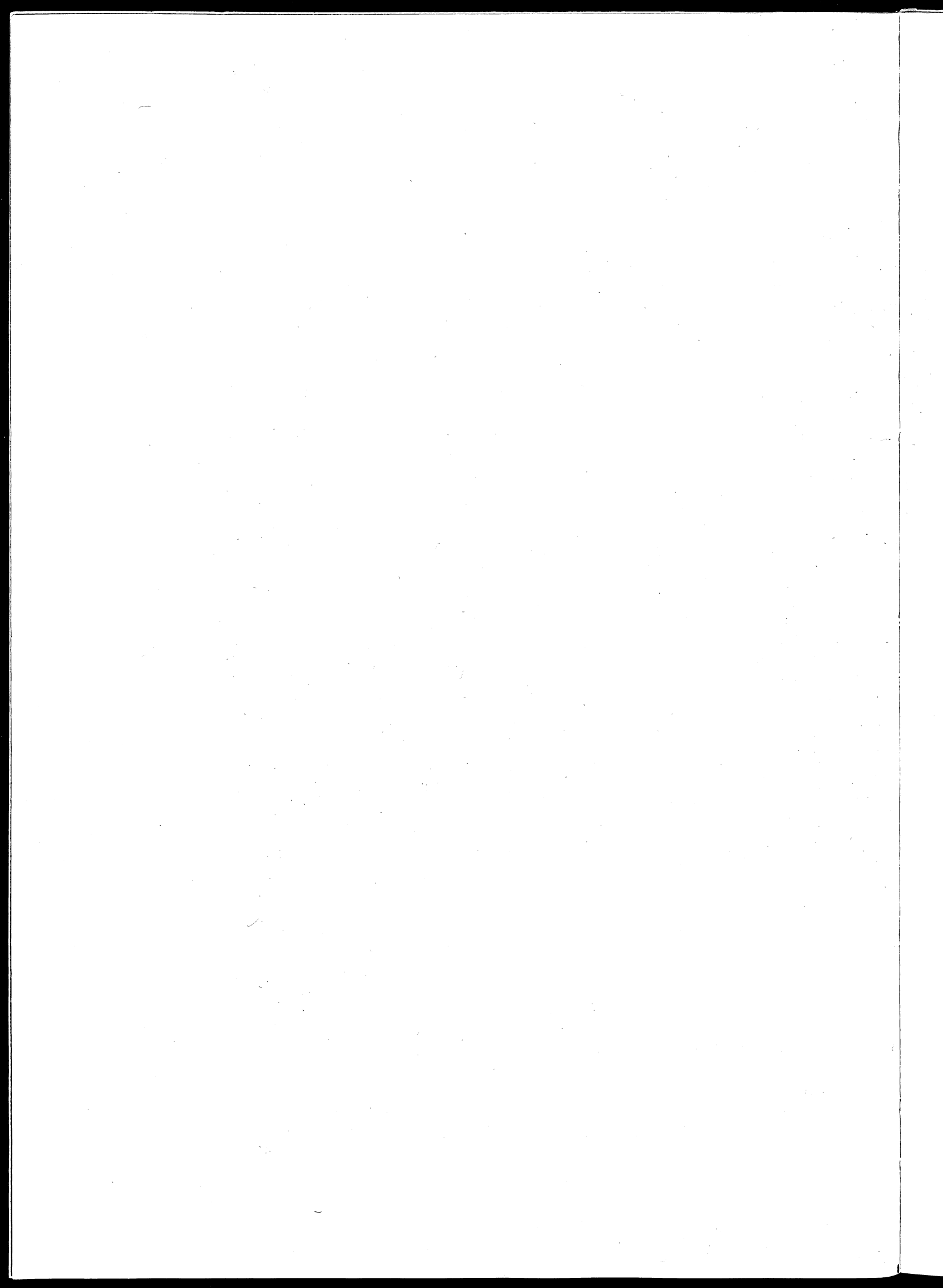
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## Acronyms

CATIE	Tropical Agricultural Research and Training Center (Centro Agronómico Tropical de Investigación y Enseñanza)
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center (Centro Internacional de Mejoramiento de Maiz y Trigo)
FSR/OFR	Farming Systems Research/On-Farm Research
IAR/ABU	Institute of Agricultural Research/Ahmadu Bello University
IARC	International Agricultural Research Center
IBRD	International Bank for Reconstruction and Development (World Bank)
ICRA	International Course for Development Oriented Research in Agriculture
ICTA	Agricultural Science and Technology Institute (Instituto de Ciencia y Tecnología Agrícolas)
IDIAP	Agricultural Research Institute of Panama (Instituto de Investigación Agropecuaria de Panamá)
INIAP	National Institute for Agricultural Research (Instituto Nacional de Investigación Agropecuaria)
ISNAR	International Service for National Agricultural Research

# 1. Introduction

This workshop was cosponsored by the International Service for National Agricultural Research (ISNAR) and International Maize and Wheat Improvement Center (CIMMYT). The small work group met from September 27-30, 1983, at ISNAR's headquarters in The Hague, Netherlands.

The idea for the workshop came from CIMMYT, which felt that enough countries had had sufficient experience with Farming Systems Research/On-Farm Research (FSR/OFR) to justify comparative stock taking. The aim was not the refinement of methodologies for carrying out Farming Systems Research, rather it was to see if reliable and generalizable principles in organization and management of FSR existed that could be recommended elsewhere. ISNAR's immediate interest in seeing that the workshop took place is understandable since ISNAR's primary objective is to help improve a national agricultural research system so that it can better plan, organize, carry out, and evaluate agricultural research, using its own human, natural, and financial resources.

Farming Systems Research has meant different things to different people at various times. These differences still exist, though perhaps not with the same severity. A CGIAR study in 1978 noted differences in approach to FSR between IARCs, and the terms of reference of a recently commissioned state-of-the-art report on FSR by the World Bank refers to the need for "definitions of farming systems research as commonly used by those dealing with the topic."

To maximize the usefulness of what was intended to be a small group, the themes to be investigated were carefully delineated in the precise, though perhaps less than elegant, title of the workshop. It was clear from the beginning that a small workshop could not be expected to raise – much less adequately answer – all the legitimate questions within its restricted terms of reference. A conscious decision was made to select presentations from organizations that carried out

"research with farming systems perspective aimed at technology generation" using a broadly similar set of methodologies. The agricultural research systems involved were sufficiently dissimilar in their history, the moment, and degree to which they emphasized farming systems, to suggest the possibility of developing some insights into how best to incorporate a farming systems perspective in national agricultural research organizations.

Detailed presentations were made by Dr. G. Paez on the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica, Dr. G. Abalu on experiences from Nigeria, Dr. R. Tarte on experiences in Panama, Dr. A. Fumagalli on the Agricultural Science and Technology Institute (ICTA), Guatemala, and Dr. J. Delgado on experiences in Ecuador. Dr. W. Chibasa was expected to present a report on the experience of Zambia but found at the last minute that he could not attend. Dr. D. Winkelmann of CIMMYT, an IARC which has been significantly involved in FSR/OFR in Latin America and Africa, also made a presentation.

Since significant sums of money have been invested over the past 10 years in FSR or in agricultural/rural development projects with an FSR component, the organizers felt it would be worthwhile to learn what the donor community and international development organizations had to say concerning their experiences and projected plans. Dr. J. Coulter of the IBRD agreed to make a presentation, and Dr. H. Davis attended on behalf of USAID. Also present were Dr. J. Mieman and R. Waugh, University of Florida, both of whom had extensive experience in Latin America. Dr. J. R. Poulain of the Centre National d'Enseignement et de Recherches Agronomiques des Régions Chaudes (CNEARC), Montpellier, France, and Dr. M. Wessel, Director, International Center for Development Oriented Research in Agriculture (ICRA), Wageningen, The Netherlands, were also invited and participated actively in the deliberations.

In developing countries, agricultural research was



carried on, less well supported than in developed countries, but still quite in evidence. Researchers, often trained in developed countries, looked to developed country institutions, especially those in the public sector, for research models.

Results were not, however, so dramatic, except in the plantation/export crops. There were, of course, major impediments to progress in agriculture in developing countries – inadequate infrastructure, inappropriate policies, insufficient capital in the agricultural sector itself – but there was a growing impression that the research, as revealed through farmer reactions to recommendations, was somehow not right, that it could be improved.

Various improvements were suggested and implemented – e.g., larger staff, more graduate training, larger investment in experiment stations, more emphasis on commodity research – but the results, measured through increases in productivity, still did not meet expectations. There were some notable exceptions, such as the rapid diffusion of new rice and wheat varieties, but these only added to the consternation as they gave ample evidence of the farmer's willingness to make changes when recommended technologies were appropriate to his needs.

The challenge became how to make the research apparatus more effective. A major response to that challenge is the current emphasis on reorienting research towards the needs of representative farmers. Beyond that, many argue that meeting those needs will require more attention to the systems of production which farmers operate.

### **Farming Systems and Technology Generation**

Systems as the organizing unit for analysis have long been recognized in biology, ecology, and economics, and a substantial systems literature has developed since the 1920s. At the root of systems are interactions. Indeed, a system can be defined as an "aggregation or assemblage of objects joined in regular interaction or interdependence" (Webster's Second International Dictionary). With interactions, the whole is more or less than the sum of its parts. There are reports of research on technology based on systems in the 1920s and 1930s, with growing numbers in the 1950s and 1960s. Treating interactions is not a new idea.

What is only recently becoming evident, however, is the overriding importance of such interactions for representative farmers of developing countries, especially in subtropical and tropical regions, as compared with their role in developed country, temperate agriculture.

One recent paper (Byerlee, et al.) holds that the importance of interactions increases as two or more crops per year are possible; risk increases in importance, marketing margins widen, the opportunity cost of labor diminishes, and farmer-held resources are more heterogeneous. These considerations lead to complexity in the analysis of farming systems, increasing the importance of interactions. They are, moreover, among the prominent characteristics of representative farmers in the tropics and subtropics, hence the crucial importance of interactions in research on technology generation. Beyond that, and especially relevant to this workshop, attention to such interaction has significant implications for the organization and management of research on technology generation.

It is this view of the importance of interactions that sustains the growing emphasis being given to the system perspective – a perspective whose essence is to be mindful of interactions – in research aimed at technology generation. The importance of these interactions, along with such other considerations as the limited information available to researchers and the often vast differences between research station and representative farmer circumstances, support the need for a modified *modus operandi* in organizing research on technology generation.

The workshop came to a number of conclusions and recommendations. However, the participants agreed that equally important were the discussions which took place periodically between presentations and in the working groups. Numerous questions were raised, and partial answers suggested, which could not be readily included in the formal conclusions and recommendations of the workshop. A digest of these discussions is included under chapter 4 of the proceedings.

ISNAR firmly believes that a strong case exists for holding similar workshops in the future, with a different configuration of participants, where the organizational experiences of research with a farming systems perspective could be shared and discussed, and the findings of this workshop built upon.

## 2. Opening of the Workshop

### 2.1 Welcoming Address by M. Dagg, Representing Dr. W. K. Gamble, Director General of ISNAR

There is a rapidly growing interest in client-focused agricultural research with a farming systems perspective. This interest is evident in national research programs, in development assistance agencies, and in the international agricultural research centers of CGIAR. Attention is being focused on several aspects of the theme, including its role in technology generation, where an important client is the farmer with little capital. Many believe that this perspective offers an avenue for making research significantly more effective in generating and delivering appropriate technologies, especially to farmers in developing countries.

In the realm of technology generation with a farming systems perspective, considerable attention has been given to methodology, to fieldwork itself, and to analyses and documentation of results. Little has been done, however, about the emerging issues in managing such research. With increasing resources being allocated for this kind of research, there is some urgency in examining appropriate guidelines for their efficient management on a sustained basis.

Good progress has been made in the development of methodologies for carrying out farming systems research, and there are several units operating more or less successfully in different countries. However, in many cases the units have been created as special projects with external backing, and the experience of their absorption into the main body of agricultural research in the national system has been varied and inconclusive. This workshop has been called to benefit from these experiences, to tap the combined

wisdom of national practitioners, and to learn if there are reliable and generalizable principles in organization and management that may be safely recommended elsewhere. It would also be instructive to examine common difficulties encountered in different patterns of research organization.

The small group at this workshop therefore includes a selection of national research managers who have had direct experience in farming systems research in a national research system, those who have or have had responsibility for the organization and management of resources committed to such research.

It is hoped that the workshop will help to identify the problems peculiar to such research, to review from practical experience the management strategies which offer promise for resolving them, and to frame topics for research in management where experience suggests that solutions have yet to be found. Ultimately through the workshop and subsequent efforts, it is expected that ISNAR and others can offer guidelines which would assist national programs to better organize and manage this increasingly important aspect of the agricultural research systems.

We at ISNAR are pleased that you managed to find time to be with us here this week. I would like to express my own very special thanks, and the gratitude of all the participants to Dr. Carlos Valverde, who has been in charge of organizing this workshop, for his unstinting efforts, and for a job very well done indeed.

