

ICARDA



PN-ABU-714  
94375  
International Center for Agricultural Research in the Dry Areas

MART/AZR Project P. O. Box. 362 Quetta Pakistan Tel: 73248 Fax: 7836 ICARDA PI

## RESEARCH REPORT

No. 38  
REVISED VERSION

LINKING AGRICULTURAL RESEARCH  
AND EXTENSION

by

C. Talug, M.B.A Chowdry,  
Arshad Ali and M. Aslam

1989

# THE MART/AZR PROJECT

## HIGH ELEVATION RESEARCH IN PAKISTAN



*Pakistan Agricultural Research Council*

**ARID ZONE RESEARCH INSTITUTE**

Drewery Road, Quetta, Pakistan.

## MART/AZR PROJECT RESEARCH REPORTS

This research report series is issued by the Management of Agricultural Research and Technology Project/Arid Zone Research Component (MART/AZR). This project is sponsored financially by the Mission to Pakistan of the United States Agency for International Development (USAID).

The project contract is implemented by the International Center for Agricultural Research in the Dry Areas (ICARDA) and Colorado State University (CSU) at the Pakistan Agricultural Research Council's Arid Zone Research Institute (AZRI).

This Institute has responsibility for undertaking dryland agricultural research in all provinces in Pakistan through its headquarters in Quetta, Baluchistan and its sub-stations at D.I. Khan (NWFP), Umerkot (Sind) and Bahawalpur (Punjab)

The principal objective of the MART/AZR Project is the institutional support and development of AZRI in the period 1985-1989. This series of research reports outlines the joint research findings of the MART/AZR Project and AZRI. It will encompass a broad range of subjects within the sphere of dryland agricultural research and is aimed at researchers, extension workers and agricultural policy-makers concerned with the development of the resource-poor, arid areas of West Asia and the Middle East.

Libraries, individuals and institutions may obtain single copies of this research report series free of charge and may request that their names be placed on a mailing list for periodic notifications of published papers by writing to the MART/AZR Project Office, P.O. Box 362, Quetta, Pakistan.

**LINKING AGRICULTURAL RESEARCH AND EXTENSION**

**by**

**Cemal Talug, M. Bilal Ahmed Chowdry,  
Arshad Ali, and Muhammad Aslam**

**Quetta, 1989**

**This paper was presented at the Seminar on Livestock Research and Extension, sponsored by PARC, USAID and ICARDA, and organized by the Arid Zone Research Institute and the Balochistan Livestock Department on 26-30 May 1989 at the Serena Hotel, Quetta, Pakistan.**

## EXECUTIVE SUMMARY

Research and extension are mutually dependent in better performing their functions within an "agricultural knowledge system." Despite this obvious necessity, there has been a failure in establishing effective and operational linkages between research and extension in most developing countries.

It seems difficult to link weak services because they have little benefit to offer each other. Resource allocation and investment for either function should be considered in the context of strengthening the whole system. Synchronized development fosters better linkages.

Current values and incentives restrain researchers from having a real interest in farmers' adoption of research results, thus they discourage linkages with extension. Suitable indicators in the professional evaluation and reward system are needed to orient researchers to address farmers' needs. Whereas extension workers must be better educated and become more familiar with research procedures.

Highly differentiated personnel and remuneration policies create strain and tension between researchers and extension workers. Personnel policies are required to ensure shared objectives, and to give equal opportunities and proper rewards for specific skills.

Effective linkages cannot be established merely on the basis of personal, informal and occasional contacts of individual researchers and extension workers. Institutional linkages and built-in mechanisms are needed to safeguard sustainable coordination and cooperation. The present unilateral relations should be replaced with dynamic interaction.

The foremost problem in linking research and extension is the lack of farmer participation. Farmers should have a significant voice in determining the scope and output of research and extension.

## INTRODUCTION

The importance of linking agricultural research and extension has been well recognized and several efforts have been made for establishing effective and operational linkages between these two development instruments. In spite of efforts arising from this recognition, the problem of weak linkages still persists in most developing countries.

This paper examines the underlying reasons for persistent weak linkages and attempts to draw conclusions helpful to pave the way for improved linking. A brief presentation on the interdependence of research and extension is given at the beginning of this paper in order to review why linkage is necessary.

## INTERDEPENDENCE OF RESEARCH AND EXTENSION

The concept of "agricultural knowledge" can be used as a yardstick for examining the functions and relations of research and extension. Agricultural knowledge is a resource for production alongside capital, land and labor (Bunting 1986). A reference system within which agricultural knowledge is maintained, increased, applied, evaluated, disseminated and used, is called the "agricultural knowledge system." Although this system consists of a complex set of components and functions, in general, the main knowledge generating agency is the research organization, the main knowledge dissemination agency is the extension service and the ultimate knowledge users are the farmers. A dynamic interaction among the components of the system is inevitable if the common

objective, to improve the productivity and income of farmers, is to be reached.

The World Bank defines the functions of research and extension by giving emphasis to technology (the applied form of knowledge). Agricultural research consists of the scientific processes of generating new knowledge and translating new and existing knowledge into new technologies. The primary function of agricultural extension is to make these technologies available to farmers by providing relevant information and training them in how to take advantage of new technologies within their own production environments and goals. In addition, extension services provide information for researchers to maintain awareness of actual farmer problems (World Bank, 1985).

These definitions, and the role of research and extension in the agricultural knowledge system, clearly show that there is an obvious interdependence and a complementarity between the activities of research and extension. Research depends on extension to transmit its output to the end users, farmers, and to obtain information and feedback about farmer problems. Extension depends on research to find sound solutions to the problems of their clients. Investment in extension can not be justified without an established research back-up. This mutual dependence dictates the necessity for operational linkage otherwise success may be compromised for either research or extension activities.

Despite this interdependence why have there been poor linkages between research and extension in most developing countries? This paper attempts to provide answers to this question under the following five headings: reciprocal benefit; differences in orientation and values; differences

in status; built-in mechanisms; and farmer participation.

## A KEY FACTOR IN LINKING: RECIPROCAL BENEFIT

### What benefit will I get?

When a study for evaluating an extension scheme was conducted in southern Turkey, in 1982 (Talug, 1983) the lack of contact between researchers and extension workers in the area was observed. They were then approached and asked why they did not establish contact with each other. Almost all researchers and extension workers replied with a standard counter question: "What benefit will I get?" Extension workers described the research stations as places where nothing can be found relevant to the needs and conditions of their clients, the farmers. Researchers said that extension workers had no contact with farmers and were therefore unable to provide feedback about actual farm problems. They claimed that even if extension workers visit farmers, they are unable to understand and analyze the farmers' problems because of their poor qualifications and experience.

The act of communication (the core of the linking arrangement) is a time- and energy-consuming exercise, thus, it can be performed only if there is an expectation of some kind of benefit. Without this incentive people tend to avoid, or are reluctant to, communicate. Therefore no blame was attached to the respondents of this Turkish study, but it was suggested that they should try to understand each others conditions and constraints better.

Many other observers may have had similar experiences in developing countries. It is true that if institutions are weak it is almost impossible to establish effective,

operational and sustainable relations. The weakness of the institutions is not only the reason for the inadequate linkage but also is the cause of this phenomenon. It is a vicious circle. The weakness prevents operational linking and this lack of operational linkage fosters weakness.

### Balanced Investment and Synchronized Development

Parallel development of research and extension services is very important in developing countries. There is ample evidence to show that investments in support of either function have been useful only to the extent that the other function could perform simultaneously at an acceptable level of efficiency (World Bank, 1985). Therefore, policy decisions in resource allocation for either instrument should be considered in the context of strengthening the whole system. Evenson (1985) notes that in the 1960s there was an improper balance for resource allocation between extension and research in developing countries. Large extension organizations were created, but they were faced with a scarcity of relevant and proven technology to offer farmers. As a consequence, the question of extension services' credibility has been raised.

## **DIFFERENCES IN ORIENTATION AND VALUES**

### Sense of Mission

The established orientation and values in the research system restrains researchers from a real interest in the application of research findings, and thus discourages linkages with extension. It is not surprising to find many scientists who are more interested in the articles published in prestigious journals as the end product of their research activities than the practical application of these findings

by farmers. Chambers (1985), assesses this behavior as a rational one and says; "scientists like other human beings are motivated by rewards." It is the reward system; professional upgrading and evaluation, prestige, promotion policies and others that take researchers away from an interest in the application of the knowledge which they have generated.

This orientation limits researchers interactions to their research colleagues<sup>1</sup>. The libraries, research information networks initiated by International Research Centers, on-line computer communications, international and national congresses and many other vehicles mostly serve to better tie researchers to researchers. The scope and thrust for research is shaped in this isolation. Several "in vogue" research trends rise and fall, and jargonistic styles emerge and change.

In this context, maximizing yield under optimal conditions becomes the main focus of research activities without taking account of farmers' resource endowment, risk considerations or objectives. The indigenous knowledge of farmers and their experiences is very rarely utilized and capitalized on in the scientific research processes. In addition, the role given to extension workers is a very demeaning one:- "Here is the research result, take it or leave it."

### Common Sense of Mission

Components of the agricultural knowledge system must share a common sense of mission that are centered on the end user, the farmer. Therefore, the generation of knowledge must be paired with a concern for its dissemination and use (Compton, 1989). The farmer should be present at the

starting point of research. A strong service ethic is needed to orient researchers to the application of research results by farmers. Scarce research funds should not be spent for research done merely for the sake of individual preferences and personal career advancement.

Re-evaluation of the reward system in the research world is an urgently required task. The relevance of research work to farmers should become a principal indicator of effectiveness for professional evaluations of the researcher, especially in the field of applied research (Baxter and Thalwitz, 1985). Evaluations must take account of the extent to which research results are adopted by farmers, or at least are used in extension work.

The scientist must be convinced that the time spent with farmers and extension workers will be compensated by, not only personal satisfaction, but also by being an essential criterion in his professional reward system as well. Farm visits, reconnaissance surveys, meeting and training extension workers should be encouraged and given credit.

On the other hand, extension workers often tend to put pressure on researchers for immediate answers, ignoring the long-term nature of research required to generate effective results. This false attitude constitutes a major obstacle to cooperation. Extension workers must therefore be better educated and become more familiar with research procedures.

## **DIFFERENCES IN STATUS**

### Remuneration Policies and Cultural Gap

One of the underlying reasons for poor linkages between research and extension is the very big differences between

the remuneration policies for the staff of these services in the public sector. The salaries and other benefits are much higher for researchers relative to extension workers and the opportunities for professional development and promotion are adversely weighted against the extension service. Consequently the status of the researcher is higher than that of the extensionist. This highly differentiated remuneration policy is the source of strain and tension. This has been called the "cultural gap" (Coulter, 1983) or "socio-psychological factors" (Blanckenburg, 1984) which maintains distance between both sides.

#### Recognition of Distinctive Skills in Equal Importance

The solution to this problem, first of all, requires improvements in qualifications of extension workers, especially for Subject Matter Specialists who are expected to play a major role in organizational linking. According to Evenson (1986), the ratio of research cost to extension cost is 3 to 1 in developed countries while it is 20 to 1 in the low-income developing countries. He explains that some of these differences are due to the real cost involved, for higher expenditures to train researchers, and for the purchase of scientific equipment, but some of this is a quality difference. This implies that extension workers in most industrialized countries have received advanced training, but many have had little training in low-income countries. The "quality" of extension workers should be improved through both short-term training and longer-term investment in skill development. This is necessary, not only to better undertake their professional responsibilities<sup>2</sup> but also to improve linkages with researchers.

For the adjustment of personnel and remuneration policies, it should be recognized that extension and research are equally vital to agricultural development and entail different skills. Proper rewards for these distinctive skills in personnel policies, shared objectives, opportunities for promotion and professional upgrading of appropriate staff are all required.

## LACK OF BUILT-IN MECHANISMS

### Institutionalization of Linking

Effective linking of research and extension cannot be established merely on the basis of personal, informal and occasional contacts between individual researchers and extension workers. It is necessary to institutionalize linking arrangements and to develop built-in mechanisms to maintain this active linkage. Institutional linkages also help foster necessary personal informal contacts.

The separation of research and extension agencies in the administrative structure is an obvious barrier to linkage. But, it is evident that to put them together under the same roof in a ministry or department does not always ensure effective linkages. Built-in mechanisms are needed to safeguard sustainable coordination and cooperation.

Although inadequate in terms of quality, several formal linking arrangements have been tried in developing countries, mostly in the forms of liaison units and joint working committees. The most notable breakthroughs in linking arrangements have been with the Training and Visit (T&V) system on the extension side and Farming Systems Research (FSR) on the research side.

The T&V system considers the "linkages with research" as one of its key features<sup>3</sup> and systematic procedures are envisaged to promote and strengthen the necessary linkages (Benor and Baxter 1984). "Monthly workshops" are used as the main venue of regular contact with extension and research<sup>4</sup>. These workshops aim at providing technical backstopping to extension workers (subject matter specialists) and to form a joint forum where extension recommendations can be discussed and formulated.

Even though important improvements in linking arrangements have been realized by the T&V system, several weaknesses have also been observed in its theoretical framework and practical implementation. The main issues raised in this context were: (a) the lack of a comprehensive understanding of the value of diagnostic studies and surveys, (b) the obscurity of its on-farm adaptive research procedures and methodologies, and (c) the lack of attention for identifying different "recommendation domains" in terms of agro-ecologic and socio-economic characteristics<sup>5</sup>.

In contrast to the T&V system, all these issues are the main considerations in FSR methodology<sup>6</sup>. The participation of extension workers in all the stages of FSR activities has received general agreement in FSR literature (Waugh, et al., 1989). From the extension point of view, this participation plays an important role in determining the output from research. In particular, participation in the technology evaluation processes provides to extensionists first hand experience, and thus confidence, in the technologies which they will be disseminating later on a larger scale.

In practice, the potential of FSR in bridging the gap between research and extension has been well recognized (e.g. Frankenberger, et al., 1989) but could not be fully utilized. There were two inhibiting factors. Firstly, FSR

projects and programs were implemented in a piecemeal fashion in small areas without having long-term strategies. Therefore, FSR has been unable to produce large scale linking arrangements and the institutionalization of their efforts. Secondly, in most cases, extension workers were either ignored or only reluctantly accepted as equal partners in FSR teams.

### From Unilateral Relations to Dynamic Interaction

Institutional linking arrangements cannot be designed to a standard recipe which is valid for every particular situation in different countries. However, the world experience provides an array of options and guidance for principles leading to better linkage arrangements.

Successful institutional linkages are those aimed at changing the conventional roles of researchers-extensionists and farmers in the "agricultural knowledge system." Bunting, (1985) neatly caricatures the conventional roles as; "Big Brother" develops a technology and transmits it through passive intermediates to passive receivers, "the expectant and grateful producers." This unilateral approach has never worked well, is not working now and will not work in the future either.

Institutionalization must be based on dynamic interaction. Extension should have an important role in helping to shape proven technology. This role is acquired not only by becoming committee members but also by taking an active participation in every step in the technology evaluation process.

Unfortunately in this decade, a chance has been missed. The T&V and FSR systems emerged in the same period (in the

mid 1970s) and dominated the literature and practice of agricultural development in their respective fields. But, it is a pity that the importance of integrating FSR methodology in T&V extension procedures and similarly the full integration of extension into FSR, have been recognized as vital only when the movements are beginning to fade (in the mid 1980s). If both sides had not stayed away from each other, and if suggestions for integration (e.g. Denning, 1985) had been seriously considered, then today we would be searching for improvements, rather than seeking alternatives, to the T&V system and FSR.

## **FARMER PARTICIPATION: THE ESSENCE OF PROBLEMS AND SOLUTIONS**

### Raison D'etre and a Dilemma

Research and extension agencies exist and are funded by the public because the farmer exists and he/she has problems to be addressed by these agencies. The fundamental dilemma in most developing countries is that farmers have only an insubstantial voice in determining the scope and output of research and extension.

Although there are rare successful cases in obtaining farmers' active participation (Roling, 1982) the common mode of farmer participation in most developing countries is limited to the appearance of large and influential farmers at meetings. Small farmers are usually only invited in large numbers as backbroud for project launching ceremonies where local politicians and the press are present.

The importance of farmers' influence on research and extension goals is clearly evident in the development of successful agricultural knowledge systems in North America and Europe. Farmers, through their organizations, have in

the long term influenced research and extension institutions (and also other development policies and instruments) in these countries. Swanson et al. (1984) referring to these experiences, has declared: "it is difficult to imagine that an effective technology development, transfer and utilization system can emerge without farmers becoming better organized." Lack of strong and self-managed farmer organizations seems to be a considerable barrier to making research and extension more productive in developing countries.

### The Final Analysis

Farmer participation in, and control over, research and extension is a unique tool to be used for establishing strong linkages between these two development instruments. By participating, farmers will offer indigenous knowledge for incorporation into the scientific pool of knowledge, they will ensure a focus on their real problems and they will keep track of what research and extension staff are doing for them (Cernea, Coulter and Russell, 1985). To solve the problem of linkages and to obtain maximum social benefit from research and extension investment, we must strive to develop mechanisms that allow farmers to fully participate in the decision making and implementation of the technology generation, testing and dissemination process.

## F O O T N O T E S

<sup>1</sup> We can see also a severe isolation within the research system. The isolation of researchers in the boundaries of their respective disciplines or commodity-research areas makes agricultural research even more irrelevant to the realities of actual farm production, especially for small farmers.

<sup>2</sup> Without having a certain level of scientific and technical competence: extension workers can not effectively translate research findings into sound advice to farmers; they cannot analyze and understand farmers problems and they cannot effectively take part in the technology adaptation and verification process.

<sup>3</sup> Other key features of the T&V system are: Professionalism, single line of command, concentration of effort, time-bound work, field and farmer orientation, and regular and continuous training.

<sup>4</sup> The T&V system recommends two more forums where researchers and extensionist can meet. These are Seasonal Zonal Workshops and State Technical Committees. The former one is composed of senior researchers and extensionists from an ecological zone and meets before each production season to review and plan both extension programs and research proposals. The latter committee coordinates and guides the work of research and extension at the national level. Besides these committees, research involvement in the training of extension staff is another way of promoting linkages. Execution of adaptive research activities is an extension responsibility, but for planning and analyzing of results, joint responsibility is suggested. The T&V system

also encourages joint visits of researchers and extensionists to farmer fields.

• The "top-down" approach of the T&V system has been the main focus of critics but is not included, in this list for the sake of limiting the subject to linking issues only.

• Although there are a variety of approaches to FSR, in general the main procedures in FSR methodology as follows: (a) Farmer situation diagnosis, (b) planning and design of technology adaptation, (c) on-farm testing and verification, and (d) dissemination of proven technology.

## B I B L I O G R A P H Y

- Baxter, M. and W. Thalwitz (1985). "National Policies and Institutional Constraints to Linking Research with Extension in Asia" in M.M. Carnea, J.K. Coulter and J.F.A. Russell (eds.) Research-Extension-Farmer: A Two Way Continuum for Agricultural Development. Washington, D.C.: The World Bank.
- Benor, D. and M. Baxter (1984). Training and Visit Extension Washington, D. C.: The World Bank.
- Blankenburg, P. von (1984). Agricultural Extension Systems in some African and Asian Countries. Rome: FAO Economic and Social Development Paper.
- Bunting, A.H. (1986). "Extension and Technical Change" in G.E. Jones (ed.) Investing in Agricultural Extension: Strategies and Goals. London: Elsevier Applied Science Publishers Limited.
- Carnea, M.M., J.K. Coulter and J.F.A. Russell (1985). Research-Extension-Farmer: A Two Way Continuum for Agricultural Development. Washington, D.C.: The World Bank.
- Chambers, R. (1985). "Understanding Professionals: Small Farmers and Scientists" in S.A. Breth (ed.) Essay on Science and Farmers in the Developing World. Arkansas: Winrock International Institute for Agricultural Development.

- Compton, J.L. (1989). "The Integration of Research and Extension" in J.L. Compton (ed.) The Transformation of International Agricultural Research & Development. Boulder: Lynne Rienner Publishers.
- Coulter, J.K. (1983). "The Interdependence of Research and Extension: A Comment" in M.M. Cernea, J.K.Coulter and J.F.A.Russell (eds.) Agricultural Extension by Training and Visit: The Asian Experience. Washington, D.C.: The World Bank.
- Denning, G.L. (1985). "Integrating Agricultural Extension Programs with Farming Systems Research" in M.M. Cernea J.K. Coulter and J.F.A. Russell (eds.) Research Extension Farmer: Two Way Continuum for Agricultural Development. Washington, D.C.: The World Bank.
- Evenson, R.E. (1986). "The Economics of Extension" in G.E. Jones (ed.) Investing in Rural Extension: Strategies and Goals. London: Elsevier Applied Science Publishers.
- Frankenberger, T.R., B.R. Dewalt, H.J. MacArthur, G. Mitawa, R.E. Hudgens, K. Rerkasem, T. Finan, C. B. Flora and N. Young (1989) "Identification of Results of Farming Systems Research and Extension Activities: A Synthesis" FSRE Newsletter, Number 1 (pp. 8-10).
- Roling, N. (1982). "Alternative Approaches in Extension" in G.E. Jones and M.J.Rolls (eds.) Progress in Rural Extension and Community Development Vol.1: Extension and Relative Advantage in Rural Development. Chichester: John Wiley & Sons.

Swanson, B.E., N. Roling and J. Jiggins (1984). "Extension Strategies for Technology Utilization" in B.E. Swanson (ed.) Agricultural Extension: A Reference Manual. Rome: FAO.

Talug, C. (1983). "MEYSEB Tarimsal Yayim Calismalarinin Degerlendirilmesi Uzerine Bir Arastirma (An Evaluative Study on the MEYSEB Extension Program)" Ankara: AU Ziraat Fakultesi, Basilmamis Docentlik Tezi.

Waugh, R.K., P.E. Hildebrand and C.O. Andrew (1984) "Farming Systems Research and Extension" in J. L. Compton (ed.) The Transformation of International Agricultural Research & Development. Boulder: Lynne Rienner Publishers.

World Bank (1985). Agricultural Research and Extension: An Evaluation of The World Bank's Experience. Washington, D.C.: The World Bank.