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ABSTRACT

This overview is composed of four major sections. Part I is a map of agricultural extension's "territory," that is, the definitions and systems. It discusses extension functions in agricultural production institutions and varying institutional settings, describes types of extension systems, and considers farmers' degree of influence on extension systems and multiple extension systems. Part II analyzes national arrangements for extension. A chart presents an overview of national arrangements and compares these with extension system approaches and their relationship to farmers. Public sector and private sector extension are then discussed separately. Part III is a critical review of recent developments relating to extension, including focus on private sector provision, privatization of public extension systems, trend among large farmers to bypass public extension services, research institutions' efforts to provide "frontline extension," development of new designs and mechanisms for linking research and extension, search for participatory methods, and experimentation with hybrid research-extension systems. Part IV recommends four directions or priorities for the future: development policy goals, national arrangements for institutional change, extension agency development, and social science research requirements. (YLB)

AN OVERVIEW OF AGRICULTURAL EXTENSION SYSTEMS:

THE TERRITORY, RECENT DEVELOPMENTS AND RECOMMENDED DIRECTIONS

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Paper presented at the IFAD Seminar on "Generation and Transfer of Technology for Poor Small Farmers: Issues and Options," held in Seoul, Korea in June 1988.

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This overview of agricultural extension systems is composed of four major sections: (1) a map of extension's "territory," that is, the definitions and systems; (2) an analysis of national arrangements for extension, and (3) a critical review of recent developments relating to extension. In conclusion, (4) a number of new directions are recommended.

EXTENSION DEFINITIONS AND SYSTEMS

Extension Definitions

Overviews and comparisons of agricultural extension systems are useful for at least four reasons: (a) the academic value of such comparisons, (b) their value in administrative decision making, (c) their relevance to policymakers, and (d) their ultimate benefits for farmers and the rural community. Comparative

analysis helps disaggregate the various factors which complicate discussion of extension systems. These include the following: (1) varying concepts, definitions and terms, (2) the interdependencies of the extension sub-system with other sub-systems in the agricultural development process, (3) the variety and multiplicity of systems, (4) the complexity of key internal and external factors that influence the success of extension, and (5) the lack of available program and economic data on extension.

These factors have been discussed in detail elsewhere (Rivera, Seepersad & Pletsch, 1988), but the varying definitions of extension require review. There are at least three definitions of agricultural extension: (i) Agricultural Performance (extension viewed only in terms of improving production and profitability of farmers); (ii) Rural Community Development (extension viewed as serving to advance rural communities, including improvement of their agricultural development tasks); and (iii) Comprehensive Nonformal Continuing and Community Education (extension viewed as provider of nonformal agriculturally related continuing education for multiple audiences: farmers, spouses, youth, community, urban horticulturalists).

In some cases, as with the U.S. Cooperative Extension and the Canadian Extension systems, all three orientations operate within one extension organization. In third world developing countries, however, most systems tend to adhere more strictly to

agricultural production services. Indeed, the current tendency among policymakers internationally is to view extension narrowly as the enhancement of the flow of knowledge between research and farmer--in brief, technology transfer.

Extension Functions and Purpose in Agricultural Production Institutions

Definitions of extension are often based on the operations of particular national extension systems. These definitions reflect the organizational choices that are made as a result of what the functions are that the extension system is asked to perform. Thus, our assumptions about extension's functions shape our definition. While the main function of agricultural extension is generally thought to be the enhancement through nonformal educational means the communication of practical knowledge on agriculture and rural development, analysts have interpreted this function in ways that specify their different perspectives on extension and the purposes they assign to extension.

For some, its purpose is to deliver technology, pure and simple. Others would broaden its functions to include educational delivery and problem solving. Still others would add feedback, and involvement in adaptive research as well. Some would argue that extension should also provide "institutional

"echnology," helping farmers to organize into associations and other forms of cooperative activity.

Information delivery flows through many channels of communication from the extension service to clientele. These include radio transmission, video, bulletins, etc. This function implies the employment of agricultural information specialists (AISs) as well as agents, or village extension workers (VEWs).

Educational program delivery involves the preparation of nonformal or informal educational programs which are then delivered by extension specialists and agents to upgrade the knowledge, skills and attitudes of clientele. Again, the agent is seen as partially dependent for support on other individuals, often subject-matter specialists (SMSs).

Problem-solving refers to to the expertise, knowledge, and skills needed to solve individual and group problems arising on farms or ranches and in farm homes and families. In this instance, the agent is assumed to be a professional--well trained in farm management and therefore able to engage in more than technology message delivery.

Information feedback is a problematic function, one which is discussed more than actualized. This function requires in part that agents listen to farmers about their needs and reactions to

new practices and technologies and report on these needs and reactions to their superiors as well as to researchers. It implies that agents will become engaged in diagnosis of farmer needs. In Brazil's Northeastern provinces, Rio Grande do Norte and Piaui, a "convergence" extension project has been put into place. Its main activities are the on-going evaluation and follow-up systems of the results of agriculture, social, and farmers' organization activities--aiming to improve the living conditions of small farmers and their families (Rogers & Calvalcanti, 1985). Agents in this project are trained specifically in diagnostic techniques.

Adaptive research is another currently controversial responsibility seen as part of extension's function. Should extension agents be assigned to engage in adaptive research projects--and should, therefore, researchers be instructed to include agents when adaptive research is undertaken? Is involvement in adaptive research one of extension's functions? Certainly, this function is not only crucial but supports those involving dissemination of information, knowledge and problem-solving. Indeed, it contributes to the professionalization of extension services. This position will be reaffirmed later in the section on Recommended Directions.

Finally, there is the question of extension's role in promoting institutional technology among farmers and rural

workers, that is, helping them to learn to organize themselves into associations and other forms of cooperative endeavor. The success of farmer associations in developing agricultural production in Taiwan and the importance of the nation-wide agricultural cooperative federation in Korea are reasons for wanting to include organizational skills as part of the agenda for extension. There is no agreement, however, as to the ways in which extension should function--only that its function is a significant part of the agricultural development process.

The Extension Function in Varying Institutional Settings

Many assume that agricultural extension in developing countries is the responsibility of the Ministry of Agriculture. In reality, there are a variety of institutional settings that incorporate some or all extension-type functions.

An examination of different agricultural institutional settings shows that extension-type functions may be (1) primary to an agency or organization, as with the agricultural extension service; secondary, as with private firms and cooperatives; or supportive, as with credit institutions, supply agencies, and marketing agencies. An incipient literature is developing on extension-type activities in different agricultural institutional settings, such as "marketing extension" (Narayanan, 1986).

Types of Extension Systems

Several authors have typologized extension systems (Chambers & Oxenham, 1978; Orivel, 1981; Pickering, 1987; Ray, 1985; Weidemann, 1987; and others), but there are contradictions among the typologies and some confusion of terms. Pickering differentiates the following systems: the commodity-focused approach in extension (designed to facilitate the production of a single crop); the community development-cum-extension approach (incorporating a broad definition of the functions of the extension agent which tends to dilute the agent's specific agricultural extension responsibility); the technical innovation-centered approach (set up to transfer technology from 'outside' to the farm, sometimes specifically to 'sell' a number of technical innovations); the training and visit system approach (organized to serve the farmer by mobilizing the extension system, as well as its linkage with the research system, through regularity of agent visits to farmers and regularity of agent training); the 'animation rurale' approach (associated with francophone Africa, this approach involves participatory rural development with specialists working directly with small farmers to develop, test and demonstrate improved agricultural technology.

Weidemann (1987) enumerates a similar although distinct set of "models for extension delivery." These models include: 1. Conventional Agricultural Extension; 2. Training and Visit (T&V)

System; 3. University-Organized Agricultural Extension; 4. Commodity Development and Production System; 5. Integrated Agricultural Development Programs; 6. Integrated Rural Development Programs; 7. Farming Systems Research and Extension.

Ray (1985, drawing on Orivel, 1981) identities three categories which he labels as models: the directive (top-down delivery systems), the participatory (systems involving farmer participation), and the contractual (systems where farmers contract directly with public agencies or private companies to receive extension services). He then recommends a fourth: the hybrid. According to Ray, elements of the first three need to be incorporated into a hybrid model. We return to the concept and practice of hybridization in the section on Recent Developments.

Lele (1975, citing Ruthenberg, 1973) places extension broadly under two major rubrics: the "take it or leave it" approach where farmers are free to accept or reject development innovations and the "contract farming" approach. In the latter approach, farmers agree to adopt innovations: they are granted a license to produce certain commodities on the condition that they use a particular innovation and follow project guidelines set down by the extension organization.

Chambers and Oxenham (1978, and in Orivel, 1981) draw attention to another approach. They categorize extension systems

according to "representative participation"--the touchstone of the Taiwanese farm information dissemination system (FIDS) where both local government and farmer associations are involved in controlling the system. Axinn (1987) goes even further, categorizing approaches by point of control: the "delivery" approach (top-down, supervisory, supply-driven) and the "acquisition" (bottom-up, farmer-determined, participatory, demand-driven) approach.

In the following analysis based partially on the above, we arrive at a classification of four basic approaches to extension. These are then illustrated by different sets of extension systems and type of relationship to farmers. This analysis is illustrated in the following Figure 1.

FIGURE 1

SYSTEM APPROACHES	TYPES OF SYSTEMS	RELATIONSHIPS TO FARMERS
I Top-down "Delivery" Services	-- Conventional T & V System University-Organized Technical Innovation Integrated Agricultural Development Programs	-- Take it or Leave it
II Participatory "Acquisition" Systems	-- Farm Information Dissemination System (Taiwan) FSR/D (Farming Systems Research & Development)	-- Take it or Demand Different Packages (or Programs)
III "Contract Farming" Systems	-- Commodity Development & Production Commodity-focused	-- Take it or Else
IV Rural Development/Extension Approaches	-- Community Development-cum-extension 'Animation Rurale' Integrated Rural Development Programs	-- Take it or Turn Away

Figure 1 highlights four major agricultural extension approaches. As this paper is concerned primarily with production extension systems, discussion of top-down delivery services, participatory acquisition systems and contract farming systems is most germane. While valuable for information dissemination, rural development approaches usually have purposes in mind beyond that of agricultural extension.

Figure 1 also suggests basic relationships of approaches and systems to farmers. With the top-down delivery services, farmers may or may not adopt the technology or information dissemination. Farmers may, as Lele states, take the information proffered or leave it. Indeed, research shows that it is one thing to become informed about an innovation and quite another to come convinced of its utility (Katz, 1961; Rogers and Shoemaker, 1971). In participatory acquisition systems farmers have influence over extension delivery. This approach has a particular virtue--indeed, it may be called the "take it or demand different packages, or programs" approach. In the contract farming systems approach, farmers must take the information, or lose their contract, i.e., take it or else. In some cases they may be fined.

Farmers' Degree of Influence on Extension Systems

To discuss the question of degree of farmer influence on extension raises questions of power and control. Should farmers'

associations have control, or at least some influence, over public extension activities? Should the goal of sustainable development include client influence over extension systems?

Figure 2 reviews selected extension systems categorized by the extent to which farmers are involved in the decisionmaking process of the system. The column on the left distinguishes extension systems as to whether they are delivery services (whether strictly production oriented or broad-based in scope), participatory, or contract farming commodity-based systems. The degree of farmer participation in decisionmaking in any one of these systems is then categorized as high, medium or low.

FIGURE 2

DEGREE OF FARMER INFLUENCE ON EXTENSION SYSTEMS

Type of System	Degree of Farmer Partic. ation in Decisionmaking: HIGH	MEDIUM	LOW
	State/farmer funded and supervised	Representative participation	Supervisory "top-down" systems
Delivery (both production only & broad-based programs)		Cooperative Extension System (U.S.)	IRDP (India)
		Training and Visit System.	
Participatory	Farm Info. Dissemination System (Taiwan)	Farming Systems Research and Development	
Contract farming			Commodity Production Systems (Pub/Priv)
			CFDT-type (W. Africa)

Figure 2 might be considerably expanded. At best, it serves to suggest the degree of farmer participation (or lack thereof) in decisionmaking in certain selected extension systems. Indeed, we note that the highest degree of farmer influence is in the Taiwanese FIDS (Farm Information Dissemination System) where farmer associations are strong. Client involvement and influence over the systems that serve them is an important ingredient in long-term, committed development.

Multiple Extension Systems

In discussions of production extension systems a frequent assumption is that there is one unified extension system. This is not usually the case; indeed, it must be noted that there are more often multiple systems of agricultural extension within the same country, employed by a variety of agencies and programs. Production extension services may exist independently for crop, livestock, forestry and other agricultural products.

Rarely is only one agency in charge of all production extension activities in a country--patterns differ from country to country. In many of the English-speaking Caribbean countries, separate divisions exist for provision of livestock and crops services.

Indeed, agencies other than the Ministry of Agriculture are normally responsible for export crops, such as tea, cocoa, coffee, rubber and coconut. Research, extension and training for a single commodity are usually based either in a separate Ministry or in an export-oriented board. Thus, we see that various agencies may be responsible even for production extension.

A different organizational pattern prevails in some West African countries previously under French colonial rule. In these cases, the Ministry of Agriculture is responsible for planning and coordinating agricultural development, maintains only a few central services (administration, staff training, etc.), and gives responsibility for research and extension to parastatal organizations or special project implementation units that often operate free of central government regulations concerning personnel recruitment, contracting, budgeting, procurement and other matters.

The preceding discussion points up that extension systems are often not only multiple <u>within</u> the public sector but include other, separate services <u>outside</u> the public sector carried on by the private sector. While some specialists (Benor, Harrison & Baxter, 1984) argue for unified production extension systems--at least within the public sector, it is nevertheless obvious that agricultural extension in the public sector is generally multiple

and in its entirely involves a conglomerate of enterprises (including public and private). An overview of extension systems within individual countries shows that these systems are arranged differently, although certain patterns may be observed.

NATIONAL ARRANGEMENTS OF AGRICULTURAL EXTENSION SERVICES

Among the reasons for this paper, as suggested at the beginning, is to help with administrative decision making and thus be relevant to policymakers. The following examination provides a broad vista which is intended to be useful in understanding the challenges that face policy decisionmakers concerned with improving and/or changing national arrangements for extension.

Figure 3 presents an overview of national arrangements, combining these with extension system approaches and their relationship to farmers already illustrated in Figures 1 and 2. It sets the stage for later discussion of recent developments surrounding extension.

FIGURE 3

National Arrangements, System Approaches and Their Relationships with Farmers--

	NATL. ARRANGEMENTS	SYSTEM APPROACHES	RELATIONSHIPS WITH FARMERS
PUBLIC	1. MIN/AG (Field Services)	DELIVERY SERVICE (Non-compulsory) 1	Take it or leave it
DUAL	2. MIN/AG and FARMERS ASSN. (Dual Control over extension services)		
CORPORATE	3. MIN/AG (Parastatal) May be public created or private inst.	PARTICIPATORY (Shared Responsibility) 2, 4b & 4c	Take it or demand new package (or program)
PRIVATE	4. PRIVATE 4.a. For Profit --Domestic E's --Coops. --MNE's 4.b. Membership --Farm Assns. 4.c. Non-Profit --NGO's	CONTRACT FARMING (Compulsory) 3 & 4a	Take it or else

Figure 3, along with Figures 1 and 2, provides a working map of the extension "territory,"--its approaches and systems and their farmer relationships, as well as national arrangements of extension. What is needed now, but lacking, is to know the relative effectiveness of each of these arrangements.

Public Sector Extension--Primacy of the Ministry of Agriculture

At least three distinct government arrangements of the main (production-oriented) public extension agencies in Africa and Asia have been identified. These are the sectoral governmental service type; the subsectoral parastatal intervention type; and the unified service with mobilization of local resources type (Blanckenberg, 1984). Notable in each of these types is the primacy of the Ministry of Agriculture.

In essence, these three arrangements operate either under the aegis or in close connection with government ministries of agriculture. However, it should be noted that in Latin America, for instance, single-commodity producer associations concerned with high-value export crops (e.g., coffee, bananas, and out-of-season perishables such as vegetables), operate on their own authority albeit with government support.

Sectoral governmental service. Two sub-types are distinguished in this category: the department of agriculture (DOA)

type in which the DOA operates extension field services under the aegis of the Ministry of Agriculture, and "other"--where the extension organization comes directly under the Ministry of Agriculture or is situated within another ministry. The sectoral government service type is the most common arrangement in African and Asian countries and is usually the type referred as "conventional" or "traditional" extension.

Subsectoral parastatal intervention. In this type of agricultural extension service, the MOA contracts with a parastatal(s). The focus is on one or a few commercial crops. Found in West Africa in countries formerly under French colonial rule, these parastatal societies are built on the CFDT model (Compagnie francaise de developpemente textile) and currently include a host of production societies (e.g., CIDT, SATMACI, SODEPALM, SODESUCRE, etc.). They generally have a high degree of autonomy and are responsible to the Ministry of Agriculture which limits its concerns to overall planning, coordination and regulatory work.

Unified service with mobilization of local resources. This type of public sector rural development and extension organization has developed in Korea and Taiwan. Its characteristics include: (i) mobilization of resources at the local and regional level; (ii) strictly decentralized extension programming; and

(iii) development work entrusted exclusively or almost exclusively to one service (op. cit., Blanckenberg).

In Taiwan, the extension system depends on the central Department of Agriculture and Forestry and operates a number of Agricultural Improvement Stations. Extension work, however, is primarily organized by farmers' associations which wield considerable influence. These associations carry out purchase, sale and banking functions as well as extension responsibilities, with the objectives of improving the situation of the farming population and developing the rural economy.

Private Sector Extension--For Profit and Non-profit

In developing countries, extension functions are carried out by a diversity of private enterprises. These structures are of essentially three varieties: (i) for profit, including domestic enterprises--large farm estates, domestic firms, and cooperatives--and multi-national enterprises (MNEs) and their subsidiaries; (ii) membership associations, e.g., farmers associations, and (iii) non-profit organizations, e.g., the NGOs. Domestic and multi-national firms, despite certain differences, share a common market orientation: they all seek to make a profit by selling goods and services. Membership associations share an interest in profit-making but are not set up for that purpose. NGOs, in general, are non-profit.

For Profit: Large Farm Estates and Domestic companies. Large farm estates and domestic companies dominate agriculture in most developing countries. They involve relatively smaller commercial enterprises and lack the level of management capacity common to larger corporations, such as the multi-national enterprises (MNEs) and their subsidiaries. These domestic operations include a wide variety of agricultural production, supply and marketing organizations. All of them are commercially oriented, concerned with major commodities and highly profitable situations.

A common feature of these and other agribusiness operations is contract farming, although it has become a variant within public sector services as well. Contract farming is generally limited to high-value cash crops like coffee, tea, cacao, sugar, tobacco and cotton, and involves technical extension or technology transfer. In the interest of maintaining a constant supply of quality products, corporations provide a "package" of services including improved seeds, fertilizers, pesticides, mechanical services, and a large staff of technicians for in-field supervision of farmers. As part of the contractual relationship, farmers are obligated to accept extension recommendations.

With the recent shift in interest toward private sector development, international and domestic agricultural producers

have become of particular interest to governments and international organizations. Indeed, some countries have favored privatization and others have enhanced public-private coordination of agricultural activities, including extension.

For Profit: Cooperatives. Agricultural cooperatives are share-holding, private bodies. They help their shareholders to acquire new knowledge and skills which can be used to increase agricultural productivity. The quality of extension work is usually higher than in national extension services since high-value crops make it possible for cooperatives to pay better salaries and hire top-level technicians.

In cooperatives where hierarchical social and economic relationships of the patronage system exist, egalitarian functioning is severely limited. Thus, it may be a mistake to hold inflated expectations that cooperatives will instantaneously bring about rural development. Nevertheless, cooperatives and their important extension function represent an important contribution to the gradual development of group organization and empowerment of rural communities in low income as well as more developed countries.

For Profit: Multi-National Enterprises. Multi-national enterprises (MNEs) operate in one of two ways, as do domestic firms. They may act independently of the public sector

production system or serve as parastatals for the public sector--as with the CFDT-type arrangements in West Africa.

Many governments decentralize their planning, decision making and management functions through the parastatal arrangement. In such cases the Ministry of Agriculture delegates[1] responsibility to an international or domestic company that undertakes, inter alia, the extension functions.

Parastatal companies, such as the KTDA (Kenya Tea Development Authority and the Sudan Gezira cotton project, as well as the West Africa CFDT-type companies, are often based on contract farming with 'compulsory' extension. Non-performing farmers (those who do not adopt cultivation specifications) are excluded. This undoubtedly contributes a great deal to the high rates of new technology adoption, but farmers relinquish a certain flexibility as well as the ability to respond to changing markets through diversification. Moreover, because the producers pay for the services, there is a climate of "perform or else."

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1. Rondinelli, in Rivera & Schram (1987), distinguishes four forms of decentralization: (1) deconcentration--transfer of functions from within the central government hierarchy to field officers, the creation of field agencies, or the shifting of responsibility to local administrative units; (2) delegation--transfer of functions to regional or functional development authorities, parastatal organizations, or special project implementation units; (3) devolution--transfer of functions to legally incorporated local governments; and (4) transfer to non-governmental institutions--shifting responsibilities to private or quasi-private organizations that are not part of the government structure.

Non-Profit: Membership Associations. Farmer associations are membership organizations, financed by fees from members. They differ from cooperatives, where members are share-holders. In some cases, as in Korea and Taiwan, farmer associations serve as a partner in the process of agricultural development--participants in decisions involving the implementation of adaptive research as well as field extension activities.

Farmer associations, along with domestic enterprises and cooperatives represent major local resources. Policies to mobilize these resources indicate in part the extent that the country and its culture can permit farmer control, as well as the extent to which the philosophy of the national arrangement is geared to farmer independence and ewducation for self-reliance. It also raise questions which touch on a country's short-term and long-term extension priorities. Is the first priority to develop a country's production or its institutional capacity? Should public extension services be concerned about transferring "production technology" or "institution technology"--that is, should extension be concerned with transferring to farmers knowledge about institutional development or should they continue with efforts to provide technology innovations? These questions will be addressed later.

Non-Profit: The Role of the NGO's. Non-governmental organizations have a special role to play in developing

countries. They do not have the financial resources nor the staff to compare with governments, international organizations or private companies. What they do have, however, are vital human resources, usually young people willing to take on the difficult and sensitive task of working with rural communities at the base level. International officials continually refer to the role of NGO's in assisting marginal and subsistence farmers and in providing help with basic needs among rural populations. Important work is being carried out, especially in disadvantaged areas, by NGOs. Unfortunately, these rural development extension activities tend to lack continuity.

RECENT DEVELOPMENTS

Recent developments indicate a new environment of questioning and exploration regarding extension systems and the transfer of knowledge. These include: (1) the focus on private sector provision, (2) the privatization of certain public extension systems, (3) the trend among large farmers to "by-pass" public extension services, (4) the effort by certain research institutions to provide what has been referred to as "frontline extension," (5) the development of new designs and mechanisms for linking research and extension, (6) the search for participatory methods, and (7) the experimentation with hybrid research/-extension systems.

These developments reflect concern with three major sets of questions: (a) the control and purpose of agricultural extension (i.e., its ownership and orientation), (b) the "right mix" of extension systems for clientele conditions (i.e., public, private and mixed-type systems), and (c) the measures for improving systems so as to dynamize the extension process (i.e., questions of how to change systems for the better--e.g., whether thrcugh structural reform or functional improvements).

What is the problem? Do public extension systems require major changes, or would managerial improvements suffice? That is, do recent developments suggest the need for functional improvement of public systems or structural change?

Which is the first priority--extension system development or farmer organization? Is the question one of transferring "production technology" or "institution technology?" That is, should extension be concerned with transferring to farmers knowledge about institutional development or should they continue with efforts to provide technology innovations?

What is the main concern? Are adoption rates the prime consideration? Or, is participation in, and influence on, the agricultural development process--including the research and extension institutions--the main concern?

Which extension systems work best? What are the best organizational structures for promoting equitable, progressive development in third world countries? What are the best managerial modalities for service delivery? Should systems--and their training programs--be distinguished according to whether they promote message delivery, offer farm management services or assess and diagnose needs?

Which national arrangements work best? Should the Ministry of Agriculture provide extension field services? If so, should it provide the services in conjunction with farmer associations? If not, should it delegate responsibility to a parastatal? Or, should it privatize the public system--thereby becoming a fee-based service or transferring the extension services to private farmers associations while maintaining only regulatory functions? Or should there be a mix of public and private extension services, with each sector serving different clientele?

These are a few of the questions confronting policymakers and others concerned with agricultural extension and the best means of fulfilling its function. They are expressive of the search for new answers. The following discussion reviews recent developments in light of these questions.

The Focus on Private Sector Provision

Public sector extension, although not without some success, has generally been dis ppointing in transferring improved technologies from research to the farmer in less developed countries (Rodgers, 1987). Extension institutions and programs exist in virtually every developed and developing countries and yet, in the latter, the coverage of farm families is still limited. As well, the effectiveness of government extension services as a viable technology diffusion method has been seriously questioned by developed countries and donor agencies.

Private sector extension is one alternative to the typical, or conventional public agricultural extension system. It is a diverse sector consisting of individual farm enterprises of all sizes, agricultural input industries, agro-service enterprises, processing industries, marketing firms, and multinational corporations or their subsidiaries, as well as cooperatives. The latter should not be overlooked in planning national arrangements for extension.

In examining the private sector, a recent study (USAID, 1985) concludes that public, private and mixed delivery systems each have advantages in particular situations: (1) Public institutions are preferable when benefits are diffuse, public policies need changing and/or increased economic equity is a

primary goal; (2) Mixed public/private entities work best when agricultural services not only require intensive, responsive and flexible management, but also need political influence to achieve program objectives; and (3) Strictly private firms perform best when flexible management and direct and continuing interaction with farmers are needed.

This same study concludes that private sector extension can serve as an important supplement to government extension systems for certain groups of producers under certain circumstances. However, private firms cannot substitute for public agencies when the policy and regulatory environment is poor, when target populations are remote, when infrastructure is lacking, and when production is mainly basic food commodities grown by subsistence farmers.

The Privatizing of Public Extension Systems

Some countries are moving quickly toward complete privatization of extension, as in The Netherlands and New Zealand. However, it may be too soon to promote such a move in developing countries. Public sector services are critically important in the rural areas of many developing countries--for agricultural but also rural development. Private sector organizations can play a predominant extension role for instance for particular inputs, particular outputs (i.e. commercial crops

and commodities) and for particular farmers in particular areas. But again, in most cases the private sector extension services cannot and should not be seen as a substitute for public extension, for the reasons already mentioned.

The By-Passing of Public Extension Systems

In countries such as the United States and Canada, large and highly specialized farmers often by-pass agricultural production extension services and go directly to universities or research agencies to obtain farm management information. This has caused critics and policymakers to question the need for a public grass-roots based extension function at all. Ironically, however, this would appear to highlight the need for public extension services, since it is less feasible for middle and small farmers to contact researchers or take advantage of private sources of knowledge.

Some suggest[2] that such by-passing of extension is part of the natural evolution of the changing importance of extension and research at different knowledge levels. Figure 4 illustrates this suggested correlation.

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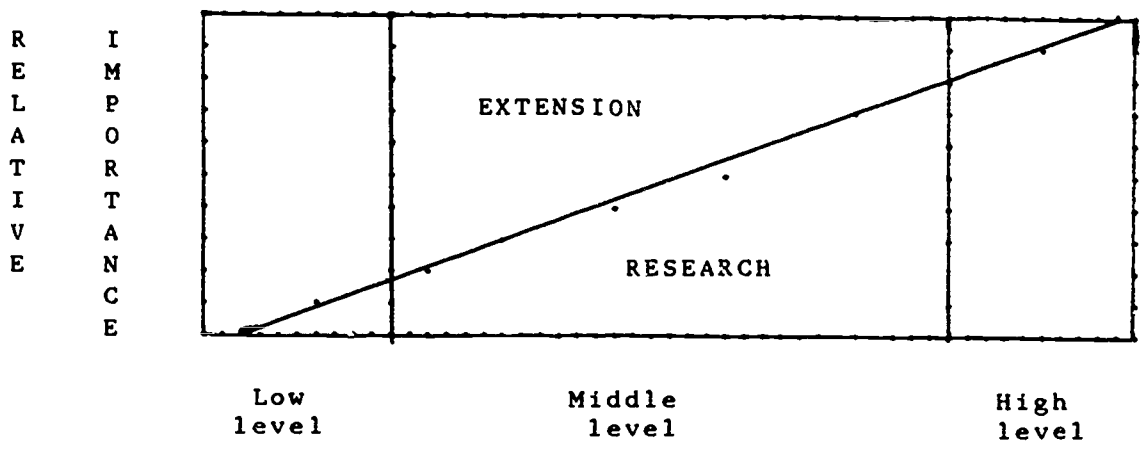
2. Dr. Joao Barbosa, World Bank staff in Recife, Brazil, developed the original sketch, which is reflected in Figure 4.

FIGURE 4

RELATIVE IMPORTANCE OF EXTENSION AND RESEARCH
AT DIFFERENT KNOWLEDGE LEVELS



We would argue that Figure 4 is based on a false hypothesis, and is operative only in certain cases. In reality, extension services are continually important even to educated farmers with expert knowledge. On the other hand, research often proves to be of immediate importance even to farmers with low knowledge levels.

Research Services for Extension: "Frontline Extension"

In some cases, the extension function is integrated into research organizations. One example is India's "Lab to Land" program--an outgrowth of the Indian Council of Agricultural Research (Prasad, 1985). Prasad refers to the direct training and

advice provided farmers by the ICAR/Agricultural University-assisted KVK Farm Science Centers in India as "frontline extension," that is, extension information and knowledge provided directly from research specialists to farmers.

Thus, we see that there is a role for research in training farmers--those who can manage to travel to the research centers and can afford the time and expense away from their farms. This contribution, however, appears to be supplemental to, and not a substitute for other extension services--public and private--involved in providing broad-based, direct delivery and problem-solving services.

New Designs for Linking Research and Extension

In some small countries (e.g., Barbados) with low numbers of extension and research staff, agricultural extension is integrated with research in an effort to maximize the use of existing human resources. In other countries--e.g., Chile and to some extent in Argentina--extension and research operate from within the same institution, with advisory committees overseeing the management of their linkage.

Evaluation of these new designs and mechanisms for linking extension and research is not complete. However, such

experimentation is a welcome change from the too often isolated efforts of these funtionally interdependent institutions.

The Search for Participatory Methods

The Overseas Development Institute (ODI, London), in particular, has taken an interest in what the degree of farmer participation in research and extension. They refer to conventional models of agricultural research and extension as "characterised by direct transfer of technologies developed on-station to the farmer" and "unlikely to produce technologies suited to the diverse, complex and risk-prone environments in which many LDC farmers are located." According to ODI, this has led to "numerous efforts to develop alternative, more participatory approaches."

The FSR/D (Farming Systems Research and Development) approach--recently altered to the FSR/E (Farming Systems Research and Extension) approach--is supported by the USAID. It has encouraged great expectations that have yet to be realized, in part because of the lack of a true extension component other than the "ripple effect."

According to ODI, "the problem is how to spread the costs of participatory research over a larger number of clients without detriment to the high degree of relevance achieved through

participatory approaches." This statement is a contradiction in terms. The promise of FSR/D is "high degree of relevance" which by implication requires individualized, adaptive research. To "spread the costs of participatory research" implies that FSR would no longer be individualized and participatory!

The "Hybrid" Approach

Various authors (Denning, 1983, 1985; Moris, 1987; Ray, 1985) consider the "hybrid" approach to be best suited to meet today's and tomorrow's research/extension needs. Denning initially proposed the possibility of integrating farming systems research with T&V-type agricultural extension systems (1983). Moris also discusses a possible hybrid composed of the "top-down" T&V system and the more "bottom-up" Farming Systems Research (FSR) system[3].

According to Moris, hybrid management systems (such as the proposed merger of T&V and FSR/D systems) may yet become "the breakthrough in extension productivity for which resource starved third world extension agencies have been searching" (p. 222). According to Seepersad, the hybrid model has already been used

[3]. The FSR/D, according to Shaner, Philipp, & Schmehl (1982) is an on-farm research and development approach to farming systems which comprises the following tasks: (1) site selection--target and research area selection; (2) diagnosis--problem identification and development of the research base; (3) design--planning on-farm research; (4) research--on-farm research and analysis; and (5) extension--extension of results.

with positive results in the Caribbean Agricultural Extension Project (CAEP).[4]

A hybrid, however, is formed by taking two independent, diverse, distinct varieties each of which has its own rational existence prior to hybridization. Critically and essentially extension and FSR should not have independent existences. On the contrary, FSR is the adaptive aspect of research with which extension should be involved. Therefore, the term "hybrid" is misleading. While this point may seem subtle, it is important because the assumption underlying the hybrid proposal is that extension is not conceived of as being involved in adaptive research efforts. Herein lies one of the major problems in discussing extension, and it reminds us that involvement in adaptive research efforts is not necesessarily considered an extension function. And yet, we know that technology is more likely to be appropriate and therefore adopted when adaptive research is carried out on-farm by researchers and extensionists together in a cooperative mode.

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[4]. CAEP, funded by USAID and administered jointly by the University of West Indies (UWI) and MUCIA (Midwest Universities Consortium for International Activities, uses multi-disciplinary teams to conduct Rapid Reconnaisance Surveys or "sondeos"--a technique associated with FSR/D. Such surveys were completed for seven countries in 1986 and out of these emerged various recommendations, including one to merge FSR with T&V-type extension.

RECOMMENDED DIRECTIONS

This last section recommends four directions, or priorities, for the future. They fall under the headings of (1) development policy goals, (2) national arrangements for institutional change, (3) extension agency development, and (4) social science research requirements.

I. Clarify Policy Strategies for Agricultural and Research/Extension Development

What is sorely needed is vision at the top--clear views of national strategies for development and the interconnectedness of overall, regional and sectoral goals. Only then can there be the national will to advance with purpose. Agriculture is crucial to all countries--to the developing and newly industrialized as well as high-income countries. Does policy reflect this? How? Are research and extension seen to have mutual goals--while at the same time recognizing that they may individually embrace separate professional responsibilities?

Government must also recognize the need for continual upgrading of senior-level officials' management skills. This priority cannot be left to the extension agency since senior-level officials will not fall under its authority. Such a

mandate must come from the highest level--as in India, from the President.

In 1985 in India, an effort was initiated to create a national center for agricultural extension management which would cater only to senior-level management, including extension directors and also secretaries in the state departments of agriculture responsible for budgets and policy. This meant developing a combined management training program--one which would acquaint program participants with extension service delivery problems but at the same time deepen their knowledge of organizational management procedures as these relate to the development of extension systems.

There is a need for agricultural extension management training at all levels (Venkataraman, 1986; Rivera, 1987). This is a priority especially for top officials--commissioners and secretaries who operate at the policy and budget levels--as well as directors of extension. It is important for policymakers to become more cognizant of the realities of the farmer and the extension grassroots and middle management officers serving farmers, and of the complex management skills required to make extension's effort at knowledge dissemination for agricultural production more successful.

II. Develop the "Right Mix" of National Arrangements for Research/Extension Development

Also, at the highest level determinations must be made as to "the right mix" of production development organizations, public and private, and the role of each as well as coordination between them. Drawing on Figure 3 herein, what is the best arrangement to enhance in particular the development of research and extension? Is public system cost-recovery possible? Most importantly, how can these arrangements be made so as to mobilize local resources and develop them (i.e., domestic enterprises, cooperatives, farmer associations)?

The development of local resources should be a major priority for all countries, but especially those considered to be the least or less developed since they must begin to seek to gain world-market strength through some comparative advantage over the long-term. While government may not wish to intervene directly in the development of cooperatives and farmer associations, it may do so through extension services.

While governments may be attracted by the idea of rapid agricultural development by multi-national private sector enterprises (MNEs), in the long run it will be the domestic domain, including the grassroots level, that must develop. The mobilization of local resources along with local government in developing

extension has been shown to be effective socially and economically in countries such as Korea and Taiwan.

Extension services controlled by unified government/farmer associations (viz., by mobilization of local resources) is a type of public sector rural development and extension organization which has developed in two far-eastern countries: Korea and Taiwan. While the services in these two countries differ in some respects they share certain characteristics: (i) mobilization of resources at the local and regional level; (ii) strictly decentralized extension programming; and (iii) development work entrusted exclusively or almost exclusively to one service.

In Taiwan, the government service depends on the central Department of Agriculture and Forestry and operates a number of Agricultural Improvement Stations. The main extension work, however, is organized by the farmers' associations which are cooperative organizations of considerable influence in rural development. These associations carry out purchase, sale and banking functions as well as extension responsibilities, with the objectives of improving the situation of the farming population and developing the rural economy.

This unified service mobilizes farmers to participate in the operation of the extension service and represents a form of joint system under the responsibility of both government and farmer

associations. Lionberger and Chang (1981) cogently argue that the latter arrangement may hold out the best alternative for equitable, progressive development in third world countries.

3. Promote Extension Agency Development

Public extension has suffered continuing attack and for reasons that in some cases its services are moribund or inefficient. Extension must, as has been the case in many developed countries, (a) re-define its strategy and goals (based on national priorities), (b) develop its staff through management and program training--with clarify as to what these skills should be, based on its purposes), (c) insure that program operations amount to at least 15-20% of the budget, (d) provide incentive systems to encourage motivation among staff, (e) provide hardware and software for agents (in some cases, this will include housing as well as transportation facilities and audio-visual materials), and (f) support for farmer involvement in program development and evaluation.

To date, most management training courses and workshops have been targeted toward agents and mid-level management. These have included senior-level extension directors and assistant directors, but the management training has focused on "service management," not "organization management," relevant to extension.

Support for farmer involvement in extension and research is also an important priority. A participatory approach to extension may be the most equitable and efficient in the long run. It recognizes that planners and technocrats may not have sufficient familiary with the highly diverse agricultural needs, constraints and potential in every region and sub-region in the country to enable them to design sustainable national programs appropriate to all farmers and regions. Thus, farmers are viewed as participants in decision-making, rather than passive recipients.

The degree of farmer influence on extension is a major question. Should farmers associations, as in the cases of Korea and Taiwan, control extension activities? Certainly farmers should have some say-so over the systems that presume to serve them. While it may be too much to ask that extension take on the burden of promoting democracy, it is a tool, or set of functions, that may enhance democratic mechanisms--such as the "ovelapping authority" structure of systems in Taiwan, Korea, and the United States.

4. Support Social Science Research Requirements

Finally, there is a critical need for data collection, comparative study and evaluations in agricultural extension. Ideally, both program effectiveness studies as well as economic cost/benefit analyses should be undertaken. Extension programs

may be highly effective in helping to resolve existing production and income-generation targets. Even if economic cost/benefit analyses, with their focus on production yields, do not show impressive gains.

Lack of adequate data has presented a problem for both extension policymakers and providers for years. Systematic, comparable and continuing data collection is needed both through monitoring and evaluation systems. While monitoring and evaluation are often spoken in the same phrase, they require differentiation--even though monitoring information may contribute to evaluative studies. Monitoring is essentially a management supervisory tool. Evaluation, as the word implies, is a judgemental research method, aimed to help with decisionmaking.

CONCLUSION

Three major underlying concerns are revealed in this overview. The trend toward more efficent systems, especially toward private sector extension, indicates the concern with economic viability. Also, donors as well as individual countries are questioning the value of backing single models of extension and consequently there is a growing concern for situation specificity. Finally, it appears that linkage is being placed high on the list of major concerns for extension success. The importance of system interdependence is being reflected in

several ways--through technology system analytical frameworks (Swanson, 1986), in major interdisciplinary studies--e.g., that by the International Service for National Agricultural Research (ISNAR), and in new national arrangements for research/extension linkage.

The new environment of questionning and exploration regarding extension systems and the transfer of knowledge appears to be a healthy development, but answers are not yet clear and will probably to be found in small steps rather than large gestures. Although concerns with economic viability have highlighted the efficiency and effectiveness of private enterprise and put public extension defenders on the defensive, it is obvious that the private sector is only interested in certain low-risk, high-yield situations and therefore not sufficient to develop the agriculture sector in its entirety in developing countries. In addition, the trend of the last two decades to develop "models" of extension appears to be coming to a close. The principles of extension, not systems, are coming into the limelight. Indeed, the concept of situation specificity argues for diversified systems. While incipient, it appears that national arrangements fostering new policies and institutional designs in this regard are finally coming into being. The critical need now is for analyses that show the relative effectiveness of these and other national arrangements for extension.

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