ENERGIZING THE COMMUNICATION COMPONENT IN EXTENSION: A CASE FOR NEW PILOT PROJECTS

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Introduction

I was invited to talk about communication technology applications in agricultural extension around the world at this symposium. It is a challenge to review 30 years of history in 30 minutes. I find it hard to teach a graduate course on this topic every fall since the quarter is only ten weeks long. My first task then, is to set limits, so what I do say will have some depth in addition to breadth.

The topic I will address is a *subset* of communication technology use in agricultural information systems. This will exclude very important telecommunication and telematics applications used for administrative efficiency, telecommuting, remote office work, market information procurement, and consumer research. For example, I will not discuss Thai pineapple farmers' use of fax machines to recruit private consultants from Hawaii. Nor will I deal with India's indigenous development of rural automatic exchanges, in part so farmers can telephone their markets for price information to decide when to move their products for sale, or the Indian Planning Commission's use of the satellite-based National Informatics Center Computer Network (NICNET) to collect and update data from district headquarters on a variety of sectors including agriculture.

Major determinants of communication technology use in agricultural information systems are availability of the infrastructure and the ability to pay. I will restrict myself to communication technology use in what is commonly known as extension, in presently less technologically advanced countries. I will organize my comments as follows: The first section presents my reconceptualization of extension based on three-way flows of information. The next section focuses on how communication technology can energize my restructured conceptualization of extension. I describe the potential of media-based extension, drawing on behavioral science findings that extend the limited notion of media capability found in diffusion research generalizations. I then list the roles of the private sector and the public sector in implementing systematic message design to deliver the potential of media-based extension. In the final section, I summarize my recommendations on lending to support message design for media-based extension.

Extension Reconceptualized

Worldwide investment in agriculture extension has doubled in the last decade. Global annual expenditure of over US$6 billion in 1990 was nontrivial. The Bank's lending to extension aspects of

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projects exceeded US$2 billion over the last 25 years. The 1990-94 investment plans show an increased rate of investment, at some US$150 million a year (Zijp 1992). The 1989 Birkhaeuser, Evenson, and Feder (1991) review of the economic impact of agriculture extension shows significant and positive extension effect. While the evidence of significant effect on output is convincing, the evidence regarding the profitability of investment in extension from a social welfare prospective is limited. Many (for example, Jon Morris 1991, Charles Antholt 1991, and John Hayward 1987) feel that the impact of extension, in general, has been less than anticipated. The 1991 report of the Bank's workshop on agriculture technology in Sub-Saharan Africa (Graegy and Anderson 1991) concluded that research and extension have contributed to the downward spiral in agricultural productivity. Achieving clarity on the next steps is important because every country continues to invest in extension. At least one Bank advisor has written passionately on the critical role of extension in all your "special interest areas," and its importance in reversing the vicious spiral in which lack of diffusion of new technology leads to low growth, political problems, budget cuts, and further reduction in technology diffusion. How should the organization of extension be reconfigured to live up to the need for it?

The traditional concept and practice of agricultural extension is a diffusion of innovations process from government or a commercial firm to farms and farmer training centers. In recent times the process is often called *technology transfer*. This is a fairly mechanical process. Following the Bank's 1990 paper called *Agriculture Extension: The Next Step* (Agriculture and Rural Development Department 1990), I conceptualize agriculture extension as an information service that enhances the abilities of men and women farmers to respond to old problems and meet new opportunities. To me, this conceptualization implies (a) a *long-term* human capital development strategy; and (b) one that targets a *range* of problems, experienced by the full range of farmers, marginal, small, and large. From my own field work in Asia, Africa, and the Caribbean as a communication researcher, and from a review of the literature, it is clear to me that a restructured agriculture extension strategy must explicitly support the following:

- *A Farmer-Research-Farmer System.* The research-extension cycle must begin with the farmer rather than in the laboratory. The process must be renamed, but that is not enough. The operationalization of the process must place the *farmer first* and *last*. Axinn (1988) calls this the participatory approach to agriculture extension. Examples include the small farmer development projects in Nepal and Bangladesh, the Farmers Association of Japan, Sri Lanka's Sarvodaya Shramadan Movement, and the Basic Village Education project in Guatemala. Some hard-nosed economists might be uncomfortable in the company of advocates of grassroots democracy such as Paulo Freire, Robert Chambers, Robert Rhoades, Gordon Conway, and Paul Richards who support this emerging paradigm. Implicit in this alternative *farmer first* view is *technology support* for intensification of *three* flows of communication. First is horizontal communication between farmers to develop a consensus on needs and to share their own indigenous solutions, followed by communication from farmer to researcher to facilitate collaborative diagnosis and resolution of unsolved problems, and only then is it time for a restructured version of the presently dominant researcher to farmer information flows.
- *Different Strategies for Different Contexts.* The content and form of extension information must be sensitive to the range of farmer realities, personal and contextual--gender-specific, ethnic, ecological, social-structural, political, and economic. This refers to fundamental systemic change in the extension approach rather than merely its efficient management. Only a third of all extension resources are directed toward the vast majority of small and marginal farmers (Zijp 1992). I suspect a negligible proportion of extension resources are directed toward women-focused strategies in spite of their varied participation in agriculture. The pattern is not surprising because there are few women extension workers. The typical college graduate extension worker is a male professional who prefers

to spend his time with more educated male farmers who have the resources to act on the input-intensive advice he has been instructed to share. Conversations between male extension workers and women are not culturally acceptable in many societies and, therefore, occur infrequently. Radio and television programs that accurately portray and even emphasize women's roles could help women farmers improve food production and branch out into cash crops.

- *Integrated Human Development.* Multifaceted humans bring about agricultural development and national development. In addition to how-to-do-it tips, the farmer needs holistic, structural, long-term broadly reeducational information that links a variety of sectors and issues beyond the single crop that her/his extension agent may be knowledgeable about. Relevant overlapping issues such as powerlessness, vulnerability, physical weakness, and poverty interact with self-esteem, gender identity, caste, tribe, class, and culture to set mental boundaries on farmer aspirations and achievements. In addition, the farmer might also welcome information on horticulture, fisheries, forestry, contraception, and thatched roofs. Radio and television can be organized to deliver this range of expertise to complement the extension workers' interactions.

The next section focuses on media-based extension, first its promise and then the practice. The effects of investment in extension cannot be separated from other inputs in our evaluations any more than the effects of communication programs and systems. This should force us to think logically at the conceptual stage, in terms of when, where, and how communication hardware and programming can *energize* extension. We must specify plausible causal connections and interconnections for particular impacts. Effects can be direct and in the short run, in terms of specific practices, or indirect in terms of enhancing the overall capabilities of the farmer over time. It would appear that both outcomes would be desirable under your 1990 policy. I discuss implementation problems under four headings: the project context, its administrative structure, media selection, and the organization of programming content.

Media-Based Extension

The Promise

The use of communication technology can energize the collection, analysis, processing, and transmission of data needed by the research-extension system in qualitatively and quantitatively different ways, resulting in greater accuracy and representativeness in the portrayal of an issue, and faster presentation of facts. Audio cassette recorders and minicameras can help extensionists at the grassroots level to focus discussion among different groups of farmers on local innovation, know-how, and unresolved problems for transmission to researchers and other farmers. Radio and television stations can then be used to transmit specially produced broadly reeducational cross-sector programming and differentiated recommendations from other farmers and researchers to marginal, small, and large farmers.

The major promise of mass media has been *faster* extension of *quality* information to *more* farmers, especially in areas underserved by the extension service. *Accurate* extension of research and extension expertise via these "magic multipliers" of exposure can be designed to approximate individual and group visits from extension workers, and farmer trips to research centers and demonstration farms at a very low cost for each farmer. The benefit from low-cost outreach of the

mass media can provide the impetus for substantial sectoral reform as it did in the case of formal education in El Salvador (Mayo 1976). High-quality persuasive presentation of tips on inputs, techniques and how to economize in production and marketing has the potential to enhance farmer efficiency in technical, allocative, and innovative ways without any increases in the extension work force.

Use of media with wide-area coverage will level differences in opportunities for exposure to extension between large and small farmers, male and female farmers, and farmers who are closer to headquarters than others. I document one way this can be done in a study I coauthored in the 1970s on agriculture extension in India (Prakash and Mody 1976).

Creative enhancement of the extension system through provision of knowledge to all farmers through the mass media should make the job of the field extension worker easier. Media programs, which feature the successes of fieldworkers, can boost morale and present role models for emulation. The radio program *The Old Lady and the JTA,* which features conversations with an extension agent, is among the most popular in Nepal. Similar to materials and messages designed to reach farmers, media channels can also carry training programs and research updates for extension workers on a regular basis. This makes it possible to hire paraprofessional field staff with high school diplomas rather than bachelor's degrees.

Specially designed media programs can also be targeted at the urban public, politicians, and policymakers to ensure that they have a continuously updated understanding of the problems of agriculture. These programs could consist of news programs, documentaries, and education through entertainment, for example, the British radio drama series *The Archers.*

Communication technology like audio cassette recorders (and video cameras if available) can be used by extensionists at the village level to document grassroots innovations, assess farmers' information needs, and establish their program preferences. Viewing of these audio and video tapes by agricultural researchers and headquarters extensionists constitutes "feed forward" or bottom-up information flows that will contribute to the development of the agenda and the program plan for media use. These tapes can also be used as inserts in subsequent broadcast programming.

The Practice

Two agencies which have been very active in using media support for extension in agriculture (and other sectors) because the 1960s are the Development Support Communication Branch (DSC) of the Food and Agriculture Organization of the United Nations (FAO) established in 1969 and the U.S. Agency for International Development (USAID).

DSC's very well-documented projects and communication manuals provide excellent guidance for Third World planners. The jewel in the DSC crown would appear to be the video-based community consensus development horizontal communication system it set up for the World Bank's PRODERITH in Mexico (Balit n.d.). DSC has developed innovative radio broadcasting projects in Mauritania and Chad, run video-based training in Peru and Mali, and designed successful multimedia campaigns in Bangladesh, Lesotho, and Indonesia among other countries. The results of the DSC rat eradication media campaign in Bangladesh were exceptional: the proportion of farmers controlling rats rose from 10 to 40 percent in one year against a target of 25 percent. A media campaign costing US$17,500 and rat bait costing US$23,400 resulted in 1983 wheat harvest savings of US$850,000.

USAID's projects include *Masagana 99,* a radio-based multimedia campaign that contributed to major increases in rice yields in the Philippines; the Basic Village Education experiment in

Guatemala, which demonstrated how radio could affect the pace of change; agriculture extension video training in Portugal; integrated rural development radio in Jamaica; the Liberian Rural Communication Network; and the recently completed Communication for Technology Transfer in Agriculture project. (The Clearinghouse for Development Communication at the Institute for International Research in Arlington, Virginia is a repository of documentation on USAID and other projects.)

Unesco has played a major role in promoting the development of low-cost, low-power community radio stations (in Kenya, Ghana, Tonga, and Sri Lanka) that could potentially energize agriculture extension activities (Unesco 1990). An illustration of successful international horizontal communication is the 11-year old Developing Countries Farm Radio Network in Canada. This Canadian International Development Agency-funded network receives and researches down-to-earth advice from farmers and farming experts, which it then mails out in the form of written scripts to over 700 small community radio stations around the world.[1] These are multilateral and bilateral illustrations; there are innumerable examples of national initiatives in agriculture support communication, but we do not have time to summarize them here.

Patterns of broadcast support for agriculture extension cover a wide range. They include on-going researcher-to-farmer broadcasting through large and small radio and TV stations (with no supplementary audience group discussions and printed materials), to broadcasts followed by organized discussion groups called radio farm forums. The agricultural programming may be restricted to spots, but in many cases, there are regular talk shows, news, documentaries, dramas, and musical medleys. Multimedia campaigns of short duration have focused on specific practices in some cases, and in others, they have aimed at general mass mobilization. The initiative for production comes from various sources: in some cases, it is the ministry of agriculture, in others, it is the government broadcasting agency, a private sector broadcaster, or a nongovernmental organization like the Catholic or Bahai churches. Financing of agricultural broadcasts has reflected the pattern of financing of the extension system.

Given the great need for information to facilitate farmer decisionmaking, and the unreasonably high expectations of mass media in the 1960s, it is not surprising that communication researchers and extensionists feel applications of mass media for agricultural development rarely worked as planned (Hornik 1988). The lack of evaluation data on most applications, uneven incomparable data on the few cases that exist, and aggregation across dissimilar projects may be partly to blame. However, most guesstimates agree that the cost for each farmer of implementing radio-based extension-of-extension is far less than the cost of expansion of the human network that would approximate the same farmer coverage. In some cases the media was the wrong tool for the job, but in most cases, the problem was implementation too.

Specific *implementation* issues that need attention are related to the context of the project, its administrative structure, media channels, and agricultural content.

Context

The media work within the organizational context that deploys them. When media are commissioned by the extension system to carry its messages, their use is influenced by the external politics, which affect the extension system, and the internal politics of the system itself. Like commercial advertisers of goods and services who use communication technology to carry the clients' "message" agricultural extensionists and technology transfer specialists conceptualized communication similarly. They adopted the same one-way information-transfer strategy. In fact, this practice was promoted by academics who were hailed as pioneers.

In 1962, Everett M. Rogers wrote the *Diffusion of Innovations* based upon a linear model of communication, defined as the process by which messages are transferred from a source to a receiver. In 1964, Wilbur Schramm wrote *Mass Media and National Development* for Unesco. *Mass* media were "major multipliers" that would extend the reach of experts and extension staff to remote areas of a country. Although advertising and present agricultural extension systems are both based on top-down information transmission, the process, the production values, and the impacts of the two are quite different. The reasons are not hard to find, but they are not made explicit anywhere. Advertising agencies receive big budgets to do audience research and hire the most creative production talent to persuade clearly defined audience segments with purchasing power to generally make a relatively small change in their consumption habits (for example, switch from one brand of toothpaste to another).

For the most part, agriculture extension's use of media is characterized by low budgets, little or no audience research prior to and during program development, production by jaded government-issue artists whose creativity has been killed by the precedent-oriented bureaucracy, undifferentiated audiences, and the impossible goal of persuading low-income farmers to make major changes in their historically rooted family agricultural practices in the short run. When such media programs produced by agriculture departments (and their sister agencies in health, nutrition, and family planning) did not work, the privatization-inspired recommendation was to parallel the media production practices of commercial advertisers more closely, thus leading to what we now call "social" marketing campaigns. The fundamental one-way information transmission *context* of media use in agriculture extension has remained the same and will remain unquestioned as long as agriculture extension continues to define itself narrowly in terms of adoption of innovations prescribed on high.

Administration

The administrative structures of the classical agricultural extension system, its crop-specific variants, and their more efficient incarnations are modified versions of colonial bureaucracies in the developing countries. The bureaucracies of Eastern Europe and the former Soviet Union await modification. Note the irony: innovation-resistant bureaucracies are expected to promote adaption of innovations among farmers. The historical structural rigidities of large top-down agriculture extension systems cannot accommodate the flexibility required to administer local farming system-based recommendations, or participation by farmers in selecting extension-communication content. Thus, when farmer-first orientations are mandated, they are distorted and adapted out of recognition by the innovation-resistant structure.

A prerequisite for farmer-first communication design is farmer-first extension design. The functional organization of a farmer-first communication subsystem in agriculture extension requires the following three areas of expertise and training:

Formative research for message design--this consists of the development of audience profiles of farmers, assessment of their information needs, audience segmentation, and pretesting of draft messages and materials in their formative stages. Existing extension staff could be trained in these tasks (Mody 1976).

Subject matter specialists in the extension agency--they will analyze the audience data to develop alternative problem-solving recommendations tailored to each farmer segment. They will then prepare program specifications for media planners and producers.

Media planners and producers in private and nongovernmental organizations--they are the creative artists. They select media combinations and design messages in response to the measurable objectives for each audience segment set by the agriculture extension agency.

Extension communication is envisaged as a team activity encompassing public and private sector roles. Large bureaucracies run by historical precedent are generally incapable of producing the creative communication design required to attract and hold audience attention. Table 1 charts the roles of the private and public sectors as extension-communication team partners working in participatory farmer-first production modes.

Media Channels

In the first flush of excitement in the 1960s that saw mass media as "magic multipliers" of messages (Lerner 1958), little attention was paid to the content or the innovations that would be multiplied. Political scientists, sociologists, and psychologists who studied mass communication automatically assumed the content of newly introduced media channels in the developing countries would be supportive of national development, and that exposure to these magical channels would automatically lead to what was then called "modernization." The general finding after 10 years of media support for development projects in the mid-1970s was no different from the developing countries' experience with other development projects: very little real development occurred by just about any standard, and what little occurred accrued disproportionately to the better-off segments of society (Rogers 1976). The preoccupation with the technological fix had displaced attention from essential issues of which farmers had access to the media and who controlled its content.

The same mistake continues to be made frequently today: the more expensive technological component gets all the attention, while the programming and beneficiaries for whom it is designed are neglected. I remember writing an article 15 years ago called *Media for Development - But What Messages*? after working for 5 years on the first application of direct broadcast satellites for agricultural extension in the developing countries. In spite of documented lessons from previous development-support communication projects around the world, the rigid division of labor between government departments and bureaucratic inflexibility in the older ministries doomed the Satellite Instructional Television Experiment in India to repeating historical errors. Activity on project hardware started 5 years before the launch of the project; television program content specifications and program production activity started only a year before. Eighty-two percent of project costs was spent on the hardware and only 9 percent was spent on the software. Advanced systematic hardware planning resulted in a project that demonstrated great *technical* efficiency, and the need for greater attention to programming and program utilization by fieldworkers (Mody 1978).

Diffusion of innovations generalizations about mass media that have become part of extension folklore perpetuate this channel-centric perspective (Rogers 1983). The World Bank (1990) *Next Step* document is an example. Message design research in the behavioral sciences tradition (summarized in the following section on media content) has made many of the limitations of media perceived by diffusion researchers questionable. Not one of the diffusion generalizations about amss media addresses the power of media programming experienced by the concerned parent, the Sesame Street fan, and adult education planners.

Diffusion generalizations show past practice aggregated across very different agricultural systems with varying uses of media. They are not specifications of conditions for optimum media use nor should they be read to mean that media use will lead to mere awareness, no in-depth knowledge, and no adoption.

To lenders who ask whether television is better than radio for agricultural extension, the behavioral science research says clearly: audiences learn from all media channels. Given availability of media channels that reach farmers, the choice of media channel should depend on the nature of the informational or instructional task (audio, visual or text, color-relevant or not, one-way or two-way,

Table 1. Public and Private Roles of Team Members in Farmer-First Extension-Communication Systems

Activity	*Primary Responsibility*	*Collaborative Responsibility*
I. *Farmer-related*		
1. Annual study of lifestyle and media habits of farmers for audience segmentation and selection of production formats	Field extension workers trained in formative research for media program development or agrosocial research firm outside government	Writers and producers in media production agency outside government
2. Annual study of information needs of farmers in each audience segment (using video camera and audio cassette recorders when available).		Subject specialists
3. Preparation of annual media and message design specifications handbook that lists audience segment measurable goals, and content per program per audience segment	Field extension worker-formative researcher and relevant agriculture subject specialists	Media production agency outside government
4. Selection of media mix	Media agency outside government	Field extension worker-formative researcher
5. Finalization of creative strategy for series of media materials production	Media agency outside government	Field extension worker-formative researcher
6. Development of pilot approaches and draft message for audience pretesting	Media agency outside government	Field extension workers-formative researchers, subject specialists
7. Audience pretesting for attention, comprehension and action-eliciting potential	Field extension worker-formative researcher	Media agency outside government
8. Modification in media mix and message design approaches for final production	Media agency outside government	Extension workers

Activity	*Primary Responsibility*	*Collaborative Responsibility*
9. On-going process evaluation of audience exposure during dissemination	Field extension workers	
10. Biannual summative evaluation of media message impacts	Independent outside agency	Extension workers
II. *Politicians and policymakers*		
1. Annual study of agriculture-related perceptions and media habits	Public opinion-communication research firm	Extension workers
2. Preparation of annual media and message design specifications handbook for policymakers that lists the audience segment, goals, and content	Extension directors	Media agency outside government
3. Selection of media mix, creative strategy for media series, and development of draft messages for audience pretests	Media agency outside government	Extension directors
4. Audience pretests	Communication researchers in media production agency	Extension directors
5. Modification of media mix and message design approach for final production	Producers in media agency	Extension directors
6. On-going process evaluation and annual summative evaluation	Independent communication research firm	Extension directors
III. *General public*		
The process will be similar to the steps followed in communication attempts with policymakers.		

group or individual reception, and so on), the information-processing ability of the specific audience segment, and the financial and organizational ability of the extension system.

Media channels are only one aspect of society, and are proposed here as one energizing component of a restructured agriculture extension system. Media programs have been effective as catalysts, pivots, and accelerators of larger social or political change effort involving many forces, as in the fall of Marcos in the Philippines and "Baby Doc" Duvalier in Haiti.

Media Content

The benefits of media use have been suboptimal because *the program* content was designed (a) without farmer involvement; and (b) without creativity. The greatest advantage can be derived from the use of communication technology in support of agriculture extension when (a) its content and format are based on audience needs and media preferences; (b) its content is transmitted through a combination of media; and (c) its content is planned in collaboration and coordination with field extension activities and other inputs.

Each of these three conditions is related to content, the software not the channels or media hardware. The audience must participate with extensionists in selecting content they need for goal-oriented communication design. Because every medium has its strengths and limitations, the extensionist who is committed to supplying farm audiences with content that meets their needs will rely on a combination of channels, interpersonal, group, and mass media. Media content must be coordinated with the total extension schedule. The keywords are participatory, combinatorial, and collaborative content specification.

Because the largest amount of research on media message effects has been done in the United States, we circumspectly review what most U.S. media effects researchers generally hold to be true in our quest for insights applicable to agriculture extension applications in distinct developing country settings (Robert and Maccoby 1985). As the political and economic situations of societies change, their media uses change too, and their effects on audiences. Thus behavioral science generalizations about media effects from the United States of America, or Japan must be pilot tested before they are used in Kenya, Nigeria, or Pakistan.

Adults and children can and do learn from *all* media. Learning from media messages usually takes place through changing what we know (that is, cognitions). Cognitions, in turn, influence attitudes and behaviors. Audience members of higher socioeconomic status acquire information about media messages at a faster rate than audience members of lower socioeconomic status. Thus the knowledge gap between the two groups increases, unless special measures are taken to prevent this from happening.

Media messages can provide knowledge about people and places that audiences cannot see or visit. Visual media messages can explain abstract principles by illustrating them in concrete terms. Some media are better able to do this than others. Media materials can give prestige and status to people, for example, fieldworkers, and occupational activities, such as agriculture. The media can focus attention on issues that audiences should think about--the media set the agenda. How audiences interpret media messages and what actions they take depends on the particular audience group. The effects of extension messages depend on the *audience*, not on the volume of media programs transmitted by bureaucractic fiat.

Media messages can be a powerful factor in the development of audience attitudes and behaviors on topics where they know little and have no strongly held attitudes or where behavior patterns exist. However, changing existing attitudes is more difficult. Modeling theory, adapted from Bandura's social learning theory, is useful for the extension agency that wants to change traditional patterns. To change a particular kind of behavior (for example, landlords hiring organized gangs to

beat landless labor into submission), a media organization following Bandura's theory would frequently "model" (portray) preferred *alternatives* (for example, dialogue) for coping with conflictual situations.

The intended audience segment (that is, large landlords) must perceive these presentations as locally viable, profitable ways to deal with the situations that previously caused them to resort to violence. If the large landlord sees the preferred behavior "modeled" in media messages on many occasions, the assumption is that she or he will imitate the theoretically preferable behavior in a *relevant* personal situation. *If* the modeled behavior proves useful in coping with the situation, the large landlord will feel rewarded for trying this new alternative and will repeat it.

Further exposure to media portrayals of the same alternative are needed to *remind* landlords to use the same behavior again. With repeated use, the new behavior becomes the viewer's habitual way of handling that type of situation, unless it ceases to be effective and rewarding. The theory does not promise extensionists that farmers will immediately and uniformly imitate all the prosocial behaviors they present on television and in films. Whether imitation may come later, with the new behavior slowly becoming a part of the farmer's repertoire, will depend on the appropriateness of the alternatives that the production team suggests, the frequency with which they are presented, and the number of times the farmer tries them and finds them useful.

Acting alone, like the constant drip from a faucet that stains a washbasin over time, consistent media portrayals on selected themes can affect ideology, values, and world view of farm audiences *in the long run*. I would commend television and radio drama serials that continue from year to year, portraying farmers accurately, dramatically, and positively to catch the imagination of the urban public and national policymakers, in addition to special series for farmers. The constant orchestrated use of words, images, and themes in print and electronic media do shape the way audiences come to view their world. George Gerbner and his colleagues on the Cultural Indicators project in the Annenberg School of Communication at the University of Pennsylvania assert that the more an audience views television, the more its view of social reality will reflect televised portrayals. Definitions of reality and changing social norms are transmitted by mass media programs. There is consistent evidence that children and adolescents who view televised portrayals of violence demonstrate more delinquency, fighting, and parent-child conflict. Thus, constant exposure to a particular kind of media content can create an environment supportive of the values it epitomizes.

Audiences are not passive internalizers of media messages. Whatever the media presents is modified by the prevailing cultures of class, race, and gender. Partial acceptance, reinterpretation, and sometimes outright rejection of the *planned meanings* (and unplanned meanings) of messages need to be apprehended at the message pretesting stage. Effects of media messages need to be seen in a more complex manner than simple reproduction.

This section has summarized implementation issues that need to be addressed for media to live up to their promise.

Recommendations

I cannot recommend media use as a quick-fix modular addition to the prevailing top-down agriculture extension system. Media-based communication attempts are effective to the extent that their process of message design approximates dialogue in interpersonal communication (Mody 1991). The bureaucrat-to-farmer top-down structure of the existing agriculture extension edifice parallels the

old development paradigm and its parallel communication paradigm that was discarded as ineffective in the 1970s.

I recommend a **farmer-first extension and communication system** to you, to be fleshed out differently in each setting, after local pilot projects. What will be common across countries is clear accountability to farmer clients, monitored by a continuous audience research and evaluation process that may be undertaken in-house or contracted out. Crucial elements of this farmer-research-farmer extension and communication system are prior farmer to farmer horizontal flows of information, followed by farmer to researcher flows. Information may be recorded by fieldworkers on video, on audio or strictly on paper, based on budgets and farmer preferences. The bottom-up process is important, not the hardware.

Once this data is in, I recommend that an extension-communication team develop a long-term program plan that uses multiple media to focus on steps that different audience segments can take by themselves with present levels of input infrastructure and extension support. The available range of media channels to carry the specified content will vary from place to place. A review of the 1991 *Statistical Abstracts* confirms that radio is *the* medium of the developing countries. A radio-based dissemination strategy combined with local television or videocassette and print material (when affordable) and extension support (if available) will probably be the most sustainable agriculture extension media plan, and is perfectly adequate. It would be worth giving thought to financing 1 kilowatt television stations and low-power radio stations as multisectoral integrated rural development facilities, where they do not exist. An additional funding implication is more vehicles, some portable low-cost audio and videocassette recorders, laptop computers for rapid data analysis, and local retraining of existing extension staff as formative researchers for program development if the basic capability exists in-house.

Media planning and subsequent message design to meet agreed specifications is a specialized activity that would be best contracted out to a creative group that is also comfortable with the notion of proving their utility to farmers through systematic periodic program pretests and pilots before final production. The conduct of systematic multimethod social research and behavioral science findings can be taught; creativity in media production cannot be. That creativity does not survive in large government bureaucracies is evidenced by the uninspiring quality of present agricultural media programming output. The lack of audience involvement and media producer-audience-researcher interaction results in programming that ranges from know-it-all subject experts and progressive farmers talking down at audiences to one-shot plays with no dramatic tension or cultural compatability with farmers.

My recommendation gives central place to the extension-communication *message design process*. The process is farmer-based, goal-oriented, and accountable. It combines use of multiple media, and represents collaborative team production between nongovernment and government agencies with different skills. I have been personally involved in implementing this approach to communication design in the Kheda Communication Project, an on-going 1 kilowatt rural TV system in India, and in the USAID financed Jamaica Broadcasting Corporation's agriculture radio station in Mandeville (shut down in 1982 for lack of funds and then leased to a commercial broadcaster by the Seaga regime). If any of you perceive an uncanny similarity between this audience-based program development process and that pioneered by *Sesame Street*, let me stress that this is no accident. The Children's TV Workshop parented the operational model of how to design purposeful and simultaneously entertaining media programming in a parsimonious fashion.

Is the Bank ready in 1992 to experiment with pilot projects alternative to the orthodox agriculture extension and communication systems? I suspect it is almost as hard to change direction within the World Bank bureaucracy as it is within a large developing country government. Ten years ago, one of you wrote: "For a variety of reasons, Bank support for agricultural development has

focused on strengthening and expanding the orthodox agricultural extension system. But in recent years, there has been a growing awareness...that many countries are finding it increasingly difficult to cope with the recurrent costs. There have also been encouraging results from Bank research on the cost effectiveness of media...the result has been a new interest in the possibilities offered by media, particularly broadcast media...in some cases, it is also difficult to deal with such questions as media infrastructure, hardware maintenance, and manpower training on a project by project basis, and therefore a sectoral or even an inter-sectoral approach is needed...the promise offered by such approaches is too great to be ignored, particularly for lowering costs and for quickly reaching large groups of small farmers with information..." (Perrett 1982).

Ten years later, another World Bank advisor writes: "Thinking about extension in and outside the World Bank has reached a crossroads where decisions need to be made on the role of extension in the wider field of agricultural information management...it is silly to invest in separate communication systems for health, education and agriculture, as it would be to build separate roads for doctors, teachers, and farmers..." (Zijp 1992).

Could it be possible that some researchers will be here 10 years later, in 2002, saying pretty much the same thing? Thomas Kuhn (1970) suggested that our critiques notwithstanding, dominant paradigms do not pass away until the power structure and economic conditions that support them change. Criticism of the orthodox top-down extension approach is a critique of neo-classical theory as applied to agriculture. I understand that this is the basic religion here. I remember Larry Shore, a doctoral student at Stanford in the late 1970s standing in the doorway to my office saying "Old paradigms never die, they only change their clothes." You are a very intelligent group of professionals. You have a lot of data and a lot of experience. You can use global telecommunication systems to get any specialized insights you lack. As the largest donor for agricultural extension in developing countries, it is important that you decide to change the rhetoric *and* the reality of agriculture extension.

Sigman and Swanson (1984) reported that the fifty-nine developing country extension directors they studied ranked communication equipment among the top four problems they faced. In fiscal 1979, 1 percent of sector lending was assigned to "communication support" of agriculture projects. I don't know what proportion of the Bank's lending in agriculture is directed toward mass media activities in 1992. I suspect present uses of communication technology are relatively minor.

If you are attracted by the accountability of a farmer-first client-based extension communication system with goals evaluated through constant audience research and monitoring, the behavioral science tradition in communication has a message-design process to recommend to you.

Endnote

1. Developing Countries Farm Radio Network, Toronto, Canada.

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