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9. ABSTRACT <p> Recommendations for communication techniques aimed at modernization and innovation at the farm level. Among generalizations reported are these: The effects of mass media communication channels among peasant farmers are greater when these media are coupled with interpersonal communication channels in media forums. The traditional media have a great potential in achieving development goals because they have a wide audience and high credibility. Change agents interact most frequently with clients who are most like themselves. His ability to link the change agency with his client system lies at the heart of the diffusion process, and if he concentrates on the 10 or 20 percent of villagers who are most influential they can indirectly reach many more clients. Satellite (and non-satellite) television broadcasting offers a great potential, but one that has not yet been effectively demonstrated in less developed nations. </p>

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ACADEMY FOR EDUCATIONAL DEVELOPMENT

**Communications Strategies
for Agricultural Development**

Everett M. Rogers

**Report Number Seven
1973**

This report has been prepared by the Academy for Educational Development under Contract No. AID/csd-2829 for the Office of Education and Human Resources, Bureau for Technical Assistance, Agency for International Development.

Section 220 of the Foreign Assistance Act of 1970 directs the U.S. Agency for International Development to undertake a wide array of activities aimed at assisting the developing countries in their use of communications technologies for education, agriculture, health, and community development. The technologies consist of radio, television, programmed teaching systems, computers, and communications satellites.

To carry out some of the activities mandated under Section 220, AID has contracted with the Academy for Educational Development to direct scientific research on the use of educational technology, to assess educational effectiveness and cost implications of various alternative communications systems, and to develop ways of applying electronic communications systems to agriculture, nutrition, population, and community development.

This report is one of a series prepared by the Academy and its subcontractors for AID under the terms of the contract. The reports in this series include:

1. Research and Development Priorities in Instructional Technologies for the Less Developed Countries
2. Research and Development Priorities in Instructional Technologies for the Less Developed Countries: A Summary
3. Alternative Communications Systems for Education in the Less Developed Countries
4. Broadcast Satellites for Educational Development: Possible Key Policy Decision Points, 1973-1978
5. Broadcast Satellites for Educational Development: The Experiments in Brazil, India, and the United States
6. Strategies for the Use of Mass Communications Media in the Technologically Developing Nations: Basic Education, Family Planning, and Nutrition
7. Communication Strategies for Agricultural Development
8. Communication Strategies for Development: A Summary
9. Technical-Economic Considerations in Public Service Broadcast Communications for Developing Countries

COMMUNICATION STRATEGIES
FOR
AGRICULTURAL DEVELOPMENT

By
Everett M. Rogers
Departments of Population Planning and Journalism
University of Michigan
Ann Arbor, Michigan 48104
U.S.A.

A Report for the Academy for Educational Development
to the U.S. Agency for International Development

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BACKGROUND AND ACKNOWLEDGEMENTS

The present report began in a series of discussions with Dr. Clifford Block of the U. S. Agency for International Development and Mr. Stephen Moseley of the Academy for Educational Development, in November 1971. At that time, the Academy was involved in producing a series of syntheses of communication strategies for AID in such fields as health, family planning, nutrition, and education. I was asked to outline what should be included in a report on communication strategies for agricultural development. After many months and numerous revisions of the outline, the present report has emerged.

A basis for certain of the present contents were provided by my experience at Michigan State University in directing a large research project on the diffusion of agricultural innovations in Brazil, Nigeria, and India from 1964 to 1969. From 1970 to 1973, I studied family planning programs in Asia and Africa for the Ford Foundation, the Population Council, and the U. S. Agency for International Development, and these experiences, summarized in a recent book on Communication Strategies for Family Planning, have undoubtedly benefited the present report. There is great intellectual profit, I find, from comparative analysis of communication strategies in two different types of development programs.

The specific application of communication strategies to development problems was sharpened by my participation in a feasibility study in Guatemala in 1972, conducted by the Academy for Educational Development for AID and the Guatemalan government. Most of the present report was

drafted prior to my work in Guatemala, but the experience there contributed to up-dating my grasp of agricultural development problems and to providing many examples.

Lastly, mention should be made of the assistance provided by Ms. Joanne Knight, an M.A. candidate in Communication at Michigan State University, whose sharp editorial pen and no-nonsense grasp of communication strategies, helped the present endeavor.

We also thank Dr. William Herzog and Charles Woods, former colleagues in the Department of Communication at Michigan State University, for their review of the present work, from which it benefited considerably.

The tone of the present report is frankly critical: We consistently see egregious errors in the use (more often the non-use) of communication strategies by agricultural development programs in developing countries. As a result, there is a considerable potential for increased effectiveness, and efficiency, of these programs. In hopes that such potential will be realized, we provide recommendations for constructive action to remedy the inadequacies listed herein. So we hope our analysis is accepted in the same vein that it is offered: Toward the improvement of communication strategies for agricultural development.

Ann Arbor, Michigan

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COMMUNICATION STRATEGIES FOR AGRICULTURAL
DEVELOPMENT

by

Everett M. Rogers

INTRODUCTION

The purpose of this report is to synthesize communication strategies for agricultural development. The objective of agricultural development is mainly to improve the levels of living of all villagers in less developed countries. So the target audience, whose welfare is to be improved and whose behavior is to be changed, consists of rural people in Latin America, Africa, and Asia. They constitute the most numerous single occupational category in the world, making up a majority of humanity today. The contents of agricultural development programs mostly center on agricultural innovations like fertilizers, new seeds, insecticides, etc., but attention is usually also given to improving nutrition, health, family planning, and community development. Some agricultural development programs deal mainly with providing credit, electrification, improved marketing, agricultural research, or irrigation, and the present report may have something to say to these programs, but its main thrust is for the diffusion and adoption of technological agricultural innovations, which certainly lie at the heart of agricultural development.

The main audience for the present report are the administrators of change agencies in developing countries. In addition to this primary

audience, much of the present content (about communication strategies) may apply to health, family planning, nutrition, and other development agencies, and hence may be of interest to officials in these fields.

Sources of Material

The main sources of material that are synthesized in the present report are:

1. Previous research on the diffusion of agricultural innovations among farmers in less developed countries. About 400 publications in the Diffusion Documents Center at the University of Michigan deal with this topic, and were reviewed in preparing the present report. Foremost in scope among these numerous diffusion studies, and hence most directly useful to the present analysis, is the three-nation Diffusion Project conducted for the U. S. Agency for International Development by the Department of Communication at Michigan State University, under the author's direction from 1964 to 1969 (Rogers and others, 1970). This particular research provides the most comprehensive data-base for the present report, as the investigation was based upon interviews with about 10,000 peasant farmers, village leaders, and agricultural change agents in approximately 300 villages in Brazil, Nigeria, and India.

2. Behavioral science research studies of the process of modernization among relatively traditional people, with special emphasis upon the role of literacy and mass media exposure. We reviewed about 25 to 30 such research reports on these topics in the preparation of the present report.

3. Research and theory about human behavioral change. Much of this work, such as that dealing with persuasion and attitude change, television effects on children, human learning, and the diffusion of new ideas, was completed in the United States, but it has potential application, with proper caution, to the formation of communication strategies for development goals in less developed countries. Such application was aided in the present report by the author's recent experience (1) in investigating the communication strategies currently being used in national family planning programs in less developed countries during 1970-73, and (2) in participating in a feasibility study in Guatemala for a rural development and communication project in 1972.

In the past, there has typically been a wide gap between what is known on the one hand about human behavioral change based on social science research, and the actual strategies of change as practiced by development programs, on the other. The intent of this report is to translate some of the considerable body of behavioral science research findings that exist, into communication strategies that can actually be used by development agencies. And thus we hope to help close the lacunae between this particular type of knowledge and practice.

COMMUNICATION STRATEGIES

Communication is the process by which an idea is transferred from a source to one or more receivers, with the intent to change their behavior.

A communication strategy is a plan or a design for changing human behavior on a large-scale basis through the transfer of new ideas. We feel

there are two essential ingredients for agricultural development to occur: (1) the appropriate agricultural technology, expressed in the form of innovations which are recommended to farmers for their adoption by change agencies, and (2) the communication of these technological messages from agricultural development agencies to farmer audiences. The need for improved technology has received a great deal of attention by international agencies and by national governments. Every less developed nation has an agricultural experiment station charged with conducting scientific research in order to develop agricultural innovations that can improve farm production, and consequently, raise rural levels of living.

But the second ingredient, dissemination of these innovations to farmers, has received little explicit attention. Only in recent years has much scholarly attention been focused upon gaining a better understanding of this process. Little of this work has been incorporated into the daily operation of agricultural development programs. For example, most agricultural extension services expend considerable funds in the publication of agricultural bulletins. In almost every country, extension offices are stocked with bulletins on various agricultural topics. The bulletins are usually authored by Ph.D.'s who are extremely knowledgeable about technical agriculture.

The problem is that these agricultural bulletins have had little measurable effect in communicating new agricultural innovations to farmers! Why? First, the bulletins are written at such a high technical level that an advanced degree in agricultural science is required to understand them.

There are usually no diagrams or photographs. The handling of the topic is not appropriate for a reader who has little previous grasp of the subject. For instance, an extension bulletin on fertilizer in one Latin American country begins with a discussion of Malthusian theory! Second, most farmers in less developed countries are illiterate and cannot read the bulletins. Finally, the bulletins are displayed on racks in local extension offices, but less than 1 per cent of the farmers ever come to these offices, and there is usually no effective channel by which such bulletins reach the village level.

Most communication researches show that extension bulletins are rarely mentioned by any farmer as a source/channel of information about agricultural innovations. Yet most agricultural development agencies continue to invest heavily in the publication of ineffective bulletins.

And this is not the only questionable strategy being used.

Erroneous Communication Strategies

It is very easy to be critical of the communication strategies prevalent in current development programs. In fact, little explicit attention is paid to such strategies in most development programs; it is assumed that "good" innovations will sell themselves. The problem is that they don't.

1. The large-volume error. An apparent strategy (really a non-strategy) of most development programs is that the more communication messages produced and aimed at the target audience, the better. Annual reports of change agencies tell of thousands of bulletins produced and/or

distributed, dozens of radio programs aired, and hundreds of clients attending local meetings. But little or nothing is said about what effect these messages had in securing the adoption of innovations. Usually little consideration is given to exactly which type of message, carried via what particular channel, would be most effective in bringing about what effect (a change in knowledge, attitude, or overt behavior) among what sub-audience. The large-volume error is a broadside approach in that many messages are produced, with the assumption that some of them may have some effect on somebody. It is an extremely inefficient approach. It assumes that communication is a simple, direct cause-effect matter, something like a hypodermic needle injecting the message into the audience. The large-volume error ignores the fact that communication is a process, and that to be relatively effective, much planning and use of specific strategies is required.

2. Over-dependence on mass media. We can also criticize current development programs for their error in thinking that "communication" means mass media. Mass channels like radio and newspapers are highly visible, it is true, but researches consistently show that most diffusion of innovations in less developing nations is via interpersonal channels (Rogers with Shoemaker, 1971). The communication division within some development agency, like a ministry of agriculture, often deals only in the mass media, producing bulletins, radio spots, and posters. Many development officials assume that mass media communication is their only concern. This is a too-limited view of communication. A more adequate approach would also include the interpersonal efforts of change agents to persuade clients to adopt innovations,

and, more importantly, the word-of-mouth exchange between a satisfied adopter and his peers. These interpersonal channels are less visible than the mass media, and they may be less controllable by agency officials. But they are the most important channels by which innovations diffuse. So they cannot be ignored, and in fact, they should be the central concern of communication strategies for development purposes. Interpersonal channels should be coupled with mass media channels in media forums, as we show in a later section.

At the same time that we discern an overdependence on mass media channels in most development programs, we feel that agricultural development programs may also be criticized for their overdependence on agricultural change agents (without the use of mass media channels to supplement their instructional efforts). When agricultural extension work began in the United States (around 1911), farmers were not reached by radio, print, or television messages. Extension agents were trained strictly in technical agriculture, and were incompetent to utilize audio-visual media to increase their teaching effectiveness. With the possible exception of farm demonstrations (which were, and still are, widely utilized), the extension agent made no use of the oral and visual media.

When the agricultural extension approach was transferred to less developed countries, often by U. S. advisors, there was a tendency also to implant the overdependence on interpersonal channels from the change agent to his clients. Even where the media were utilized in agricultural development programs, they were seldom integrated in a multi-media approach to supplement change agents' work-of-mouth activities.

The following problems represent some of the shortcomings of using a single mass media channel for diffusing innovations.

(1) Limited exposure. In less developed nations, the mass media reach much smaller audiences than in more developed countries. About one-third of the village audience in less developed nations is not in the audience for any of the mass media, about one-third is reached only by radio, and roughly one-third is in the audience for both the electronic media (like radio) and the print media like newspapers and magazines.* The limited availability and high cost of the mass media, plus the barrier of widespread illiteracy, act to restrict exposure to the mass media. "The hypothesis about the impact of the mass media can be applied only in areas where media circulate widely, and where, equally important, they command attention and deal with questions of interest to farmers in comprehensible terms" (Meyren, 1962). Mass media audiences, especially the electronic media audience are growing rapidly throughout the world, and the future may hold a much greater promise through satellite TV in countries like India and Brazil, where satellite TV systems are now entering a pilot testing stage.

(2) Message irrelevancy. The presently limited success of the mass media in contributing toward development goals is, at least in part, a case of the process of communication being limited by the content of the message it carries. Content analyses of the mass media in less developed countries

*These estimates are derived from large samples of peasants in Columbia, India, Kenya, and Turkey (Rogers with Svenning, 1969, p. 118). Obviously, these proportions vary with the socio-economic level of the village, its distance from a large city, etc. These estimates (above) are for the direct audience for each medium; in addition there is an indirect audience of considerable size, such as a literate family member who reads a newspaper to his relatives.

show that most message content is (1) consummatory (that is, for entertainment purposes) rather than instrumental, (2) irrelevant to the information needs of rural, non-elite audiences, and (3) devoid of "how-to" information about innovations in agricultural, health and nutrition, family planning, and community development. The background and training of the mass media communicators do not prepare them to effectively produce messages for their mass audience; a wide heterophily* gap between sources and receivers precludes effective communication. Private radio, TV, and newspaper enterprises that depend on advertising support are simply not motivated to appeal to potential listeners and readers whose subsistence position places them on the edge of the market economy.

(3) Low credibility. We define credibility as the degree to which a communication source or channel is perceived as trustworthy and competent by a receiver. In other words, credibility is the degree to which someone receiving a message has trust in the reliability of the source of the message. The mass media are often perceived as relatively low in credibility by the rural audience in less developed nations (Ramos, 1966; Herzog, 1967).

One reason for this relatively low credibility of mass media channels in less developed countries is that there is often a high degree of government control over the mass media, especially the electronic media. To the extent that national governments in less developed countries use the media

*Heterophily is the degree to which a source-receiver pair are different in certain attributes.

as tools of development, and their use is largely limited to promotional purposes: "Much of the content in all of the media, including advertising, is informational, educational, or propagandistic in nature, designed to inform or persuade people about various kinds of modernization" (McNelly, 1966). The pro-modernization theme of the mass media in less developed nations is at least partly a result of governmental control, which leads the media to speak from a single viewpoint, but which contributes to relatively lower credibility in the eyes of the receivers.

Mass media messages are predominately pro-modernization in nature. Then why are these media not of importance in diffusing innovations? There are at least two reasons. First, while mass media messages are pro-modernization in thematic content, they give little attention to technological innovations. The media feature messages about development plans and projects, and effectively preach the gospel of desire for higher levels of living, but there is little content about new ideas in agriculture, health, or family planning, so the media picture the "wants", but do not help to obtain the "gets".

Secondly, we must distinguish between two different types of attitudinal effects of the mass media: (1) a general attitude toward change, the so-called "climate for modernization" (McNelly, 1966), and (2) specific attitudes toward innovations. Mass media exposure is able to create a generally favorable mental set toward change, but has seldom been able to form or change specific attitudes toward new ideas, especially strongly-held attitudes like those involved in family planning behavior. Rogers with Svenning (1969)

conclude from the analysis of their Colombia data that the mass media's role may be mainly to achieve a climate for modernization, rather than to provide specific details needed for adoption of innovations.

3. Overdependence on "modern" channels. As a society begins to develop, its communication channels are expanded and thus become able to reach larger audiences. Soon, it is easy to forget that a system of mass communication existed long before the relatively recent introduction of electronic and print channels. These "traditional" channels consisted of traveling balladeers, village theater, puppet shows, and story-tellers. The "news" got around, and fairly quickly, before the day of the transistor radio.

Most development planners ignore these traditional media, and only in very recent years and especially for family planning, have these channels been harnessed for development goals. The channels are already extensive, and are commonly perceived as credible by village audiences. So their potential for fulfilling development purposes is high, as we show later in the present report.

4. Lack of a multi-media approach. Many of the communication strategies currently utilized in development programs involve only a single medium or channel. Typically, an official has a surprising success in reaching a target audience with some particular channel, say radio. He then becomes an enthusiast for using that channel for all other purposes. Inevitably, this single-channel approach fails. Why? Because (1) it assumes that there is a most effective channel for all purposes (there isn't), and

(2) it ignores the fact that communication requires a total system approach, that various channels, acting in concert, can out-perform any given channel. So communication planning should account for the interdependence of various channels in carrying interrelated messages. They need to be orchestrated in an integrated manner by means of a communication campaign. This is the multi-media approach. Only in very recent years has its potential even been recognized.

So we see that agricultural development programs often use no communication strategies, or else inappropriate ones. Improvements only in the technology of communication, without proper communication strategies, will not lead to agricultural development.

MODERNIZATION AND DEVELOPMENT

Modernization is the process by which individuals change from a traditional way of life to a more complex, technologically-advanced, and rapidly-changing style of life (Rogers with Svenning, 1969, p. 14.) We see modernization at the individual level corresponding to development at the societal level. So development is a kind of aggregated modernization.

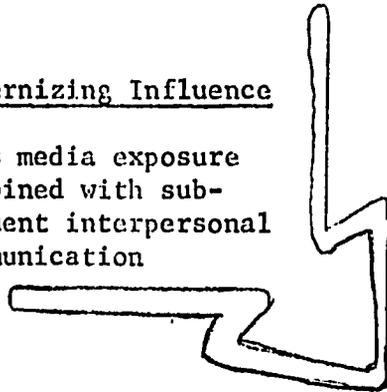
Development is a type of social change in which new ideas are introduced into a social system in order to produce higher per capita incomes and levels of living through more modern production methods and improved social organization (Rogers with Svenning, 1969, p. 8-9). Development consists of more than just economic growth. It means improved nutrition, jobs for the unemployed, and a more equal distribution of incomes (Seers, 1970).

We see the adoption of innovations at the heart of modernization and development. An innovation is an idea, practice, or object perceived as new by an individual (Rogers with Shoemaker, 1971). The adoption of an innovation is one indicant of a changing life-style, whether the new idea is in agriculture, health, family planning, or politics. Adoption of an innovation is evidence of modernization in that it is an obvious behavioral, rather than a cognitive or attitudinal, change. Of course, knowing about new ideas and perceiving them favorably is an important prerequisite to modernization, but the real test of whether an individual has accepted "a more complex, technologically-advanced, and rapidly-changing style of life" is the adoption of innovations. So the best indicators of modernization are planting IR-8 rice variety, getting vaccinated, adopting an IUD, and behaviors demonstrating the adoption of other innovations.

We define the climate for modernization as the individual knowledge, attitudes and beliefs, and behaviors that constitute a favorable mental set toward change (McNelly, 1966). We think of the climate for modernization as laying a fertile field for innovations, as creating a yen for them, as a prerequisite receptivity to new ideas. But we do not see the climate for modernization as synonymous with the adoption of innovations. Adoption is one consequent act, stemming from prior development of a climate for modernization (Figure 1).

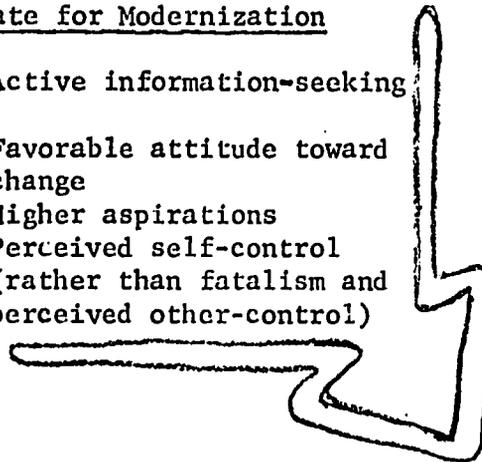
Modernizing Influence

Mass media exposure
combined with sub-
sequent interpersonal
communication



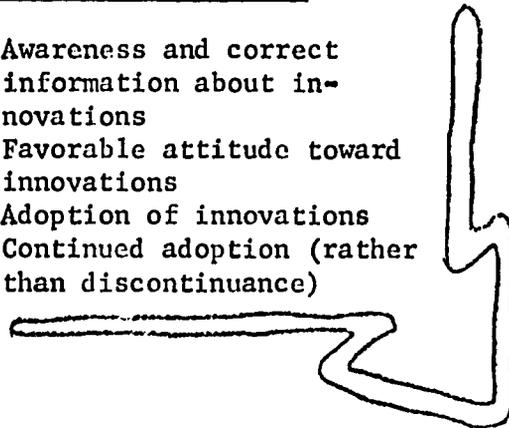
Climate for Modernization

1. Active information-seeking
2. Favorable attitude toward change
3. Higher aspirations
4. Perceived self-control (rather than fatalism and perceived other-control)



Adoption of Innovations

1. Awareness and correct information about innovations
2. Favorable attitude toward innovations
3. Adoption of innovations
4. Continued adoption (rather than discontinuance)



Consequence in More Modern Behavior and Development

1. Higher agricultural productivity
2. Fewer children per completed family
3. Better health and nutrition
4. Wider political participation
5. Higher incomes, and their more equitable distribution

Figure 1.

Role of the Mass Media
in Creating a Climate
for Modernization, Lead-
ing to the Adoption of
Innovations, and Development.

Agricultural Development

Agricultural development is one particular type of development. We define agricultural development as a type of social change in which innovations are introduced into village systems in order to produce higher per capita incomes and levels of living through more modern production methods and improved social organization. The improved methods of agricultural production consist of such innovations as fertilizer, insecticides, new seeds, mechanization, etc. The innovations in social organization may be the founding of marketing co-operatives or of village development councils. We emphasize again that development consists of more than just economic development; agricultural development means food, jobs, and a more equitable distribution of incomes.

The Scope and Integration of Agricultural Development

One of the shortcomings of many agricultural development programs is a too-limited and unintegrated conception of the contents of such programs. The narrow view of agricultural development usually means that it deals with only improving levels of agricultural production, and hence, less directly, with farm incomes and family levels of living. This is the scope as conceived by most agricultural development agencies. The emphasis is upon the agriculture and not upon the development aspects of agricultural development. The reasons for this too-limited conception lie (1) in the organization of such programs (often in a ministry of agriculture), which is usually in competition for funds and public support with other ministries, and

(2) in the specialized training (usually in agronomy or other fields of technical agriculture) of the officials and change agents who are involved. The unfortunate result of this narrow scope to most agricultural development programs is (1) a source-and message-orientation, rather than a receiver-orientation, and (2) a lower degree of audience receptivity to the programs than would otherwise occur. When an agricultural development program does not begin with the farmers' needs and problems, it will not receive his enthusiastic response.

The broader conception of agricultural development includes all of the factors that may influence the improvement of village life by aiding the progress of agriculture and the people engaged in this occupation. Responsibilities for this wider type of agricultural development may rest not only with a ministry of agriculture, but also with ministries of public health, community development, crafts and industry, education, family planning, etc. Ideally, these various agencies should collaborate to provide an integrated program of help to villagers. Such programs are exceedingly rare in less developed countries today. Where they are found, they are likely to be more successful than the strictly agricultural development programs.*

For instance, consider a peasant family in Guatemala whose three-year old child dies. Why did this child die? Most directly, from pneumonia. Indirectly, from a great variety of causes: The child's health was weakened

*Some examples of such agricultural development programs are at the Comilla Academy for Rural Development, Bangladesh; the Gandhigram Institute, India; and the International Institute for Rural Reconstruction, Cavite, Philippines.

by intestinal parasites, contracted because of poor sanitation in the village; his nutrition was sub-standard because the parents are poor; there was little protein in his diet because his family does not have a vegetable garden; he had more brothers and sisters than the parents desired and could afford because they did not use family planning; the housing was inadequate and his clothes did not provide sufficient protection, because his parents could not afford them because of their low income, due to their not using improved agricultural practices on their farm; the parents received no formal education which might have helped them to identify the early symptoms of the child's disease.

So why did the child die?

Our illustration (Figure 2) shows that the problems and needs of village families are interrelated. Such individuals do not divide their daily lives into the specialized fields in which government ministries are organized. So the villagers' needs are unspecialized and undifferentiated; but government programs to meet these needs are highly specialized, and often in competition. This mismatch obstructs peasant receptivity to such programs, as it requires him to make a series of decisions about seemingly-unrelated innovations and services.

In most less developed nations, there is not only a severe scarcity of change agents, but those that do exist operate in a rather uncoordinated manner. Typically, most countries have an agricultural extension service, an agricultural credit agency, an agrarian reform agency, a rural colonization service, a cooperative development service, a community development

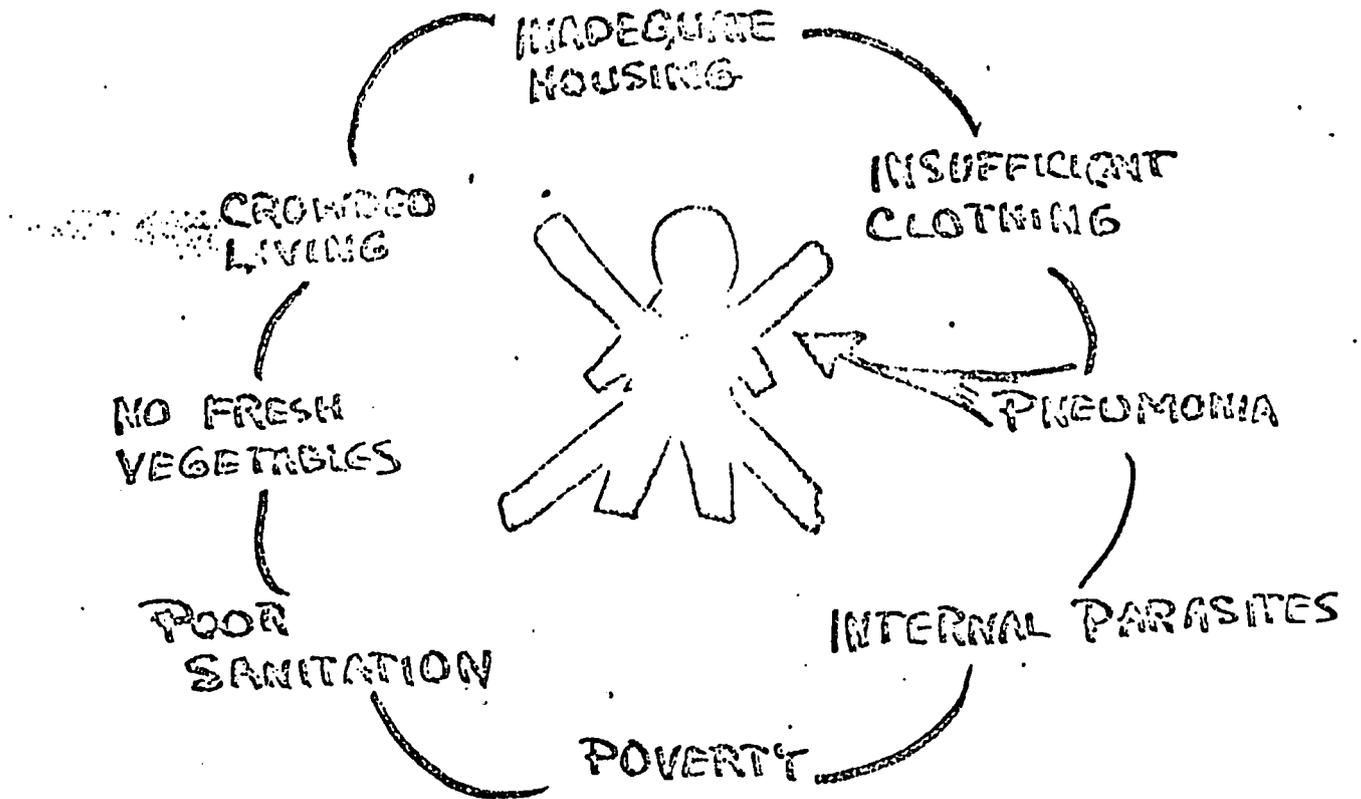


Figure 2.

CAUSE OF DEATH: The specialized function of various change agencies were not able to meet the unspecialized needs of the child and his family.

agency, and many other government bureaus that employ change agents to work with villagers. In addition, marketing associations (for example, a coffee marketing organization in a Latin American country) may also employ change agents to work with local producers of their crop. Commercial companies that sell agricultural products like fertilizer or insecticides or seeds may employ salesmen that offer technical assistance to farmers. There are a host of other government agencies in health, family planning, social welfare, and education that provide local change agents, and many more private agencies doing similar tasks.

The result is a confusing (to the villager) welter of change agencies, each providing a specialized service. Duplication frequently occurs. For instance, in Guatemala prior to 1970, many of the 69 Agricultural Extension Service change agents were assigned to work in the same area as the agricultural technicians of the Indian Economy Development Service. These areas were also the work sites of change agents from the Agriculture Development Bureau (Fletcher and others, 1970, p. 132). This problem of agricultural change agent overlap in Guatemala has since been partially rectified, but not completely. The Agricultural Extension Service and the Indian Economy Development Service have been combined. The agricultural credit agency now channels some of its loan funds through the Extension Service to their clients.

But this trend toward integration of agricultural development programs has not yet begun in many other countries of Latin America, Africa, and Asia.

We summarize the present discussion with two statements:

1. Most agricultural development programs have a too-limited conception of the contents of such programs, dealing only with improving levels of agricultural production.
2. Most agricultural development programs in a particular country operate in an unintegrated and competitive way, forgetting that their clients' needs and problems are integrated.

Conflicting Functions of an Agricultural Development Agency

The agricultural extension service in the U. S. only deals with educational informational functions, while the regulatory punitive functions of agricultural development are conducted by the Soil Conservation Service, the Agricultural Stabilization and Conservation Service, and other agencies. These functions are separated in Taiwan also, where the (private) Farmers' Association carries out the educational function, and the (government) "extension service" carries out the regulatory functions of food production (Lionberger and Chang, 1970, pp. 109-181). Such seeming duplication of the organizations for educational and for regulatory purposes helps to separate the two sets of local officials, and avoid the role conflict that would occur if both functions were provided by a single agency. Frequently, in European countries, however, and in their former colonies, there is a single agricultural development agency. This leads to organizational efficiency, but it is often a dysfunctional combination. In one less developed country, the local agricultural development agent is also responsible for tax collection from farmers!

A separation of the educational informational function of agricultural development from the regulatory punitive function is recommended if agricultural development goals are to be reached in an effective manner.

In some countries like India, the regulatory punitive background of agricultural development agencies leads extension workers to substitute exhortation of their clients for action. A good extension agent has such moral characteristics as dedication, humility, honesty, and respect for authority (Neale, 1972). These same moral characteristics are also applied to clients, and the change agents feel it is their job to instill these characteristics among their clients.

The general point is that the educational informational functions of agricultural development do not mix with the regulatory punitive functions. These two conflicting sets of functions need to be housed in different agencies.

Improving Levels Versus the Distribution of Good: Conflicting Development Goals

In this section we look at two conflicting goals for agricultural development programs. On one hand development programs want to improve the levels of development: To increase the number of acres planted to a new seed crop, to raise total agricultural production, and to improve farm incomes. This goal usually calls for concentrating development efforts on the larger farmers.

On the other hand, such programs also want to help those clients who may need help the most: The poorest and least innovative farmers. This

goal calls for redistributing farm incomes, by bringing up the levels of the smallest farmers. Often, an agricultural development agency has limited resources. So these two goals are in conflict.

Raising the levels of income by working with large farmers brings about a change in per capita income, and hence is apparently a type of development. Real development, however, also consists of attaining a more equal distribution of incomes and levels of living.

Whenever resources are allocated in a program of planned change, the agency chooses alternatives that will best fulfill its objectives. The agricultural development of small farmers requires the most resources and time (per farmer), and offers the least immediate overt results. Most agricultural development programs place emphasis on immediate concerns, such as rural industrialization and diffusion of innovations to large farmers. Such activities show the most rapid overall gains with least expenditure.

Most national and international agricultural development agencies tend to help the larger farmers and pursue a levels-raising goal, rather than helping the smaller farmers through redistribution goals. Dorner's (1972) analysis shows that the UN Development Programme devotes the following percentage of agricultural aid to small farmers and to agrarian reform:

Latin America-----	11%
Asia and Far East-----	7%
Africa-----	8%
Middle East-----	5%

Figures for U.S.A.I.D., World Bank, and the Inter-American Bank are similar, Dorner reports. In Latin America, about 50 percent of all agricultural assistance benefits primarily commercial farmers. The remaining 35 percent goes for general improvements that benefit both larger and smaller farmers.

Dorner (1972) concludes: "The notion that the poor can be helped by aiding the rich must be abandoned." After reviewing available evidence, Seers (1970) concludes that inequality has not been reduced in most countries, and it may have increased in many nations. Thus by any definition of real development, little progress is being made. One reason lies in development policies which raise the levels of income while often worsening the equality of its distribution. Seers (1970) points out that "Practically every decision taken by government officials has implications for the degree of equality," such as to lend to big farmers or small, to put the best equipment in rural or urban schools, etc.

Widening gaps in income and levels of living often result when development programs introduce changes in the status quo of a particular target system (Figure 3). In agriculture, there is obviously a socio-economic gap between subsistence peasants and commercial farmers. In most less developed nations, power lies in the hands of the larger land owners. Much public lip service is given to development goals, but in actuality there is reluctance to initiate major reallocations in the present system (such as through agrarian reform or tax reform), which could affect the positions of the more powerful land owners. Further, the already-advanced large land

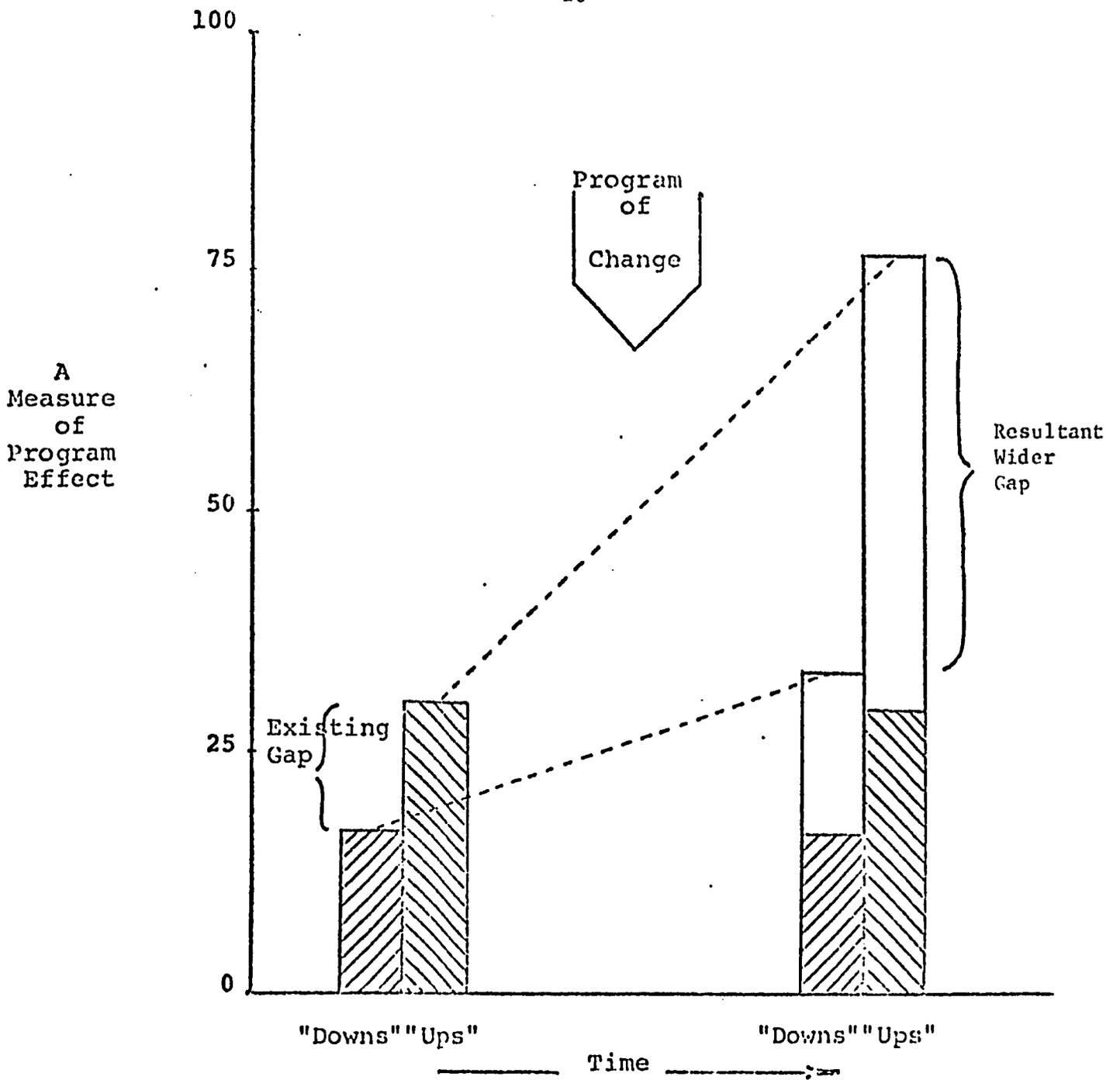


Figure 3. Most Programs of Change tend to Widen the Gap between the "Downs" (Peasant Farmers) and the "Ups" (Commercial Farmers) within the Audience.

owners are in an advantageous economic and social position to adopt agricultural innovations relatively earlier than subsistence farmers. The commercial farmers have a greater degree of contact with agricultural change agents (as we show later in this report). They have more ready resources to invest in agricultural innovations, and they have a more favorable attitude toward new ideas.

Tichenor and others (1970) reviewed several different researches to find general support for the conclusion that: "As the infusion of mass media information into a social system increases, segments of the population with higher socio-economic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease."

This widening "knowledge gap" caused by the mass media is paralleled in most agricultural development programs: Benefits of technological innovations, such as productivity and higher incomes, accrue first to the most responsive sectors of a social system, represented by the socio-economic elites. The rich get richer and the poor get hungrier (Figure 3). Agricultural programs must bring about greater total development, but they must also raise those levels of living where they are now the lowest: Among subsistence peasants (Rogers and Svenning, 1969).

Rogers (1971) argues that social structure and change are interrelated so that the structure acts to determine the nature of an innovation's consequences. The functioning innovations that power elites allow to enter a system are channeled within the system so that their consequences accrue

disproportionately to certain individuals. A recent example is the so-called Green Revolution in India, Pakistan, and numerous other countries. The Green Revolution refers to the sudden, dramatic increase in grain yields brought about by the adoption of improved crop varieties, chemical fertilizers, pesticides, and mechanization.

When the new "miracle" wheat seeds from Mexico were introduced in India, Pakistan, and other nations, the limited supplies were first channeled to large, progressive farmers. Hence, the spectacular consequences of the Green Revolution were mostly reaped by already-rich agricultural elites. "The explosive widening of regional income disparities is one of the most intractable consequences of the Green Revolution. It is the poorer class in the backward regions who suffer the greatest inequity in economic development" (Lele and Mellor, 1972). The social structure determined the innovation's consequences in yet another way. The land owners wanted the full benefits from increased yields, so they squeezed tenants to become share-croppers and pressured them to become landless workers. "Farm mechanization is as irreversible as the Green Revolution which fathered it" (Ladejinsky, 1970); the net result in India is an estimated 35 to 40 million landless laborers who will migrate in search of already-scarce nonfarm employment. The Green Revolution's unequal consequences have created widespread frustration among peasants in India, leading to violence in some areas. "According to the [Indian] Ministry of Foreign Affairs, in the first nine months of [1969], 346 incidents of forcible occupation of land (totalling 100,000 to 300,000 acres) with many murdered and injured have taken place in West Bengal alone" (Ladejinsky, 1970). The

government of India seemed deeply disturbed by the land seizure movement and was motivated to deal directly with one of its main causes, the unequal consequences of the Green Revolution. In fact, a Small Farmers Development Agency was created in 1970 to aid the peasant with credit and technical advice. So a new development agency was founded, to deal only with small farmers. One might expect it to reach especially the richer of these poor farmers.

It is not the new technology per se that is the main source of rising discontent. The improved seeds and fertilizer could provide higher yields on small farms as well as on large acreages. What the high-yielding varieties have done is bring to the forefront the inherent inequalities in the rural institutional structure. "Income inequity and unemployment have been dramatically highlighted by the new high-yield varieties of grain" (Lele and Mellor, 1972). The Green Revolution's "unfair" consequences stem from the inequality of credit availability, from the homophilous tendencies of change agents to contact clients much like themselves, and from the concentration of land and power in relatively few hands.

These social structural variables directly determine who benefits from the "miracle" seeds. So a system's social structure influences the nature and distribution of an innovation's consequences.

Rogers (1972, pp. 78-82) draws the following conclusions about the Green Revolution in Asia:

1. The rate of adoption of the high-yielding varieties was extremely rapid in the early years of diffusion. For instance, the acreage planted

in "miracle" wheats and rices rose from 200 acres in 1964-65 to 34,000,000 acres in 1968-69, and by 1972 it represented about 22 percent of the wheat and 13 percent of the rice land in the dozen or so less developed countries where the new seeds had been introduced.

2. The pre-conditions for the rapid diffusion of the high-yielding varieties in Asia were novel and not likely to be repeated, nor are the current rates of diffusion likely to continue to anywhere near 100 percent adoption.

3. The undesirable consequences of the Green Revolution may eventually outweigh its intended, desirable effects, and the resulting negative perceptions may slow further diffusion.

The Green Revolution in Asia is an extreme example of an important point (one that is often overlooked by the more gradual diffusion of less spectacular innovations): That when agricultural development agencies introduce technological innovations, they may be bringing about major alterations in the social structure of a society. Further, the social structure largely determines the way in which the agricultural innovations diffuse.

COMMUNICATION AND DEVELOPMENT

Communication is the process by which an idea is transferred from a source to one or more receivers, with an intent to change their behavior.

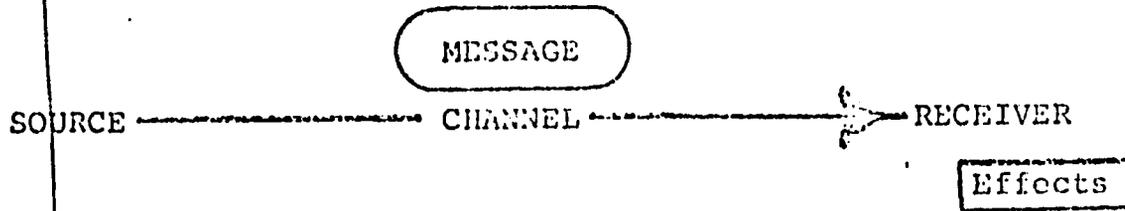
Mass media channels are those means of transmitting messages that involve a mass medium, such as newspapers, magazines, film, radio, television, etc.,

which enable a single source (or several individuals) to reach an audience of many individuals. Interpersonal channels are those that involve a face-to-face message transfer between two or more individuals, who may be family members, neighbors and friends, salespeople, schoolteachers, government change agents, and others.

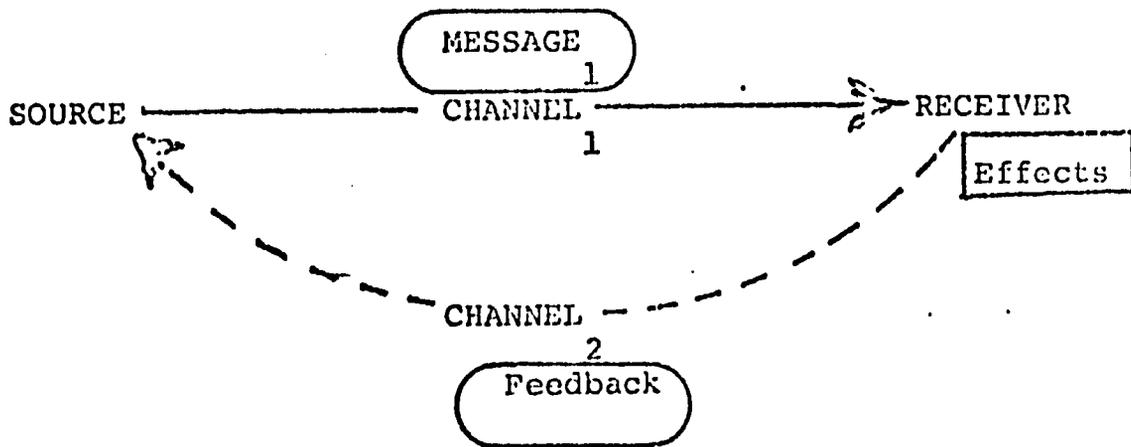
One of the most important differences between interpersonal and mass media communication is that feedback is facilitated in face-to-face interaction. A simplistic view of a communication event consists of a one-way flow of a message from a source to a receiver. But communication is not a one-way process. The receiver also returns messages to the source, dealing with the effects of the original message (Figure 4). In fact, successful communication depends on such two-way interaction.

An example of feedback not being utilized is when the peasant farmers' needs are not communicated "up" to the agricultural scientists to initiate further research. This may be due to the change agencies' disposition toward "downward" communication with few facilities for constructive feedback (Rogers with Svenning, 1969, p. 191).

The most important single element in the communication process is the receiver, the audience, the client. We often forget him. Sources tend to be source-oriented; an example is the textbook author who writes for his colleagues, and misses his student-readers. Or sources may be message-oriented; they know a great deal about their topic, but they do not express (encode) it meaningfully in terms their receivers can understand. Or sources may be channel-oriented; they depend so heavily on a favorite means of



Step #1 - The source sends a message via a channel to the receiver in order to effect his behavior.



Step #2 - The receivers send a feedback message to the source about the effects of the original message.

Figure 4. Human Communication Is a Two-Way Process in which Feedback about the Effect of the Original Message Is Sent by the Receiver to the Source.

communication that the receiver is ignored. An illustration is the change agent who relies so completely on the lecture method of teaching that he never uses a film or other audiovisual materials, even when they would be more effective.

Research evidence on the diffusion of innovations in less developed countries generally indicates that interpersonal channels are of much greater importance than mass media channels, and that change agents are especially important as one type of interpersonal channel. A change agent is an individual who influences the innovation-decisions of his clients in a direction deemed desirable by a change agency. Usually, he tries to motivate the audience or clients to adopt those innovations that are being promoted by his organization, which may in turn be based on clients' needs. Change agent contact seems a necessary condition for diffusion in most less developed nations, as we show in a later section.

Whatever the channels of communication utilized, changes in receiver behavior are the intended result of message transmission; these are communication effects. The three main types of communication effects are:

1. Changes in receiver knowledge.
2. Changes in receiver attitude.
3. Changes in the overt behavior of receivers.

These effects often occur in this sequence. In the special case of agricultural development programs, we want to increase our clients' knowledge, attitudes, and adoption (overt behavior) of innovations.

Interpersonal and mass media channels have different, but potentially complementary, roles in creating various communication effects. The

potential of communication in development can more fully be reached (1) when the mass media are coupled with group discussion in media forums, and (2) when the traditional mass media (such as balladeers, traveling village theater groups, etc.) are utilized along with the more modern electronic and print media. We now consider both of these approaches in detail.

COMBINING MASS MEDIA AND INTERPERSONAL CHANNELS IN MEDIA FORUMS

We earlier pointed out that the mass media alone have had a disappointing role in diffusing technological innovations in less developing nations. But the potential of the media is great if they are used in a complementary combination with interpersonal channels. One type of such channel combination is the media forum.

Media forums were developed originally in Canada for use among farm families, and later spread to such less developed countries as India, Indonesia, Nigeria, Ghana, Malawi, Costa Rica, and Brazil. Media forums are organized, small groups of individuals who meet regularly to receive a mass media program and discuss the contents of this program. The mass medium providing input to the forum may be radio as in the India forums or the radiophonic schools of Latin America*, print fare as is usually the case in study groups in China, or television as in the Indian and Mexican teleclubs.

*In 1972, an estimated 11 countries had radiophonic school programs, usually under the control of the Catholic Church, but often with assistance from national governments.

Types of Media Forums

Undoubtedly, India has the largest, most thoroughly-researched media forum program today, representing "a degree of experience with the radio rural forum unequalled in the world" (Schramm and others, 1967a, p. 107). Regularly-scheduled radio programs beamed at meetings of forum members gathered in homes or public places to hear the broadcast, serve as stimulus for the group discussion that follows. The forums usually provide regular feedback reports of decisions reached and requests for clarification to the broadcaster. Using a similar format, but exchanging the radio for television, UNESCO has sponsored experimental television listening groups in France and Italy, and a teleclub program is presently underway in villages near Delphi.

Media "schools" attempt to provide a basic education, including literacy training for people living in remote rural areas. Radiophonic broadcasters in Colombia, and various other Latin American nations, intersperse literacy lessons with news, agricultural programs, religious training, and music. Each school group of 8 to 20 "students" is led by a trained (but usually unpaid) monitor who guides the students' learning, and encourages them to listen regularly. The monitor may use a blackboard, charts, and workbooks to visually supplement the oral radio channel.

The Chinese Communist Party has employed magazine and newspaper discussion groups as a means of indoctrination and instruction of their party cadres and recruits for 50 years. Approximately 60 percent of the adult Chinese population regularly participates in study groups where print material is read and discussed (Hiniker, 1968). Strict control of

discussion is maintained by the cadre leader who forces each member to take a position on each issue and voice his opinion to the group. Study groups are considered essential elements in the public communication campaigns launched to achieve such varied goals as fly-killing, river-swimming, anti-spitting, family planning, and farm communalization in China.

In all of these various types of media forums, some form of mass media communication is combined with interpersonal communication in small groups.* The group seems to be an important element in moving the individuals toward greater acceptance of the innovation messages being transmitted through the mass media. Media forums in less developed countries can reach larger audiences than the interpersonal activities of change agents (such as agricultural extension agents and community development workers). In turn, forums reach fewer individuals than the unorganized mass media audience, but they make a greater impact on those individuals that they do reach. So the media forum approach offers great potential for multiplying the impact of either (1) the usual mass media alone, or (2) the ordinary change agent approach.

*A combination of mass media and interpersonal channels is also involved in the unorganized group reception of mass media messages, such as group listening to radio programs, which is fairly pervasive in less developed countries where mass media facilities are in short supply. For example, Frey (1966, p. 180) reports that about 25 percent of Turkish villagers listen to radio in public places like coffee houses, and 40 percent listen at another villager's home. However, such unorganized group reception differs from forum receiving in that there is no guided discussions, no systematic follow-up on program content, and no feedback to the program source.

Effects of Media Forums

Although there are important country-to-country and program-to-program differences in the types of media forum systems we have just reviewed, they possess certain common elements. All utilize a mass medium (radio, television, or print) to carry the major load of messages about technical innovations to the discussion forums. All feature small-sized groups whose members are exposed to the mass media channel, and then whose members participate in the discussion of the message. All of the media forum systems seem to be generally effective in creating knowledge, forming and changing attitudes, and in catalyzing behavioral change. But adequate scientific evidence of these media forum effects is rare; exceptions are (1) Neurath's (1960 and 1962) field experiment with India radio forums, (2) Menefee and Menefee's (1967) study of the effect on political knowledge of community weekly newspapers when read and discussed by reading forums in Indian villages, and (3) Roy and others' (1969) analysis of the effects of radio forums on knowledge, attitude, and adoption of innovations in India and Costa Rica. All of these researches emphasize that the effects of mass media communication channels among peasant farmers in less developed countries are greater when these media are coupled with interpersonal communication channels in media forums.

Despite this scientific evidence for the impact of media forums, most national forum systems have been plagued with organizational difficulties. For example, official evaluations by Indian government inspectors have professed disappointment with the forum system. "The trouble

is not with the forum pattern itself, but with the way it is being operated" (Schramm and others, 1967b, pp. 123-124). Forums require continuing attention from professional organizers, forum members drop out, radios break down or their batteries are exhausted. Radio forums do not run themselves (Schramm and others, 1967b, pp. 132-133)* Nevertheless, India radio forums have been steadily increasing in number, and they now enroll over a quarter of a million villagers (Schramm and others, 1967a, p. 53).

Why do individuals learn more when they are members of media forums?

1. Attendance and participation is encouraged by group pressure and social expectations.

2. Attitude change appears to be more readily achieved when individuals are in groups, because attitudes are often anchored in group relationships. Group decisions are more likely to be accepted by the individual if he participates in making the decision, as usually occurs in the media forums.

3. Feedback to the broadcaster from media forums is provided on a regular basis, leading to greater efficiencies in program planning and production, and to a greater degree of receiver-orientation.

TRADITIONAL MASS MEDIA

One of the first signs of modernization in a society is the lengthening of communication channels. Villagers begin to travel to metropolitan

* Nor should radio forums be thought of as inexpensive operations, although this opinion is sometimes expressed by those who do not see the partially hidden costs of "free" radio time and forum organization, which are often absorbed by other budgets. If all expenditures are included, Schramm and others (1967b, pp. 130-131) estimate the total cost per forum per year in India is about \$72 (or \$3.46 per forum member, or 9 cents per listener hour).

centers, and the electronic mass media begin to reach out to larger audiences. But we should not forget that in most less developed countries, there is already a far-flung network of public channels, which existed long before the print or electronic media.

These are the "traditional" mass media, and include such channels as folk theater, traveling storytellers, balladeers, puppet shows, poets, etc. These channels are traditional in that they were long part of the culture, but their messages may be either modern or traditional. Thus their potential as tools for development. A particular advantage of the traditional mass media is that they are long-established, well-accepted. In contrast, the modern mass media are themselves an innovation, a change that must be accepted before their messages can have an impact. Strangely, development planners have generally ignored the potential of the traditional media, restricting their thinking only to the modern mass media, when in fact, the modern and the traditional mass media are often functionally interrelated. For example, Benajamin (1969) found in Northeast Brazil that cantadores (singing poets) act as an intermediary in the two-step flow of communication, by learning of new ideas from the modern mass media, and passing these messages along in poetic form to villagers.

Another possible interrelationship between the traditional and modern media is found in several countries: A traditional program may be broadcast on a modern media channel. For example, a village theater show was regularly carried by the government radio station in Nigeria. Similarly, All-India television broadcasts a traditional puppet show. In both of these illustrations, some modern ideas (like

chemical fertilizer and family planning) are included in the message content of the traditional program, carried by a "modern" communication medium.

In China, folk theater is a vital part of government communication campaigns. The ludruk theater plays in East Java (Indonesia) at least symbolically encourage modernization by depicting a "better" and more modern life, which can be gained through acceptance of new ideas (Peacock, 1968). In India, some state governments include such traditional media as singing story-tellers as part of their development campaigns. Family planning campaigns have probably made the most use of traditional media to diffuse innovations; plays, songs, and traditional instruments have been used to promote contraception in Indonesia, Pakistan, Iran, India, and many other nations.

The traditional media can carry modern messages, but if the media are not transformed in a gradual and constructive way, the whole effort may fail. There is evidence of this important point in the Chinese experience. Prior to 1949 (in Nationalist China), there was an extensive network of traditional media, consisting of village theater, story-telling, and ballad-singing. But when the Communist government came to power on the Mainland, it insisted that the traditional mass media channels drop their traditional and mythical content and switch to political messages. Further, the number of story-tellers, singers, and performers were greatly increased in a short period; within 10 years there were an estimated 280,000 song-and-dance troops. Their professional skill was often low, and the Peking government had to enforce listening

in order to gain adequate audiences. The net result, Liu (1965, p.90) concludes, is that Peking severed the traditional media from the people. Instead of introducing new ideas to the peasants, the political leaders alienated them.

A parallel conclusion is reported in the case of an Indian village when certain modern ideas were introduced by the traditional media. A play about community development was not attended because the villagers criticized the theme; they perceived it as inappropriate because it came from daily life and lacked traditional roots in mythology. The audience reaction was negative and hostile, and many walked away before the end of the performance, Gumperz (1964) reports. In contrast, a traditional Arya Samaj singer used bhajan music for songs about public health and rice cultivation innovations. "His activities have been singularly effective; he has been known to hold an audience of several hundred in bitter cold winter weather" (Gumperz, 1964). This particular singer was employed by government change agents to diffuse innovations because of his professional ability as a singer and his popularity with village audiences. He represented an effective and credible channel in carrying modern messages.

One reason that the traditional mass media have not been more fully utilized by development planners is because they are difficult to control, at least in non-Communist less developed countries. For instance, the village theater of South India often portrays strongly anti-government themes. Indonesia's wajang kulit (shadow theater) and wajang golek (marionette-puppet plays) were anti-Dutch in the Colonial era, and are often anti-government today.

But our main point remains: The traditional media have a great potential in achieving development goals because they have a wide audience and high credibility in the eyes of villagers.

CHANGE AGENT CONTACT

We have shown previously that most diffusion of agricultural innovations in less developed countries is via interpersonal channels, usually from peers such as neighbors, friends, and relatives. However, there must be some introductory channel through which new ideas get into a village from external sources. Mass media could perform this function of providing new information to the system, but diffusion researches show that this rarely occurs. Villagers could travel to other villages, cities, and towns in order to learn about innovations, and past investigations show that this type of cosmopolitanism does occur. But certainly the most important way for innovations to penetrate the boundaries of village systems is for change agents to act as interpersonal cosmopolite channels to the peasant audience.

Such change agent contact with clients is of great importance in the diffusion of agricultural innovations. In fact, in Brazil, Nigeria, and India, Rogers and others (1970) found change agent contact to be the most vital single ingredient in agricultural diffusion. If no extension agent was assigned to work in a peasant village, it was unlikely that much agricultural development occurred. If the local extension agent conducted an active campaign of contacting farmers on their farms and in their fields, the diffusion of agricultural innovations was speeded up,

as compared to another village where the extension agent was less active, and spent more time in his office. The role of the government change agent in diffusing innovations seemed to be more important in Nigeria and in India, than in Brazil where the mass media and commercial farm suppliers provided alternate channels (to government change agents) for agricultural innovations to reach villagers (Rogers and others, 1970). But even in Brazil, change agent contact was the most important communication link between villagers and agricultural development programs.

Role of the Change Agent

A change agent is a professional who influences innovation-decisions in a direction deemed desirable to a change agency. In most cases he seeks to secure the adoption of new ideas, but he may also attempt to slow the diffusion and prevent the adoption of certain practices that he feels are undesirable for his clients.

The change agent functions as a communication link between two or more social systems. For example, a technical assistance advisor provides linkage between a more developed nation, and the less developed country in which he is introducing innovations. An extension agent in a peasant village similarly links the village with the change agency. He communicates the clients' needs to his organization, and innovations to his target audience. Thus, the change agent acts to make a relatively closed system more open. Openness is the degree to which a social system exchanges information with its environment.

A completely isolated, traditional peasant village is a closed system in a state of stable equilibrium, in that almost no change is occurring. All farmers use the same methods, and agriculture is static. There are no innovations in the village, and no new information diffuses. Traditional farming practices are passed from father to son.

Then, as the result of a decision by a government agency, a program of planned change is introduced in the formerly-isolated village. A change agent is assigned to live and work in the village. The former impermeability of the village's boundaries begins to break down; new ideas enter the system and are passed from peasant to peasant. Certain farmers emerge as key communicators in this interpersonal diffusion network; they are opinion leaders. The change agent seeks to contact these opinion leaders most intensively, and innovations flow from them to their followers in a two-step or multi-step flow of communication.

The traditional village has now become an open system, in a state of dynamic equilibrium (one in which change is occurring, but at a rate to which the system can adjust). We see the change agent as playing a key role in the transition of the traditional village from a closed to an open system.

There is often a social chasm between the change agent's system and the clients' system. Typical dissimilarities between such systems include: Subcultural language differences (even though both systems may ostensibly share a common tongue), socio-economic status, technical competence, formal education, and beliefs and attitudes. Change agents, even though they link the two social systems, may be rather heterophilous with their

clients and with their superiors in the change agency. This heterophilily gap on both sides of the change agent causes role conflict, and certain problems in identification and in communication. As a bridge between two differing systems, the change agent is a marginal man with one foot in each of two worlds. His attempts at linking the change agency with his client system lies at the heart of the diffusion process.

Change Agent Effort and Adoption

The degree of success of change programs is usually measured in terms of the extent of adoption of innovations by members of the clients' system. This measure is frequently used because the main objective of most change agents is to secure the adoption of new ideas by their clients.

Figure 5 illustrates the complicated and non-linear relationship between change agent effort, and the diffusion of an innovation over time. We see at Stage I, in the very early phase of an innovation's adoption, that change agent activity has little direct effect on rate of adoption. When the adoption curve starts to climb (from perhaps 5 to 20 percent adoption), increased inputs of change agent activity result in direct gains in the rate of adoption (this at Stage II). But after about 15 to 20 percent adoption, further change agent inputs seem to have no direct effects on the rate of adoption (Stage III).

Change agent effort and success are not necessarily linear, because of the influence-potentials of the particular clients who adopt at Stages I, II, and III. The innovators, who adopt at Stage I, are seldom active in diffusing the innovation via word-of-mouth channels to their peers.

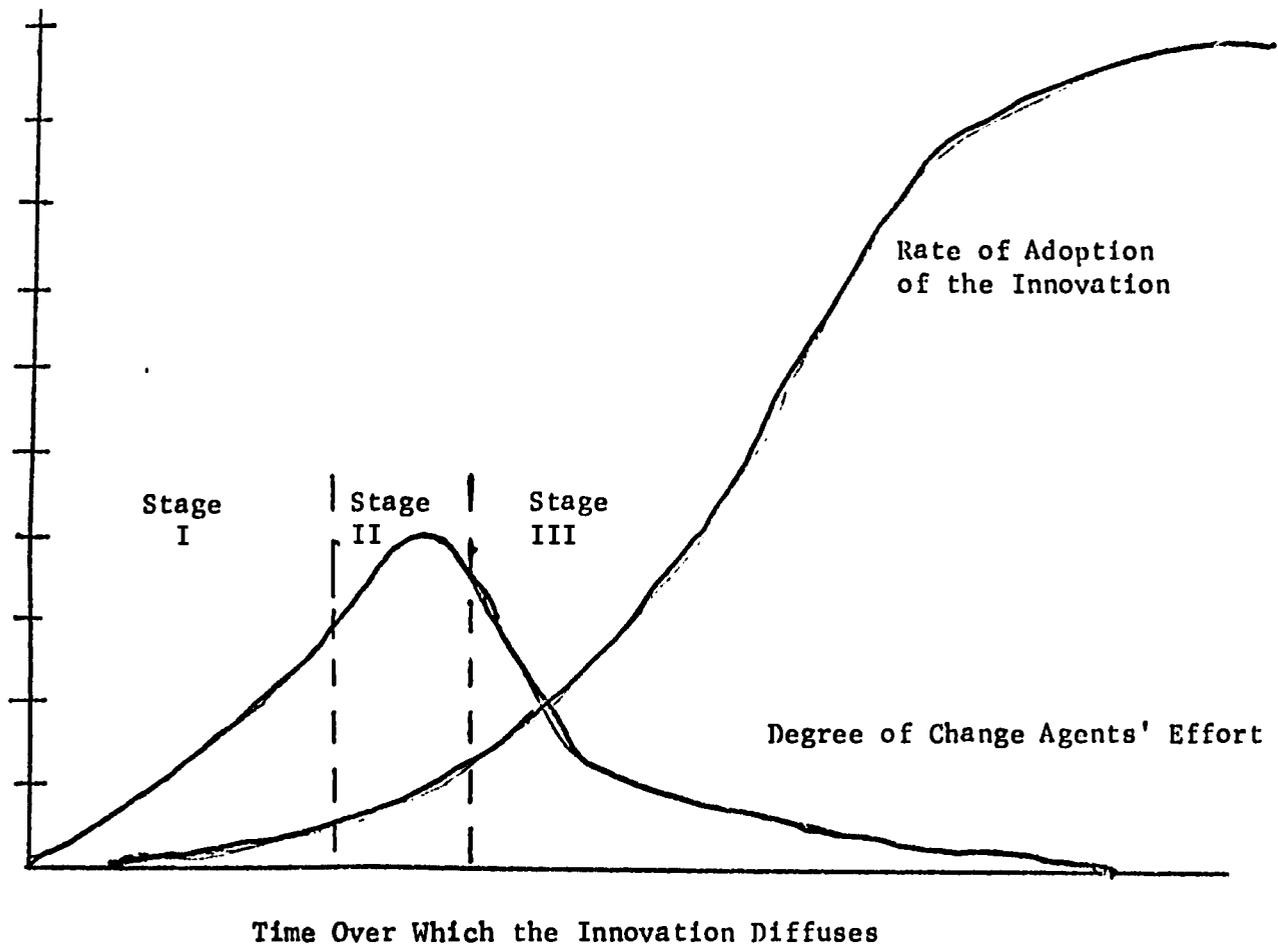


Figure 5. Extent of Change Agents' Efforts and the Rate of Adoption of an Innovation.

At first, change agents' efforts do not result in many adoption decisions (Stage I), but then at Stage II when the opinion leaders adopt, the rate of adoption starts to climb under its own impetus, and the change agents can retire from the campaign. The present figure is an abstraction, based on data from several diffusion researches.

Source: Rogers with Shoemaker (1971), based on several empirical studies.

But the early adopters, who are mainly adopting during Stage II, possess a high degree of opinion leadership in most systems. These individuals influence their peers to adopt the innovation, causing the adoption curve to shoot upward in a self-generating fashion. At this point the change agent can begin to retire from the scene (at least so far as this particular innovation is concerned). In Stage III, the adoption curve continues to climb, independent of change agents' efforts, under further impetus from the opinion leaders.

Change agents tend to concentrate their attention on the more elite and more innovative clients in more traditional villages. The adoption of innovations occurs mainly as a direct response to change agent contact, and change agent contact occurs especially among the village elites. At this stage, opinion leaders for innovations have not yet emerged, so that new ideas do not diffuse spontaneously through the system. Such a traditional village will move slowly out of Stage I (Figure 5).

The relatively more modern villages appear to be in a state much like that in Stage II. The change agent has contact mainly with the opinion leaders, and farmers in the system are adopting the innovation not only due to change agent contact, but also because of the activities of opinion leaders. In these villages with relatively modern norms, change agents are able to use the two-step flow of communications to multiply their own efforts in diffusing innovations.

Opinion leadership is more highly related to change agent contact in modern, than in traditional, villages (Rogers and others, 1970). In other words, in the more modern systems (where innovations are diffusing more

rapidly and effectively) change agents are concentrating their contacts especially on those clients with most opinion leadership.

Peasant clients with greater change agent contact are characterized, Rogers and others (1970) found by:

1. Higher media exposure
2. More cosmopolitaness
3. Higher level of living
4. Larger farm size
5. Greater social participation
6. More formal organization leadership
7. More political knowledge
8. A greater likelihood of functional literacy
9. More formal education.

Change agent contact is also related to:

1. Agricultural innovativeness
2. Knowledge of agricultural innovations
3. Opinion leadership.

In other words, change agents interact more frequently with clients who are most like themselves.

Change Agent Contact as a Scarce Resource

If change agent contact is so important in diffusing agricultural innovations, why not simply provide more of it? Because it is a very costly resource, and most national budgets have not evinced a willingness to provide funds for a very favorable ratio of clients-to-change agents. Further, many years would be required for enough agricultural change agents to be trained to fully meet the need, even if adequate funds were available.

For example, in Guatemala there are 39 extension offices that cover about 25 percent of the most densely settled area of the country including

about 136,000 rural families (Fletcher and others, 1970, p. 130). However, these extension agents actually are only able to work, even in a minimum way, with less than 20 percent (about 27,000) of these families. So each extension worker (there were 69 agents in the 39 offices in 1969) reaches only about 400 families. As there are 7,500 farms per extension agent in the country, only about 5 percent of the farmers are directly reached in any way. The total annual budget of the Agricultural Extension Service in Guatemala is \$0.50 (U.S.) per farmer. If every farmer in the country were to be contacted by extension agents, at least 20 times as many extension workers would be needed, and the yearly cost would be about \$10.00 (U.S.) per farmer. The per capita income of the rural population in Guatemala is only \$75.00 (U.S.) per year. How could 13 percent of such income possibly be justified for an adequate extension service? It can't.

Further, at the present rate of training extension agents (who receive three years of high school level vocational schooling, plus some extension training), 28 years would be required to train sufficient agents for Guatemala's needs (Fletcher and others, 1970, p. 134)! Clearly, extension agent contact with farmers is likely to remain a very scarce resource for many years to come in Guatemala.

The situation is generally similar in most other nations in Latin America, Africa, and Asia.

Background and Training of Professional Change Agents

What are most agricultural change agents like? Generally, they are

professionals, and have a university or technical school degree in agriculture. Their curriculum consists mostly of applied biological science courses with very little or no training in the behavioral science aspects of changing human behavior (such as courses in psychology, social psychology, sociology, or anthropology). They may have one or two courses in economics or agricultural economics, and perhaps, a course in extension education. It is unlikely that they have had training in such communication skills as producing a mass media message (for example, a course in journalism) or in audio-visual communication.

In most developing countries, university graduates in agriculture do not come from a farm background. Farmers' sons are lucky to receive a couple of years of formal schooling (and thus attain literacy), and so those individuals with practical experience in farming almost never go to the university. Some university graduates in agriculture may be the sons of rich landowners, and hence have had some direct contact with farming, but even they have lived most of their lives in the city. In any event, a wide socio-economic gap divides the university graduate in agriculture from his village clients. They are worlds apart in life style, attitudes, and social status.

In the mid-1960's the author was involved in training a group of newly-employed agricultural change agents in Colombia. Each professional was sent to live for two weeks with a peasant family as a means of gaining empathy with his clients. These university graduates complained bitterly about the poor food, the rats that disturbed their sleep at night, and other difficult aspects of their living conditions.

But at the end of the two weeks' period, the change agents realized they could now begin to look at the world through a peasant's eyes. And to them, this was an entirely new viewpoint.

The theoretical nature of the university agricultural curriculum, and the socio-economic heterophily between change agents and clients, contribute toward a lack of receiver-orientation on the part of most professional change agents. Instead, they are source-oriented to their professional colleagues, or else message (agriculture)-oriented.

A common problem for agricultural change agents is that they are often younger than many of their clients. Unfortunately, peasants tend to evaluate the credibility of change agents on the basis of their age, for to the traditional villager, wisdom comes with accumulated experience, rather than from formal training at an agricultural university.

A high turnover rate contributes to the relative youth of change agents. In most countries, government ministries pay lower salaries than do commercial companies. A steady stream of experienced agricultural change agents leave government service each year, to be replaced by newly-trained individuals who are launching their professional careers.

As an illustration, average monthly starting salaries for peritos agronomos ("technical agriculturalists") and ingenieros agronomos ("engineers of agriculture," or university graduates) in Guatemala in 1971 were:

<u>Employer</u>	<u>Peritos Agronomos</u>	<u>Ingenieros Agronomos</u>
1. Ministry of Agriculture	\$225 (U.S.)	\$300 (U.S.)
2. Commercial Agriculture	\$350 (U.S.)	\$500 (U.S.)
3. Industry and Banking	\$450 (U.S.)	\$750 (U.S.)

Under this reward system, why should a talented young man with agricultural training want to pursue a career as a Ministry employee? A great many do not.

The deficiencies that we have just reviewed in the background and training of professional agricultural change agents lead to the following recommendations:

1. That university curricula for change agents in agriculture should supplement technical agriculture content with courses (1) on the theory and practice of social change, and (2) in communication skills.
2. That in-service training courses should be provided for professional change agents by agricultural development programs, in which field employees are taught (1) basic principles on how to change human behavior, (2) communication skills for producing mass media messages (for example, how to write a newspaper story, and (3) exercises for developing empathy with village clients.
3. That special attention should be given to recruiting change agents (1) who come from a village background, or (2) who have had some practical farm experience prior to their employment, such as working as a farm laborer during university vacations.

Change Agent Aides

Another means by which agricultural development programs can reach a broader audience is through employing change agent aides. An aide is a less-than-fully professional change agent who works intensively with

clients to influence their innovation-decisions. Because the aide is usually from a rural origin and is not university-trained, he is more homophilous with the average client than the professional change agent (Figure 6), and this facilitates more effective communication. Health and family planning agencies in less developed countries have made much more extensive use of aides than have agricultural agencies. The main advantages of change agent aides are:

1. The cost per client contact is much less (perhaps one-half or one-fourth) than that for professional change agents.
2. Their numbers are much more rapidly expandable, because lengthy training is not required, as in the case of professional change agents.
3. Their greater communication effectiveness in reaching clients, because the aides have less of a socio-economic heterophily gap than do the professional change agents.

We propose a classification of aides based on their degree of professionalism.

1. Para-professional aides most closely approach the change agent in professionalism. An example is the perito agronomo ("agricultural technician") in Guatemala, Colombia, and several other Latin American countries. The perito agronomo usually has three years of vocational training at the high school level plus a few weeks or months of extension

Degree of Socio-Economic Status,
Technical Competence, or Formal Education

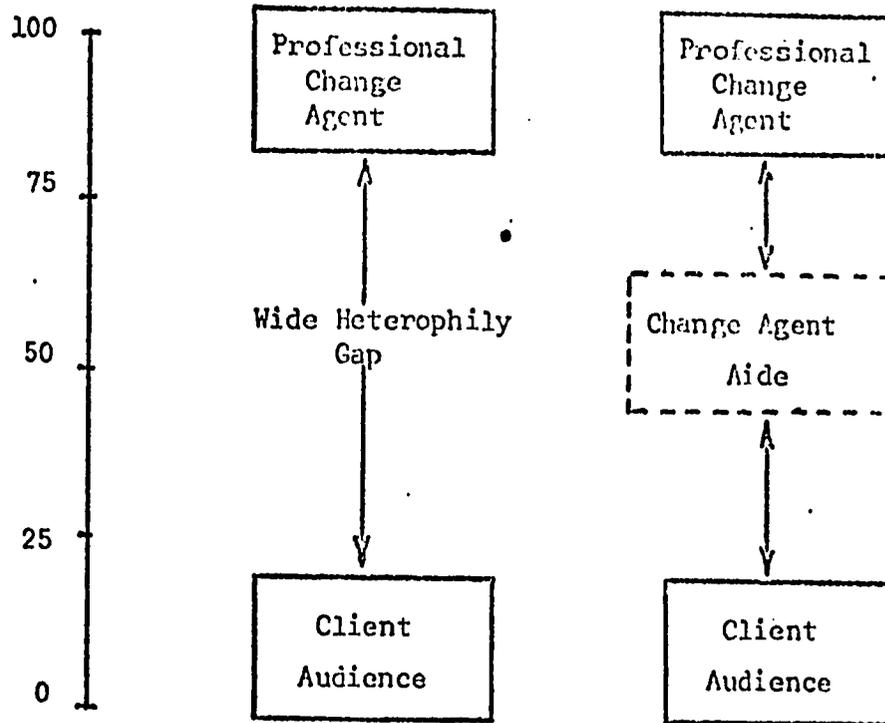


Figure 6. Change Agent Aides Bridge the Heterophily Gap between Professional Change Agents and the Client Audience.

Source: Rogers (1973, p. 124).

training. Because he lacks the ingeniero agronomo ("agricultural engineer") university degree, and the professionalism it symbolizes, the perito agronomo is often barred from advancing to supervisory or administrative posts in the agricultural change agency. Other illustrations of para-professional aides are the "agricultural assistants" found in Nigeria and several other former English colonies in Africa, and the mejoradoras del hogar ("home economics extension aides") in most Latin American countries.

2. Quasi-professional aides have a relatively low degree of professionalism as change agents, often gained mainly through experience rather than formal training. One example is the village level worker (VLW) in India, who may have an elementary education plus six months of extension training; he must come from a village background, and may have some farming experience.* He is relatively homophilous with his clients; they are his near-peers.

3. Non-professional aides have no professionalism and a very low degree of technical competence. An illustration is the "farmer-dealers" of fertilizer, agricultural chemicals, and seed companies who market these supplies to their neighbors, found mostly in the U.S. Non-professional aides usually work on a part-time basis, and are often motivated on an incentive basis.

* Another example of a quasi-professional aide is the "barefoot doctor" of China, who is selected by his fellow villagers to undergo three to six months of health/family planning training, and then returns to his village to provide health services to his peers (Rogers, 1973). Three Asian countries have recently launched pilot projects with barefoot doctors: Bangladesh, Indonesia, and Iran.

From experience with aides in the national family planning programs of Pakistan, Indonesia, Taiwan, and Korea (Rogers, 1973, Chapter 4), the following conclusions are drawn:

1. Aides cannot effectively carry the entire responsibility for client contact in a national program of change. For example, from 1965-70 in Pakistan, 32,000 dais (traditional midwives) were utilized as the front-line field workers for family planning. They failed because their supervisors could not control them, they had little client contact, low technical competence, and they had a conflict of interest with their birth-delivery services from which they gained most of their income. However, in Indonesia, India, and Malaysia, where traditional midwives are utilized for promoting family planning along with more professional change agents, results have been more encouraging (Rogers and Solomon, 1973).

2. Aides pose difficult problems in recruitment, training, and supervision due to their heterophily with professional change agents. As Figure 6 shows, aides are more homophilous with their clients, and hence more heterophilous with professional change agents. Because most traditional midwives are illiterate, it is difficult to provide formal training programs that hold their attention. Instead, family planning officials have been forced to design demonstrations and on-the-job practice sessions of relatively short duration, so that the brief attention span of the midwives is not exceeded.

3. Compared to a professional change agent, an aide may have

less competence credibility, but a greater degree of safety credibility.*

Certainly an aide has less technical expertise than his professional counterpart, but he must have somewhat more than his clients to know what he is talking about (the aide's competence credibility, in the eyes of his clients, must at least be sufficient). But the aide excels (over the professional) in persuasive ability because he is a near-peer, and this gives him safety credibility. He is enough like the client to serve as a comparable role model. If the aide has already adopted the innovation that he is promoting, his experience heightens his safety credibility in the eyes of his clients. They feel that he really knows what he is talking about. From his personal experience, rather than from formal education.

For instance, in Taiwan, Lionberger and Chang (1970) found that the most effective agricultural extension agents were better educated and more technically competent than their peasant clients, but were perceived as highly credible because they operated farms and would not recommend an innovation to their clients until they had previously adopted it on their own farms. In the U.S., extension agents have always been forbidden to operate a farm because of concern over a possible conflict of interest. The Taiwan research suggests that the U.S. extension services may have been missing an important basis for the safety credibility of their change agents.

* Analyses of the perceptions of sources by receivers have found several dimensions of credibility, including competence, safety, and dynamism (Berlo and others, 1970).

Repetto's (1969) analysis of vasectomy "canvassers" in Madras State in India shows they were highly effective nonprofessional change agent aides because (1) they were of extremely low socio-economic status, just like the clients they persuaded to adopt, and (2) they had previously had the sterilization operation. When they showed a potential adopter their operation scars, they were able to say "Look here, I know what I'm talking about." Such experiences produce safety credibility in the eyes of the villagers. Repetto found that the personal experience of the aides was much more effective in persuading clients than professional family planning workers who had superior technical training, but who could not speak on the basis of first-hand knowledge of the innovation.

4. For maximum communication effectiveness, a change agent aide should be homophilous with his clients on variables relevant to the situation (such as socio-economic status), but he may be heterophilous on irrelevant variables, and somewhat so on technical competence. The implication of this generalization for development programs is to select aides who are widely-known in the local community in which they will be employed, and who are generally similar in socio-economic status, education, etc. to their clients.

Marginality and Inauthentic Professionalism

Most change agents face problems of marginality because their main function is to provide linkage between their clients and the change agency, two very unlike systems. Caught between the conflicting demands of these two systems, the change agent is marginal to both. He has one

foot in the world of his clients, and the other foot in the bureaucratic change agency, as we pointed out previously.

Such role conflict is especially severe for the aide. He has neither the personal power nor professional security to protect himself from the conflicting demands of his clients and his supervisor. Problems of identity and loyalty thus arise for the aide.

In order to resolve such difficulties, aides often mimic the appearance, language, and other behavior of the professional change agents with whom they associate. The professionals have higher socio-economic status, power and clán. They are usually admired by the aide, and provide a personal model for what the aide would like to become. The aide cannot attain the formal education and life style of the professional, so he copies the cosmetic aspects of the professional; he begins to dress and to speak like him. But such imitation may appear inauthentic in the eyes of the clients. They perceive the aide as pretentious, as defecting from client norms and values. So the aide loses his safety credibility with his clients, due to his inauthentic professionalism. We define inauthentic professionalism as the process through which a non-professional takes on the dress, speech, or other identifying marks of the professional in his field, often to the detriment of his relationship with his clients.

On the basis of numerous cases, we conclude that:

Due to their marginality, change agent aides often tend toward an inauthentic professionalism which decreases their homophily with clients and thus the safety credibility with which they are perceived.

How can aides avoid the trap of inauthentic professionalism which weakens their effectiveness? First, they can be made aware of the problem in pre-service and in-service training. Many aides do not seem to realize that they have fallen into inauthentic professionalism, perhaps because it is such a gradual process. Second, aides who become inauthentically professionalized may have to be replaced.

Working Through Opinion Leaders

If change agents would concentrate their activities upon the 10 or 20 percent of villagers who are the most important opinion leaders, they could indirectly reach many more clients. Opinion leadership is the degree to which an individual is able informally to influence other individual's attitudes or overt behavior in a desired way with relative frequency.

The most important single change strategy advocated by diffusion researchers is that of working through opinion leaders. The typical change agent in a less-developed nation has from 5,000 to 10,000 villagers as his assigned clients. How can he directly contact each of them? He cannot. But he can reach his target audience indirectly through contacting a smaller number of village leaders. A great efficiency can be achieved by working through opinion leaders, rather than trying to contact every client. A leader approach multiplies the change agent's efforts. He can communicate new ideas to a few leaders in a system, and then let word-of-mouth channels spread the innovations from that point.

The formal leaders that exist in peasant villages are readily identifiable. There is usually a village council, there are teachers, and religious leaders. But more important for the effective diffusion of new ideas is the ability of change agents to identify and work through informal village leaders. These opinion leaders are somewhat more difficult to recognize, but they are more influential in facilitating diffusion. Of course some informal opinion leaders may also be formal leaders.

There is another reason that change agents should work through village opinion leaders in diffusing innovations. Many clients, especially those who are less innovative, less educated, and of lower socio-economic status, do not trust the change agent, nor place credibility in his advice. So the change agent must reach these clients, who need his help the most, indirectly by using opinion leaders as intermediaries. Opinion leaders offer a method by which the change agent can bridge the heterophily gap and the credibility gap, between himself and his clients. The opinion leader is often part way between the change agent and his typical clients in education, technical competence, socio-economic status, etc.

Sometimes, agricultural change agents think that any farmer with whom they work intensively automatically becomes a "leader." This represents a mistaken idea of how leaders come into being. Leadership depends upon followership.

The most valid method of identifying opinion leaders is to ask all of the members of a village system who they look to for information and advice about agricultural innovations. A complete sociometric survey

would require considerable effort by a change agent. A short-cut method is to obtain opinion leader nominations from a small number of key informants who are well-acquainted with the village, such as priests, school teachers, etc. Evidence from the Diffusion Project in Brazil, Nigeria, and India indicates that such key informants can usually identify village opinion leaders almost as accurately as can be done by the full-blown sociometric approach (Rogers and others, 1970).

Findings from the Diffusion Project, and other researches, generally show that one of the main roles of opinion leaders in diffusion is to link their village with external systems, the source for most new farm ideas.

1. Opinion leaders are characterized by greater change agent contact, cosmopolitanness, and mass media exposure, than followers.
2. Opinion leaders are more accessible to followers than the average member of their system.
3. Opinion leaders conform more closely to the system's norms than do their followers.

Caution must be taken not to identify someone as an opinion leader who is too different from his followers. For instance, the ideal opinion leader is somewhat more innovative than his followers, but not so much so that they are too different. If opinion leaders were innovators (the first to adopt new ideas), they would not be acceptable role models for most of their followers, and there would be an heterophily gap between leader and followers, much the same as for the professional change agent and his clients.

The exact nature of opinion leadership varies on the basis of the norms of the system. For example, in villages where the norms are traditional, opinion leaders are relatively less innovative. But in modern systems, the opinion leaders may be more innovative. In a modern village, opinion leaders are more likely to seek information from technically competent sources such as change agents, than are opinion leaders in a traditional village.

Leaders obtain and maintain their position of influence by rendering valuable service to the system, in that the leader thus provides a living model of the norms for his followers. "A man of high status (that is, of opinion leadership) will conform to the most valued norms of his group as a minimum condition of maintaining his status" (Homans, 1961, p. 339). When a social system's norms favor change, opinion leaders are more innovative, but when the system norms are traditional, opinion leaders are not innovative.

Often, agricultural change agents try to work through opinion leaders, but fail to do so because they fail to select the right individuals as leaders. One common mistake is to select highly innovative farmers, who are the first to adopt new ideas, in the erroneous belief that such individuals are leaders. Actually, in very progressive villages, such innovators may also be opinion leaders, but in traditional villages such innovators are perceived as deviants, and the real opinion leaders are not at all innovative.

For instance, a Colombian village that the author once studied was quite traditional, as were the village's leaders, until extension

agents began work in the village. The opinion leaders, who were the oldest men in the village, refused to cooperate with the change agents, perceiving them as a threat to their position. So the extension agents worked intensively with a younger generation of emerging leaders in the village. They started a cooperative, improved a road into the village, introduced fertilizers and new crop varieties, and constructed a pipeline for portable drinking water. Within five years, the old leaders had lost most of their followers to the upcoming younger leaders. As the village norms changed from traditional to modern, the opinion leaders had to change so as to represent the new norms, or else be replaced by opinion leaders who subscribed to the new norms.

One example of the use of opinion leaders by agricultural change agents is in the "mobile schools" of the Agricultural Extension Service in Guatemala. A mobile school consists of a full-time coordinator who travels in a vehicle to a local village for a three-day course, which is offered once each month (for four months) to a class of about 50 farm leaders. The participants are selected by local extension workers, and must be literate in Spanish; thus most are ladinos, even in predominantly Indian areas. The participants are provided free transportation to the mobile "school" and living expenses for the three days. Five mobile schools are presently operating in various regions of Guatemala. Each reaches about 22 communities and 1,100 farm leaders per year (less than 1 percent of all the farmers of Guatemala). During 1973, the program was expanded to seven mobile schools, reaching some 140 communities and about 9,000 farmers during the year.

A total of 18 subjects is offered by the mobile schools, such as corn-growing, cooperative organization, agricultural credit, etc. The four different subjects that are taught to the 50 participants in a single course are selected (by the coordinator) on the basis of the leaders' interests and needs. Few bulletins, films, or charts are used in the teaching in the mobile school classes. However, use is made of demonstrations and practical work. Little follow-up has been done by local extension workers in the communities when the participants return to their homes, but this shortcoming will be rectified in the future. The cost per participant trained is about \$15 (U.S.), which is less than the \$22 (U.S.) per participant trained in the Agriculture Extension Service's resident training centers (where farm leaders come for one five-day course at a central location), but certainly more than the cost per farmer of the usual extension agent approach in the field.

<u>Method of Extension</u>	<u>Number of Communities Reached per year</u>	<u>Number of Individuals Reached per year</u>	<u>Cost per Individual Reacher per year</u>
1. Mobile Schools	140	9,000	\$15 (U.S.)
2. Training Centers	110	8,000	\$22 (U.S.)
3. Extension agents (working in local communities)	<u>250</u>	<u>16,000</u>	---
Totals	500	33,000	

What implications do the mobile schools of the Agriculture Extension Service in Guatemala hold for agricultural development in general?

1. Resident training centers for development purposes can effectively

train a relatively small portion of the rural population who are presumably leaders, but they could have a greater impact if such intensive training were combined with organized strategies to further diffuse the innovations to other individuals within the leaders' communities. Without attention to further spreading of the innovations within such communities, the mobile schools face the possible criticism of being an elitist program. For instance, it seems that the mobile schools are not effectively reaching the majority of the rural population in the Guatemala highlands who are Indians.

2. Electronic media channels and/or audio-visual recording equipment could be utilized to replace, or at least supplement, the relatively costly coordinator function to bring innovations to the local mobile "schools."

3. Visual media could be utilized in the mobile "schools" to increase teaching effectiveness.

The mobile schools are an important attempt by the Agricultural Extension Service of Guatemala to reach village opinion leaders with a relatively formal, in-depth training course. Several other Latin American nations such as Costa Rica and Honduras, have launched similar mobile school programs in recent years.

INTERPERSONAL COMMUNICATION FROM PEERS

We have previously summarized the numerous researches that show that most agricultural diffusion in less developed countries is via interpersonal communication channels. In the previous section, we

showed that one such type of interpersonal diffusion is from change agents and/or aides to their clients. This change agent-client contact is especially important in launching the diffusion of an innovation in a village.

But once an innovation has penetrated a village, the most frequent subsequent diffusion channels are from farmer-to-farmer. The satisfied adopter is a crucial ingredient in the intra-village diffusion of an innovation.

In spite of this fact, many agricultural development programs operate with very little understanding of such interpersonal communication among peers, and pay little attention to it. Such communication is not publicly visible, and it may not be easily manipulable by change agency officials.

In this section we deal with three specific aspects of peer communication: Discontinuances, rumors, and diffuser incentives.

Discontinuances

A discontinuance is a decision to cease use of an innovation after previously adopting it. Theoretically, there are two types of discontinuances: (1) disenchantment discontinuances, due to dissatisfaction with the performance of an innovation as when a new seed variety fails to produce the promised yield, and (2) replacement discontinuances, due to a better idea superseding the original innovation. An example of the latter occurs in family planning situations when a woman discontinues the IUD in order to adopt the pill, or in agriculture when IR-20

replaces IR-8 rice variety.

Lapham and Mauldin (1972) report startlingly high rates of discontinuance for the IUD within two years of insertion: 62 percent in Korea, 51 percent in Hong Kong, and 46 percent in India. Most of these discontinuances are due to disenchantment. Why?

When an innovation diffuses, whether in family planning or agriculture, we expect that considerable public opinion in favor of the innovation will build up. This favorable sentiment does result with most innovations, but a body of opinion favoring discontinuances may also develop. For example, it has been found that discontinuers talk more than do continued (or satisfied) users of family planning ideas. If a peasant did talk about a family planning method, he was more likely to condemn it than to support it. So negative reports "tended to travel more quickly and over a larger area than positive reports ..." (Marshall, 1971, p. 164).

When plotted over time, more and more innovation negativism (the degree of perceived failure of an innovation) builds up, so that a plateau soon occurs in the rate of adoption. A discontinuance is especially serious in a communication sense, because each discontinuer is likely to broadcast negative messages about the innovation to other members of his system. A discontinuer also is probably regarded as having high credibility by his peers because of his previous experience with the innovation. Soon, the communication environment contains as many negative messages about the innovation as it does positive influences. It is futile to focus completely on initial adoption of an

innovation when "back-door" discontinuances lose adopters as fast as they are gained.

The rate of discontinuance of various agricultural innovations has seldom been studied, but it probably is much less than in the case of family planning in Asia. Usually, agricultural development agencies only feature the number of initial adopters of various agricultural innovations in their annual reports. Less attention is paid to sustaining continued use. Local change agents devote little effort to reinforcing previous adoption decisions by their clients.

But the danger of failure for change programs posed by adopters who discontinue because of disenchantment augers for more concern with discontinuance behavior by agricultural development agencies.

Rumors

Unfavorable rumors about innovations can spread via word-of-mouth channels with wild-fire speed, and thus encourage discontinuance. The rapidity of rumor-transmission is indicated by the expression for rumor in the language of Indonesia: "Kabar angin" ("news from the wind"), or desas desus. A rumor is an unconfirmed message passed from person to person. Whether a rumor is true or false cannot be substantiated when it reaches a receiver; it is this lack of confirmation that marks a rumor as distinct from other messages. We often tend to think that rumor-transmission necessarily involves a loss of message accuracy and increased distortion with retelling; in short, that all rumors are false. This tendency toward inaccuracy does occur under laboratory research

conditions when communication flows are from one individual to another to a third in a linear chain. Studies of rumor flow in field (rather than in laboratory) situations, however, suggest that message accuracy may actually increase with transmission. This depends on whether the idea is relatively simple or complex, the degree of redundancy in message reception (that is, how many different sources transmit the rumor to a given receiver), and the critical ability of the receiver to judge message accuracy (Buckner, 1965).

Three principles of rumor transmission that may affect the diffusion of innovations are:

1. Rumors arise about matters of salience to individuals, but they deal with issues which are largely outside of the individual's control. When the Agriculture Extension Service introduced chemical fertilizer in Eastern Nigeria a few years ago, many villagers believed a rumor that fertilizer caused yam-rot. Unfortunately, yam-rot broke out in many villages at about the same time that farmers first used fertilizer, and this coincidence led peasants into thinking it was a cause-effect relationship. The Extension Service effectively combated the yam-rot rumor with radio programs, and by launching a campaign for use of aldrin to control the disease.

2. Rumors arise in unclear and unstructured situations, where confirmation is difficult or impossible, because there are no convenient, credible sources to negate (or confirm) the rumors. Such unstructured situations may occur when villagers learn of an innovation; its newness leads to ambiguity. When receivers lack "principles" knowledge under-

lying an innovation (such as understanding the chemistry of fertilizer effects on plant growth), rumors are more likely to thrive.

3. Once the central theme of a rumor is accepted, there is a tendency to reorganize and distort parts of the message so as to be consistent with this theme. If a villager believes the rumor that fertilizer causes yam-rot, he might then perceive other innovations promoted by the same change agent as damaging to his crops. Rumors function, in part, as self-fulfilling prophecies.

Rumors may be launched by someone who is especially opposed to an innovation. Fluoridation, a process for chemically treating water supplies to prevent tooth decay, has been rejected in many United States communities because an organized resistance initiates rumors (for instance, that fluoridation is a rat poison) which spread quickly through a relatively uninformed public. Pro-fluoridation experts feel these rumors are too absurd to be dignified by a response, and by not exposing the rumor, frequently lose the public referendum on the fluoridation issue. Similarly, a study in India showed that many of the IUD rumors in family planning programs were initiated by traditional midwives who were losing part of their baby-delivery income due to the use of contraceptives. Some rumor-mongers have a vested interest in initiating and spreading such messages.

A development program need not be a helpless victim of rumors. We recommend: (1) the early identification of rumors, and direct attack at the source, (2) emphasis on follow-up contact with adopters, (3) rumor-prevention through providing high quality agricultural development

services, and a two-sided presentation about innovations (in which the disadvantages, as well as the advantages, of the innovation are discussed), and (4) avoiding rumors through a more careful choice of wordsymbols and graphics for explaining the innovations.

1. Early Identification

A novel aspect of rumors is that they are largely invisible and unknown to change agents. Rumors are usually concerned with the negative aspects of a change agent's program and negative messages usually do not reach him. In Indonesia, the author once observed that rumors often spread among family planning patients in clinic waiting rooms, leading some potential adopters to leave the clinic before receiving treatment. Waiting rooms are a potent place for rumor-transmission to take place because clients are generally uneasy and anxious, and sometimes spend long periods of time waiting to be attended.

Rumors might be counted in clinic waiting rooms by using this opportunity to present supporting messages about the innovations. In some family planning clinics, films are shown to the clients or a change agent aide sits in the waiting room to counter negative rumors among the clients.

Officials should expect unfavorable rumors to occur and be prepared to deal with them, rather than being stunned when they happen. Needed is a means of early detection of such rumors, and a communication channel through which to counter them rapidly. "A sensitive network of listening posts should be established which will pick up rumors as soon as they arise and feed them to the appropriate agency meant for fighting them" (ECAFE, 1969).

2. Follow-Up of Adopters

One of the surest means of controlling rumors is through proper follow-up of individuals who have adopted. Follow-up amounts to providing reinforcement after adoption, when the adopters' experience with the innovation to date can be assessed, reassurance provided, and rumors discounted.

3. High Quality Agricultural Development Services and a Two-Sided Presentation.

One type of "preventive medicine" against rumors is to provide a high quality of services in the first place. For instance, many failures in introducing new fertilizers or herbicides are due to incorrect application, resulting from a lack of care in teaching farmers the correct procedures.

Further, we feel it is much better to warn adopters of the possibility of unfavorable side-effects at the time of adoption, than to imply that no side-effects can occur. We advocate a two-sided presentation by change agents in which the innovation's disadvantages are also mentioned.

4. Word-Symbols and Graphics

Part of the cause, and a potential for prevention, of some rumors lies in the word-symbols used to identify them. In many cultures there is no comprehension by villagers of pictorials commonly used by more educated people. Arrows, insets, and enlarged diagrams of insects, plants, and animals are misunderstood because of this different perspective. Caution should be used in the verbal and pictorial presentations offered the clients so as not to confuse, but rather to

adequately demonstrate, the proper meaning of the innovation. For instance, we wonder whether chemical terminology such as "aldrin" or "superphosphate" has meaning to villagers, especially when English terms or cognates for these innovations are used.

Diffuser Incentives

Incentives have been most successfully used in the diffusion of family planning innovations. An incentive is a direct or indirect payment in cash or in kind given to an individual, family, or group in order to encourage an overt behavioral change. Diffuser incentives are paid to a previous adopter so that he will promote the innovation with his peers. Diffuser incentives increase the rate of adoption of an innovation by encouraging interpersonal communication among peers about the innovation.

A promoter who has adopted an innovation, who is similar to the potential adopter in socio-economic status, life style, and attitudes, and who is a trusted friend, can be a great motivating force for adoption of new ideas. Thus, diffuser incentives increase the degree to which the results of an innovation are visible or communicated to others (Rogers and Shoemaker, 1971).

Repetto (1969) found that vasectomy canvassers in India shared many characteristics with the adopters, who were poor, illiterate, low-caste, agricultural laborers or urban manual workers, least knowledgeable about family planning methods, and least accessible through the conventional promotional approaches. The canvassers' identification,

as evidenced by dress and life style, is "not with the lower civil service but with the common man." Interestingly, there are pressures from these canvassers for guaranteed wages, uniforms, badges, and other marks of status, perhaps suggesting a desire to shift their identification to being more like government family planning employees. This is inauthentic professionalization. Such a shift would, of course, widen the perceived gap between canvassers and potential acceptors, and probably decrease the effectiveness of the canvassers.

All of the canvassers that Repetto (1969) studied had been vasectomized themselves. A crucial point in the decision process occurred when the canvasser showed his operation scar to potential adopters as evidence that the sterilization was physically insignificant and that the canvasser knew what he was advocating. The canvassers ranged over a 100-mile radius to search for adopters and worked a six- or seven-day week, at a task publicly viewed as having very low prestige.

Diffuser incentives are one way to motivate non-professional change agent aides to actively influence their peers about an innovation they have previously adopted.

THE POTENTIAL OF NEW COMMUNICATION TECHNOLOGY

In some respects it is inappropriate to discuss the potential of such new communication technology as satellite television, super-8 films, tape playback units, etc., for agricultural development programs. This is because most agricultural change agents have not yet learned to use the more obvious audio or visual mass media channels (such as flip charts, films, radio, or newspaper, etc.). The typical agricultural change agent uses very little communication technology. He contacts

farmers in home visits or office calls, and he may lecture at a farm demonstration or a group meeting. But in none of these communication activities does he use any oral or visual media to increase his teaching-learning effectiveness. He has not been trained in how to use such media, nor has he been provided with the necessary equipment. He is clearly not motivated to use such communication technology.

So to discuss change agent use of new communication technology may be an exercise in futility. He is not yet using the "old" communication media. Nevertheless, we here present some of the promising new media with potential for facilitating agricultural development.

Satellite Television

For most of the past decade, there has been much hopeful talk about the potential of using satellite television for village modernization. However, a specific plan for the use of this medium exists only in India and Brazil. Further, and much more significantly, there has been almost no research evidence on the impact of non-satellite television broadcasting in rural development in less developed nations. Nor have any television programs been produced that are intended to facilitate agricultural development in villages (except the Krishi Darshan program in India).^{*} So television is largely an unresearched and unproven tool for agricultural development purposes. But in several countries like India, Colombia, El Salvador, and Mexico, television is used for classroom teaching on a national basis.

Many less developed countries have commercial or public television

^{*} And the Programa Campesino in Mexico, which began using TV forums on a pilot basis in 1971.

broadcasting that covers vast sections of their countryside. The programming is extremely urban-oriented, and almost all of the receiving audience, who are able to afford the cost of a receiving set, are urban elites.

In addition to prohibitive costs, another reason for the lack of exploration of the potential of television for agricultural development purposes lies in the great difficulty of producing interesting and relevant television programs for village audiences. The peasant farmer is so unlike the television program producer that the latter has extreme problems in empathizing with the villager. Further, the television communicator knows little or nothing about technical agriculture. Likewise, agricultural development personnel know little or nothing about television production techniques.

One attempt at using television for rural development is the Krishi Darshan program broadcast by the Delhi station of All-India Radio. This half-hour weekly program is carried at prime time (7:00 p.m.), following the most popular television program on the Delhi station (of Indian film music). Dr. Sharma, an agriculture extension educator at the India Agricultural Research Institute near Delhi, works with television station personnel in producing Krishi Darshan. The program began in 1967 in order to test the potential of agricultural television, for eventual use with satellite television broadcasting. At present Krishi Darshan can be received in about 70 villages near Delhi that have been provided by the Indian government with television sets for group reception.

Several communication researches have been made of the effectiveness

of Krishi Darshan with these rural audiences. The results are disappointing. They show:

1. About half of the watchers are small children.
2. Few adult farmers view the program on a regular basis, and they rate the content as rather low in interest.
3. The program content is heavily message-oriented (usually consisting of interviews with an agricultural expert), rather than being receiver-oriented (seldom is a villager who has experience with an agricultural innovation shown, for example).

Yet a communication study by Parris (1971) indicates that the latter type of program content is perceived by Delhi area villagers as more credible, and it was more effective in changing their attitudes toward the innovation presented on television.

The immense problem of providing appropriate programming that is both attention-holding and instructional is illustrated by Dr. Eliho Katz (1973), who was the founding Director of Israeli Television. He asks us to imagine the introduction of television in the typical developing country. The prime minister or the president announces that television is being introduced, despite its high cost, in order (1) to integrate and unify the nation by overcoming ethnic and regional differences, (2) to encourage indigenous cultural creativity, and (3) to spur economic development. "Six months or a year later, the broadcasts

begin and the programs are I love Lucy, Bonanza, and Mission Impossible: there is very little, if any, evidence of programmes which reflect the goals originally proclaimed by the prime minister."

The government of India is proceeding with plans for a large-scale experiment with satellite television broadcasting to villagers in 1973-74. Television sets (about half with dish antennas for direct reception from the satellite) are to be provided to about 5,000 villages for group reception. The four hours of daily TV programming will feature family planning, agriculture, and national integration.

There are, however, no plans for organizing viewing forums in these villages, despite communication research (reviewed previously in this report) which suggests that forums would greatly increase the impact of the programs. Further, television forums would provide feedback about program effectiveness, which is much needed when the source (broadcasters) and the receivers are so heterophilous. Lastly, the television programming should be supplemented and coordinated with the work of local agricultural change agents, but this has not been planned for India. We conclude that: Satellite (and non-satellite) television broadcasting for agricultural development purposes offers a great potential, but one that has not yet been demonstrated in less developed nations.

Tape Players

A tape player is an audio device which will play back a cassette or open-reel tape, but does not record. Tapes can be developed for assisting the change agent in describing or explaining an innovation to

his clients. Often the use of some form of electronic medium draws attention on the part of villagers. For instance in Pakistan, a female change agent aide takes a tape player to the village well, where she knows that women gather to wash their clothes and gossip. She plays a family planning tape which begins with some loud music to attract interest. A dialogue follows for 10 minutes in which two women discuss the use of contraceptives, presenting a two-sided message. A conclusion is not reached by the taped voices, but an awareness of family planning is created and audience involvement in discussion of family planning is then easily launched.

As the tape message is presented, the agent is free to use visual aids or demonstrations. The agent's oral message is augmented by the taped message, which is especially useful when the field staff are aides.

Importantly, the tape player is a means of supplementing the change agent's oral efforts. It is a move toward a multimedia approach. Seldom have tape players been used in this way by agricultural change agents in developing nations.

Simplified Communication Technology

Remember the story of the boy fishing with a bent pin and catching all the fish, while the well-outfitted angler with all his technology, could not get even a nibble? Often in searching for means to effectively convey an innovation, the point of this story is missed. It is not the degree of sophistication of the communication technology which determines the effectiveness of the message, but the relevancy

of the channel to the audience.

Perhaps if change agencies looked for more of the simplified "bent-pin" communication methods, they might "catch" more clients. Impressive as is much of the newer communication technology, the basic needs are for equipment that is durable, foolproof, and low-cost. In the 1920's in the U.S., a car battery was used in some rural communities to run a motion picture projector, with the side of a building as a screen. A slide projector is now available which uses a flashlight lens apparatus,* a radio with a candle for power, etc. Little utilization is made of these visual aids in agricultural development programs, partly because of lack of knowledge of their existence. Often their non-use is due to a lack of training of change agents in basic principles of audio-visual media utilization.

We feel that many agricultural development agencies have an urgent need for simplified communication technology. Flip charts. A simple cassette tape player. Maybe a few colored slides. Media like these are flexible and adaptable. The change agent can produce his own. The cost is low. And the potential, we feel, is high.

IMPLEMENTATION OF COMMUNICATION STRATEGIES

As mentioned previously, several nations including Colombia and El Salvador have initiated a national educational television program in recent years. A consistent problem in these programs has been to over-

* This is the "Crusader" projector, which sells for about \$10 (U.S.) in bulk orders.

come classroom teacher resistance to the television programming. Naturally, the teachers fear that the introduction of the televised materials in their classroom is a step toward replacement of the teacher with the new communication technology. At the least, the teacher feels his role will be changed (and it certainly will). So one of the greatest barriers to the effective utilization of classroom television is the classroom teacher.

The introduction of communication strategies for agricultural development is a direct parallel. Some local change agents will feel they are being at least partly replaced by such strategies as media forums. Certainly their role as a change agent will be modified. We may expect considerable resistance from change agents to many of the communication strategies spelled out in the present report. They have not been trained in the use of these strategies. Often they have not been trained in the use of any strategies. Often they have not yet seen a successful demonstration of these strategies. Almost certainly they are not accustomed to thinking in terms of communication strategies.

The administrators of agricultural development agencies can hardly be expected to welcome eagerly most of these communication strategies. Many require an expanded budget, the purchase of new equipment, and the hiring of different personnel. Some strategies necessitate the restructuring of the change agency. Most development organizations, devoted to changing the behavior of others, are remarkably resistant to change themselves.

So how can the communication strategies suggested in this report

be effectively introduced to agricultural development agencies?

We feel that one place to begin in any developing country is with the training centers which provide pre-service training to agricultural change agents. Usually this is a college of agriculture and/or an extension training center. Emphasis should be given to persuading the trainers of change agents to use these communication strategies. For instance, once future change agents have been taught with flip charts, they will be more likely to use these visual aids themselves. Further, it is obviously important to see that future change agents are trained in communication strategies, including such topics as how to identify village opinion leaders, how to work with groups, and how to obtain and use feedback. Once a number of change agents are properly using communication strategies, widespread adoption of the new approaches may be expected.

Change agency administrators must grant approval if certain strategies are to be utilized. For instance, a radio forum program cannot be launched without the approval of top leaders. The appeal to such program executives must be mainly on the basis of improved efficiency from program inputs. Unfortunately, little data on the relative cost-effectiveness of present versus proposed communication strategies is available.

A strategy, successfully demonstrated in one country, will soon spread to others. For instance, the idea of mobile schools has spread throughout most of Central America within the past few years.

International technical assistance agencies may be able to facilitate

the favorable trial of communication strategies for agricultural development, through providing advice and resources.

Present utilization of communication strategies for agricultural development, as we have made plain in this report, is far from perfect. They are a missing, crucial ingredient in agricultural development. A first step toward amelioration of this situation is the identification of such strategies. The present report is but the beginning of a move in this direction.

SUMMARY

The purpose of this report was to synthesize communication strategies for agricultural development. Communication is the process by which an idea is transferred from a source to one or more receivers, with the intent to change their behavior. A communication strategy is a plan or a design for changing human behavior on a large-scale basis through the transfer of new ideas.

In the past, many agricultural development agencies have followed such erroneous strategies as (1) the large-volume error that the more messages produced, the better, (2) an over-dependence on mass media (and on agricultural change agents), (3) an over-dependence on "modern" channels, and (4) lack of a multi-media approach. Unfortunately, mass media channels in less developed countries often have (1) a limited exposure on the part of peasant farmers, (2) irrelevant message contents, and (3) low credibility.

Agricultural development is a type of social change in which innovations are introduced into village systems in order to produce higher

per capita incomes and levels of living through more modern production methods and improved social organization. Most agricultural development programs (1) deal only with improving levels of agricultural production, rather than the distribution of incomes and levels of living, and (2) operate in an unintegrated and competitive way, forgetting that their clients' needs and problems are integrated.

A synthesis of the main contents of the present report is provided by the following generalizations about communication for agricultural development. Such generalizations provide a basis for developing specific communication strategies.

1. The effects of mass media communication channels among peasant farmers in less developed countries are greater when these media are coupled with interpersonal communication channels in media forums.

2. The traditional media have a great potential in achieving development goals because they have a wide audience and high credibility in the eyes of villagers.

3. Change agents interact most frequently with clients who are most like themselves.

4. As a bridge between two differing systems, the change agent is a marginal man with one foot in each of two worlds. His ability to link the change agency with his client system lies at the heart of the diffusion process.

5. Special attention should be given to recruiting professional change agents who come from a village background and who attain some practical farm experience prior to employment. The professional change

agent should enroll in courses on the theory and practice of social change, and in communicative skills. He should have a supervised field experience in living under the same conditions as his village clients, in order to increase his empathy for their situation.

6. For maximum communication effectiveness, a change agent aide should be homophilous with his clients on variables relevant to the situation (such as socio-economic status), but he may be heterophilous on irrelevant variables, and somewhat so on technical competence.

7. Due to their marginality, change agent aids often tend toward an inauthentic professionalism which decreases their homophily with clients, and thus the safety credibility with which they are perceived.

8. If change agents would concentrate their activities upon the 10 or 20 percent of villagers who are the most influential opinion leaders, they could indirectly reach many more clients.

9. A development program need not be a helpless victim of rumors. We recommend: (1) the early identification of rumors, and direct attack at the source, (2) emphasis on follow-up contact with adopters, (3) rumor-prevention through high-quality agricultural development services, and a two-sided presentation of innovations, and (4) avoiding negative rumors through a more careful choice of word-symbols and graphics for explaining the innovations.

10. Diffuser incentives increase the rate of adoption of an innovation by encouraging interpersonal communication about the innovation with peers.

11. The typical agricultural change agent probably does not use

any communication technology.

12. Satellite (and non-satellite) television broadcasting for agricultural development purposes offers a great potential, but one that has not yet been effectively demonstrated in less developed nations.

13. The tape player is a means of supplementing the change agent's face-to-face efforts. It is a move toward a multi-media approach.

14. It is not the degree of sophistication of the communication technology which determines the effectiveness of the message, but the relevancy of the channel to the audience.

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