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COMMUNICATION FOR TECHNOLOGY TRANSFER IN AGRICULTURE
(AID/S&T Project 936-5826)

C T T A

C T T A P R O J E C T M A N U A L

September 1986

The Communication for Technology Transfer in Agriculture Project is jointly managed and funded by the Offices of Education, Rural Development, and Agriculture of the Bureau For Science and Technology of the United States Agency for International Development in collaboration with Regional Bureau Technical Staff and the USAID Mission at each collaborating site. Technical Services are provided by the Academy for Educational Development under Contract No. DPE-5826-C-00-5054-00 as prime contractor, with Cornell University and Applied Communication Technology as subcontractors.

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SUMMARY:
The CTTA Project

The Communication For Technology Transfer in Agriculture (CTTA) Project is a five-year worldwide project of the Offices of Education, Rural Development, and Agriculture of the Bureau for Science and Technology of the United States Agency for International Development for which the Academy for Educational Development is the prime contractor. Cornell University and Applied Communication Technology, Inc., are subcontractors to the Academy. Collaborating institutions include Iowa State University, Needham Porter Novelli, Virginia State University, and the University of Wisconsin.

CTTA will collaborate with USAID Missions in up to nine countries of Africa, Latin America and Asia, with Honduras serving as the most intensive site. The nature, extent and mechanisms for collaboration will be jointly determined in each country in consultation with the USAID Mission, the host country government and the AID Bureau for Science and Technology.

Typically, a pilot project to introduce and test improved communication strategies and methods will be established in a selected region in each collaborating country. CTTA will seek to assist in institutionalizing these strategies and methods and extending them into other regions of the country.

The Project requires cost sharing between AID/Washington and the USAID Missions. Under the CTTA contract, local project activities can be directly funded by Mission Projects. These activities, although they may vary among countries, will typically include a long term communication advisor; some short term technical assistance; in-country operational expenses associated with the project's experimental nature; a case study evaluation; and participation in international meetings and diffusion activities.

CTTA will also selectively undertake less comprehensive technical assistance missions and can provide team members to participate in appropriate project development activities.

Conferences, seminars, workshops, magazine and journal articles, newsletters, and extensive interinstitutional and interprofessional contacts will be used for worldwide diffusion of project experience and results.

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CTTA PROJECT METHODOLOGY MANUAL

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ACRONYMS AND DEFINITIONS

ACT	Applied Communication Technology, Inc.
AED	Academy for Educational Development
AID/S&T	USAID Bureau of Science and Technology
BVE	Basic Village Education Project, Guatemala
CRSP	Collaborative Research Support Program
CTO	Chief Technical Officer
CTTA	Communication for Technology Transfer in Agriculture
FHIA	Fundacion Hondureña de Investigacion Agricola
IAP	Integrated Action Plan
IARC	International Agricultural Research Center
PIP	Project Implementation Plan
USAID	U.S. Agency for International Development

[To be expanded]

**Communication for Technology Transfer in Agriculture (CTTA)
(AID/S&T Project 936-5826)**

C T T A P R O J E C T M A N U A L

The overall CTTA objective is to develop and demonstrate a system and methodology for using communication support that integrates mass media (particularly radio and print) and interpersonal interaction to help attain widespread beneficial adoption by farmers of both low and high input technologies.

The project's communication goal is the adoption and institutionalization of a systematic communication strategy, and attendant procedures and methods, by the countries which participate in the project on a pilot basis. A worldwide goal is to diffuse the knowledge gained and methodology developed, both directly to other country officials and potential users, and to the international agricultural extension and research communities.

CTTA builds upon experience from agricultural extension and other communication projects in agriculture and sectors such as health and education. The strategies to be developed will integrate approaches and concepts from agricultural communication, extension and research; behavioral analysis; social marketing; instructional design; and development communications. The methodology and delivery systems will be designed and implemented to achieve high impact at a cost which will be affordable for sustained adoption by developing nations.

The project works with existing public and private sector institutions to develop effective communication networks, with particular emphasis on strengthening linkages among extension, research, the agrosupport sector, and farmers. Special efforts are made to include private and public sector organizations in project implementation.

The CTTA project does not anticipate the creation of new institutions, nor will it provide staff for communication program operations. The success of the project will largely depend in large part upon the ability of CTTA field staff to provide technical guidance in working with existing host country institutions and staff to develop, implement and manage effective programs based on the principles and methods described in this manual.

The purpose of the manual is to provide guidelines to CTTA field

staff, host country counterparts and USAID project managers in the planning and implementation of cost effective multi-channel communication programs to support technology development and transfer.

Chapter I

WHY CTTA ?

The Communication For Technology Transfer in Agriculture Project, as its name implies, uses an integrated communication approach to address a major problem in the developing world--technology transfer among small farmers. The problem is particularly acute where land quality, water supply, credit availability, purchased inputs, prices, and cropping systems vary significantly within a region and from season to season.

Extension institutions and programs for technology transfer exist in virtually every developing country. Yet, coverage of farm families is still limited, the quality of third world extension programs is being seriously questioned, and the transfer of potentially beneficial new and underutilized agricultural technologies continues to lag behind.

From an examination of developing country extension programs, Ray (1985) concluded that at least six major changes, all of which have relevance to CTTA, will be required to enable Extension to become an effective vehicle for technology transfer:

First, the extension program must be farmer-oriented; and the farmer must be and feel involved. . .

Second, linkages and coordination between research and extension must be strengthened. . .

Third, well-planned and appropriate multi-media communication strategies must be incorporated into the extension program. . .

Fourth, coordination within the extension program; between extension and research; and among the farmers, extension, research, and the providers of goods and services must be given high priority. . .

Fifth, constraints over which extension can have no control--land, agricultural infrastructure, government policies, etc.--must be taken into consideration in determining the technical content of the extension program. . .

Sixth, the reoriented, redirected and revitalized extension programs must be institutionalized. Compe-

tent staff must be placed and maintained in position, trained, and given experience during the revitalization process that will enable them to provide capable and imaginative leadership to extension programs in years to come. Governments must recognize the new roles and methods of extension, and provide budgetary and other support to maintain them. . .

The communication problem to be addressed in improving technology development and transfer programs in agriculture transcends the need to introduce the use of communications into the system. Information units commonly exist and mass media, audiovisual aids and printed materials are already being used. Rather, the problem is that application of communication skills, media and methodologies is typically ad hoc and fragmented, with no operative strategy for their integrated and mutually reinforcing use in support of the program.

The CTTA challenge is to develop and demonstrate effective communication strategies that use mutually-reinforcing media and face-to-face contacts integrated into the total program to increase extension's effectiveness as a technology transfer agent.

Chapter II

CTTA PILOT SITE SELECTION

Honduras is the primary site for the CTTA project. As of September 1986, CTTA implementation is starting in Peru as the first collaborating country site; and discussions are underway with Ecuador, Indonesia and Thailand as other potential sites. In all, the CTTA Contract specifies that the project will function in up to nine countries, including Honduras and Peru, in Latin America, Africa and the Asia/Near East Region.

AID has specified five major criteria for selection by the Contractor, with AID guidance, of the additional sites not yet identified. More detailed criteria have been developed for selection of a pilot region within each collaborating country and, if necessary, for subregions.

A. Country Criteria

The major criteria for selecting of additional CTTA collaborating country sites include:

- An existing AID agriculture program which could benefit from participation in the CTTA project.

Linkage of CTTA into projects or programs that address issues such as generating the information to be disseminated and that provide the conditions necessary to enable farmers to make desired changes in practices and behavior is essential to CTTA success.

- Clearly identified new or underutilized agricultural technologies ready for diffusion which imply a significant role for change in farmer practices in increasing production.

The CTTA project will not generate the new or improved technologies that are the first requirement for technology transfer. Therefore, it can have impact only in areas for which there are already underutilized technologies that can be adopted beneficially by farmers within the present institutional framework and within the farmers' own constraints. Although a continuing flow of new, adapted technology is essential

as stated in the next criterion, the limited duration of CTTA mandates that an initial supply be available at the outset to include in the developmental investigation and communication interventions.

- An agricultural research base that can provide a continuing supply of new adapted technologies.

Technology transfer is an ongoing process that requires continuing infusions of new or improved technologies to maintain the pace of agricultural development. The investment required to establish and institutionalize CTTA strategies and methodologies can be justified only on the basis that they will become an ongoing component of technology transfer projects and programs. An agricultural research system that can provide a continuing supply of new adapted technologies is therefore essential to the ongoing success of CTTA.

- Commitment from the host country government to further development of its communication activities for technology transfer.

CTTA will work largely through existing institutions and programs, and the host country government must assume a major responsibility for work associated with the communication intervention in the pilot sites. The Contractor's role is one of advisor and active collaborator in the pilot activities for each country.

- A pilot site with available, appropriate technologies and institutions, personnel, communication infrastructure, and research linkages capable of sustaining CTTA activity and contributing to CTTA objectives.

Pilot site selection criteria are presented in greater detail in the following section.

Selection of a collaborating country site involves assessment of numerous factors, and the overall situation will never be ideal. Nevertheless, the five criteria cited above must be substantially satisfied before CTTA can consider a country as a collaborating site.

B. Pilot Region Criteria

CTTA will typically focus on technology transfer objectives within a "lead" or pilot region within the collaborating country to introduce and test improved multichannel communication strategies and methods. Although the region should be relatively

non-complex, some variability is needed such as:

- a spectrum of variability with respect to lands, ecological characteristics, agricultural enterprises, roads, markets, credit, and other infrastructural features that is balanced by sufficient homogeneity to permit a meaningful evaluation of CTTA impact; and
- a spectrum of farmer variability with respect to (within the norms of the area) high and low resource availability, "traditional" and "progressive" attitudes and farming practices, size of farm, degree of isolation, present access to information sources concerning improved agricultural technologies, and other factors that influence receptivity to the technologies to be included in the communication intervention.

Geographic location is also important. Ideally, the pilot region should be far enough from national trade, research and government centers to be representative of other rural areas and population. It must, however, have a sufficiently developed agricultural infrastructure to provide the goods and services needed to enable farmers to adopt improved technologies beneficially, and to permit CTTA and national staff to be effective in developing viable information networks and linkages with research and agrosupport institutions. And it should have communication and transportation linkages with the capital city for maintaining close contact with Host Government and USAID officials concerned with the project.

The pilot region must meet the country criteria (as applied to the region), and the general criteria described above. In addition, the following conditions should be met:

- regional offices of the executing institution located within the region, and local personnel who can manage the different aspects of the pilot project;
- adequate regional institutional base (research, extension, other development agencies) for CTTA and collaborating institutions;
- sources of services, inputs, credit, and other supplies accessible to the farmers;
- markets and incentive prices accessible to the farmers;
- soil and climatic conditions appropriate for the development of agricultural production;
- regional agricultural research programs as sources of new technologies;

- adequate communication infrastructure, including radio stations and other communication channels which regularly cover the areas included in the pilot project;
- access and exposure to mass communication channels (e.g., radio, newspaper) by the potential audience;
- local institutional capacity to produce educational communication materials;
- few ethnic, cultural or linguistic variations which would increase the complexity of segmenting the target audience;
- absence of other projects, including external donor projects, that would significantly confound CTTA results;
- geographic location accessible to national headquarters to facilitate effective interaction with central staff.

Compromises will be required because it is unlikely that any region will fully meet all of these conditions. All must be taken into consideration, however, and decisions made concerning probable consequences to the project of deficiencies encountered. If estimated negative consequences cannot be realistically overcome and are of sufficient magnitude to jeopardize the possibility of the project to achieve its objectives, the region should not be selected.

C. Subregional Criteria

It is possible, if not probable, that the pilot regions selected will require further analysis and subdivision to provide appropriate units for intensive CTTA project activity. For example, the area for which a regional extension office is responsible may be too large and/or too variable to make it feasible for the CTTA methodology to be tested with all farmers. Or, radio reception may not be adequate throughout the region. Where such a situation arises, the areas for intensive project activity must be carefully selected on the basis of known characteristics and the results of developmental investigation.

Criteria for pilot region selection will still apply, supplemented with additional criteria identified during the developmental investigation.

Chapter III

BASIC ELEMENTS OF A COMMUNICATION PROGRAM TO SUPPORT AGRICULTURAL TECHNOLOGY TRANSFER

Three elements--consumer orientation, targeted change and interrelated communication--are fundamental to the process of developing an effective communication methodology for agricultural technology transfer.

A. Consumer Orientation

A basic premise upon which effective communication and social marketing programs have been designed is that the product must be shaped to meet the consumer's wants, needs and expectations. The "product" of a communication program for agricultural technology transfer is the information disseminated to achieve the desired behavior change; and the "consumers" are the farmers. This implies that the communication program must first consider the farmers who constitute its audience (the consumer) to determine what information (its product) will be of value and acceptable to them. Such a consumer orientation requires an understanding of the farmers and recognition that farmers are not all alike.

1. The farmer as an active participant

The farmer is an active participant whose needs, constraints, attitudes, and vocabulary must shape the communication program. He is not simply a receptacle into which new agricultural technologies are poured. In this context, communication is a link between the farmer and the researcher, planner and extension agent--not simply a link to the farmer.

Concept testing, focus group interviews, behavioral trials, and intercept interviews are sound village research techniques used by social marketing programs that CTTA will use extensively to help to identify the hidden constraints a farmer may encounter in trying a new innovation. They will also help to select vocabulary which the farmer will understand, and to integrate the innovation into the farmer's own view of his problems and needs. These new tools for understanding the farmer's perspective decrease the need for traditional survey research and anecdotal information on which earlier communication programs had to rely.

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2. Farmers are not all alike

Small farmers in countries collaborating with CTTA can be generally characterized as having severe resource constraints, being reluctant to assume risk, using minimal cash inputs, and frequently existing at or near the subsistence level. Not all farmers are alike, however. They differ greatly, even within a local setting, with respect to factors such as:

- socioeconomic and cultural characteristics,
- perceptions of risk,
- resource limitations,
- attitudes toward change,
- management and husbandry skills,
- modernization of their agricultural enterprises,
- readiness to accept new ideas and products,
- sources of information they consider to be credible,
- quality of the lands which they farm, and
- tenurial status.

In the past, communication programs tended to focus more on farmers' similarities than their differences. Packages of practices were developed for an area and recommended to all farmers, without taking into consideration the variability of farmers within that area or their perceived needs, constraints, desires, and attitudes. This approach was particularly evident in the use of broadcast media such as radio, which was widely thought to be impersonal and of value for disseminating only generalized information.

Now, experience in projects such as Basic Village Education in Guatemala and Mass Media and Health Practices in Honduras and The Gambia has shown that broadcasts can be personalized, segmented and directed at special groups. Differentiated message strategies for different groups or segments of farmers can be developed. Techniques such as message tone, characterizations, personalization, and scheduling can be used to localize the messages and reach important subgroups with relevant and persuasive information.

CTTA will base its communication strategies and methods on understanding the farmers, including the differences among them, and will orient the communication program toward their perspectives. Techniques such as those cited above will be used to personalize and direct mass communication interventions at specific groups of the farmer audience.

B. Targeted Change

The second basic element of an appropriate and viable communication methodology is targeted behavioral change which involves focus on selecting, organizing and prioritizing the content of agricultural messages to be disseminated. In social marketing terms, this means first identifying and establishing a definite organizational purpose with specific objectives which then guide message development.

In some instances--such as oral rehydration therapy for control of infant diarrhea--benefits from using a new technology may be dramatic and almost immediate. This is seldom the case in agriculture.

Farming is an integrated and cumulative process which is necessarily reactive to unpredictable events. Drought, floods, lack of credit, pest attacks, unexpected increases in input prices or drops in product prices, or any one of several other problems can obliterate benefits from even the most carefully applied new practice. Even if such disasters do not occur, the ultimate benefits of adopting a new technology are seldom evident until at least the end of the cropping season.

Clearly, messages must be carefully selected to ensure that the observable outcome is perceived as rewarding; but message content must also be realistic. Communication interventions must help the farmers to deal sequentially with seasonal needs and problems as they are encountered, and to understand the potential risks involved with the new technology compared to those encountered at present. In this context, simplistic media messages about the wonders of a new crop variety or other recommended technology may only produce frustrated and skeptical farmers.

The amount of information to be disseminated also is an important factor in deciding on message content. How much information can farmers be expected to absorb in a given period of time? (Developmental investigation and feedback will provide guidance.) From the program's perspective, how much information is the system capable of generating, transforming into presentations acceptable and understandable to farmers, and disseminating through its media network?

Difficult decisions are required concerning not only message sequencing and appropriateness, but also the amount of information to include. CTTA staff must carefully establish message priorities and focus the messages accordingly.

C. Interrelated Communications

No single communication channel or methodology is powerful enough by itself to make an effective program:

- Broadcast media, (e.g., radio and television) are better for reaching a lot of people quickly with fairly straightforward information or ideas.
- Print media are best for providing complex information and for timely reminders when people need to use the information.
- Interpersonal communication channels (e.g., extension agent contacts, group meetings, community organizations, demonstrations) are still the best way to teach and to develop credibility for new techniques.

All three components are needed to make an effective communication program. Large numbers of people must be reached quickly; they need a reference or reminder when they are ready to use the information; and they have to believe in the integrity and worth of the program if they are to heed the advice and information received. Effective communication is somewhat like a three-legged stool. With a leg missing, it is unstable and of limited usefulness.

The CTTA challenge in developing effective communication strategies and methodologies is to orchestrate the various possible communication inputs to maximize their total impact and to minimize costs. Not all channels can be used all the time because costs would be exorbitant. Elements must be selected from each of the media groups and integrated in a manner that results in a total impact that is far greater than the sum of the individual effects.

#

For additional information and guidance on consumer orientation, targeted change and interrelated communication, refer to

[to be added]

Chapter IV

THE CTTA COMMUNICATION PROCESS IN OVERVIEW

The CTTA multi-media program will be guided by a systematic strategy based on careful technology identification, developmental investigation and continuous monitoring through formative evaluation and feedback mechanisms. The strategy will include use of mass media, conventional interpersonal extension methods, and new materials and devices integrated into a mutually-reinforcing multi-media information delivery system.

The process through which the CTTA strategy will be developed and implemented is illustrated in Figure IV.1. It is an iterative process in which each step feeds into and is fed by every other step; and the ultimate success in its application will depend in large part upon the degree to which the communication support program is integrated into the total extension program.

A. Investigation

The first requirement for technology transfer and, consequently, the communication support program is a continuing supply of appropriate and well-adapted technologies that will increase farmers' production and profits. Knowledge and understanding of the farmer are equally critical. Therefore, the communication process begins with evaluating the agricultural technologies and studying the farmers.

1. Technology identification and assessment

The biological potential and technical feasibility of potentially appropriate new and currently underutilized agricultural technologies must be carefully assessed. Selection of those which will be used in communication interventions involves much more, however. Each must also be assessed from the farmers' perspective. They want to know:

- Is it dependable? Has it been tested in their region?
- Will it be economically beneficial?

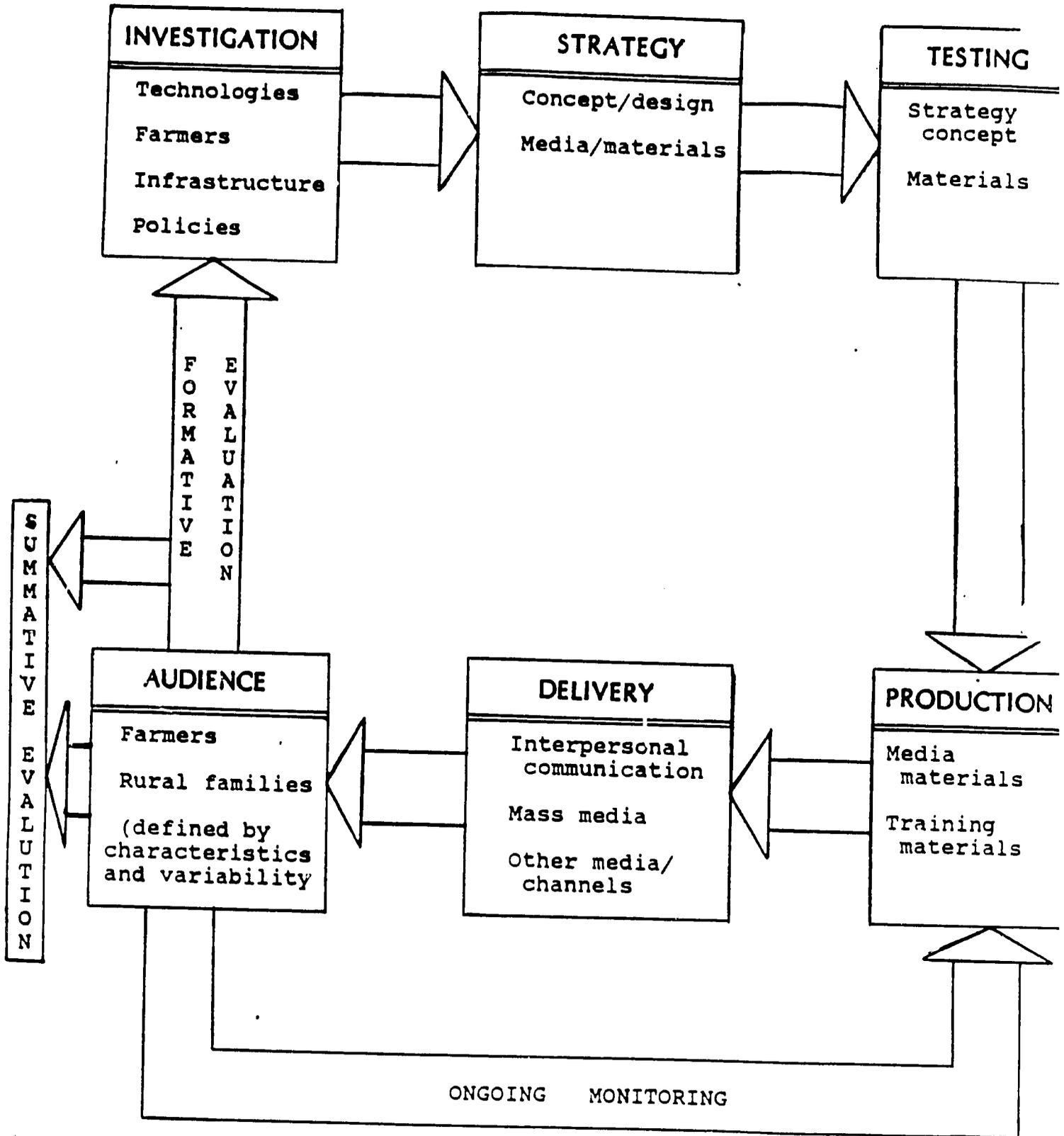


Figure IV.I. The CTTA communication process.

- Is it practical--considering their limitations of resources, power, equipment, labor, management skills, and access to inputs and markets?
- How much risk will be incurred if they use it?
- What will be the consequences if they do not adopt it?

Every technology considered for use in communication interventions must be subjected to this type of critical, comprehensive examination. Technical institutions, researchers, extensionists, economists, providers of goods and services, and policymakers will be the principal sources of technological information. However, their perspectives must be considered together with those of the farmers in judging the suitability of a technology for the communication support program.

2. Farmer studies

Knowledge and understanding of the farmers are obtained through various research techniques which collectively are termed developmental investigation. Information is needed about the farmers'

- cultural characteristics and social structure;
- knowledge, attitudes, and receptivity to change;
- the ways in which they receive and use new information;
- vocabulary;
- present practices and levels of adoption; and
- hidden constraints they may encounter in trying a new innovation.

Information is also needed about the variability among farmers and their families in the region.

Approaches and techniques from behavioral analysis, social marketing, anthropology, and the behavioral sciences are used extensively in obtaining and interpreting these types of information. Developmental investigation is essential to designing and testing effective communication strategies and methods at the outset; and continuing reassessment will be needed throughout the communication support program.

3. Infrastructure and policy

As implied in the technology identification and assessment section, final selection of the technologies to be included in the communication support program must also take a number of infrastructural and policy matters into consideration. The practicality of a given technology for farmers depends in part upon their access to credit, inputs, markets, etc. Input:product price relationships most certainly affect economic viability. Government policies concerning these and other production and marketing factors may serve as either incentives or disincentives for adoption, depending upon the policy.

Therefore, assessments of the agricultural infrastructure and policies which will impact upon the adoption of technologies under consideration must also be made during the investigation phase.

Finally, characterization and assessment of the communication infrastructure are needed to determine the most appropriate and cost effective media and channels available to the communication support program. These will be included with the agricultural infrastructure study.

B. Strategy and Materials Design

A communication strategy is a plan for the systematic use of communication concepts, skills, media and methods to introduce new information or ideas to change human behavior. Development of the CTTA communication strategy will involve:

- Determining message content (the technological information to be included)--derived from the technology identification and assessment investigations and considering the farmers' perspectives.
- Defining the strategy's behavioral framework, based on knowledge of farmer characteristics gained through the developmental investigations.
- Defining and segmenting the farmer audience, taking into account variability among the farmers and rural families.
- Selecting media and channels for delivering information to farmers, including their integration into a multi-media delivery system to achieve maximum mutual reinforcement.

- Developing a system for coordinated message content development, pretesting of media materials, timely production and delivery of materials in each medium, formative evaluation, and feedback. Characteristics of media available to the project, their acceptability to farmers, and costs are all considered in developing this system.
- Developing and pretesting prototypical media materials before entering the production phase.

Concepts from extension, development communications, social marketing, and instructional design will be used extensively in strategy development, as well as experience from other communication projects in agriculture, health and education.

C. Testing the Strategy Concept and Prototypical Materials

The strategy and preliminary materials produced to this point are based on the communication staff's interpretation of information gained through the various investigations. The strategy concept, content, and behavioral framework now require field testing to ascertain their effectiveness in transferring information to the identified audience, level of acceptance, and operational feasibility. The same is true of prototypical materials designed for delivery through the various media after communication interventions begin.

Concepts and methods from social marketing and behavioral sciences are integrated with those of agricultural extension and communication in this testing phase.

Participation of communication staff in the investigation, design and testing phases provides opportunity for training in the communication process that will be invaluable as the communication support program develops. Areas of specific need for in-depth staff training are also identified during this period.

D. Media Materials Production

The communication support program is ready to move into operation when the strategy testing phase has been completed, modifications based on test results have been made, and staff have been trained. Key elements in the production of media materials which serve the needs of the program and its audience will be:

- preparing and adhering to production schedules;

- accuracy and relevance of message content;
- quality control;
- close coordination and interaction among those responsible for message development, materials planning and production, formative evaluation, and feedback;
- systematic pretesting of representative media materials;
- prompt response and corrective action for which need is revealed by formative evaluation and feedback, or other ongoing monitoring mechanisms.

Although primarily the domain of communication staff, timely production of technologically accurate, relevant, farmer-oriented media materials requires continual interaction with those involved in other parts of the technology development and transfer system.

E. Information Delivery

The multi-media strategy includes delivery of information to farmers through:

- interpersonal communication with farmers by extension workers, input suppliers field agents, farmer organization representatives, local volunteers or paraprofessionals, researchers, etc.;
- mass media such as radio, rural newspapers and, if appropriate, television and comic books;
- other channels such as print materials, posters, flipcharts, handouts, demonstrations, and audio and visual presentations.

The communication skills of interpersonal communicators, their understanding of how their efforts are being reinforced through other media and channels, and their knowledge and understanding of the information to be delivered are critical to the success of the multi-media strategy. Training and continuing reinforcement of this group are therefore given high priority in the CTTA strategy.

The private sector represents a potentially powerful channel for information delivery as well as an important information source. CTTA will direct major attention to involving the private sector in the communication support program.

F. Audience

The ultimate success or failure of CTTA will depend upon the extent to which farmers increase their rate of beneficial adoption of new or underutilized agricultural technologies as the result of effective communication support to extension programs.

The program's audience of farmers and rural families has been characterized during the investigation, strategy development, and testing phases; and variability within the audience has been studied to permit the program to target messages to each segment. A media production system has been developed, staff have been trained, and materials have been pretested and produced. The audience is now receiving information through multiple media and channels as planned in the strategy.

At this point, formative evaluation, feedback and other monitoring mechanisms become critically important.

G. Formative Evaluation

In CTTA, formative evaluation is defined as studies carried out as part of project implementation to determine if the messages disseminated to farmers have been timely and well-received, and whether the various elements are functioning as planned. Formative evaluation studies are also designed to assess factors such as the attitudes of farmers about the usefulness and practicability of the technologies included in the messages, whether the information has been understood (or, if not, why not), and the extent to which farm women react to and have been helped by the communication program.

Methods and techniques used in developmental investigation will also be used extensively in formative evaluation studies, and formative evaluation results will be correlated with those from developmental investigation.

H. Ongoing Monitoring

The process described to this point is iterative--it must be--with each phase building upon or feeding into all others. The program must also have the capacity and flexibility to respond promptly and appropriately to unanticipated situations. In one sense, the ongoing monitoring function represents a subsystem

designed specifically for this purpose.

Reliable information about local conditions and problems (e.g., an insect buildup, drought, or scarcity of a needed input), collected regularly and fed directly back to the materials production unit, permits the program to respond promptly and appropriately with special programming or modification of already planned programs. Sources of information include the farmer feedback mechanisms, formative evaluation, observations of field workers, and every information source used in other phases of the communication process.

Networking among research, extension, input suppliers, farmers, policymakers, and the private sector is critically important both for identifying situations that require communication program action and for referring non-communication problems to those who can resolve them.

I. Summative Evaluation

An intensive evaluation of CTTA will be conducted in Honduras, the primary site, and case study evaluations will be made in other collaborating countries. Although the summative evaluations will be carried out independently of project implementation, close interaction between implementation and evaluation staff will be maintained, particularly with respect to developmental investigation and formative evaluation.

Chapter V

AGRICULTURAL TECHNOLOGY IDENTIFICATION AND ASSESSMENT

The CTTA Project will not generate new or improved technologies, the first requirement for achieving technology transfer. Therefore, it can have impact only in areas for which such technologies already exist that are underutilized by farmers, and for which new technologies are being generated through sound, problem-oriented research. Selection of pilot sites for which this condition can be satisfied is essential to achievement of CTTA objectives.

A. Critical Agricultural Technology Transfer Issues

Communicators responsible for developing and implementing the CTTA strategies cannot be expected to have expertise in all relevant areas of technical agriculture. Yet, as will become evident, communications play a critical role in selecting the technologies to be included in messages delivered to farmers and rural families. Several issues related to technology development and transfer which are critical to the selection process are discussed briefly below as background for defining the communicator's role.

1. Technology availability

Lack of appropriate, locally adapted technologies has been a serious constraint to agricultural development in the Third World. Too much agricultural research has not been problem-oriented, and results have not been adequately tested on farms to determine local adaptation. Recommendations are typically general, rather than specific to a region or set of conditions, and do not adequately help the farmers to determine what combinations of inputs, practices, and enterprises will be most beneficial to them under their circumstances.

The situation is now changing. The International Agricultural Research Centers (IARCs) and other international and regional research programs have and are continuing to contribute new technologies appropriate for small-farm agriculture in developing countries. Research networks are facilitating the interchange of research information and genetic materials among international,

regional and national research programs.

These programs (as well as other donor-financed projects and some national programs) are increasingly oriented toward farming systems research. The farming systems approach concentrates on identifying agricultural technology problems, needs and potentials in the field; designing and conducting research directed toward solution of those problems; and follow through with on-farm adaptive research trials to determine the appropriateness of new technologies under local farmer conditions. This orientation not only ensures that technologies developed through research are relevant and locally adapted, but also provides effective mechanisms for involvement and collaborative action with extension.

The technology generating/adapting institutions identified thus far are all in the public sector. Two other groups also contribute significantly--the private sector and innovative farmers. For example, private seed companies have active programs for developing improved varieties and private entrepreneurs may invent better tools or machinery needed by farmers in their communities. Innovative farmers often find ways to perform their farming operations more efficiently or modify their cultural practices to save labor, decrease costs, boost production, and/or increase profits.

Although appropriate technologies are becoming more and more available, much remains to be done. National research systems in some countries still require strengthening and reorientation. Research results from international and regional programs do not always reach the national research system or are not tested in the national program to determine their appropriateness for farmers in the country. On-farm research is just starting in some countries. Public sector researchers and extensionists are frequently not in close enough contact with private sector researchers to judge the reliability of their results; nor do they obtain sufficient feedback from farmers to be fully aware of innovations of progressive farmers. Economic and social factors are not given sufficient weight in determining if, or under what conditions, a new technology should be recommended.

In selecting sites for pilot projects, CTTA must assess the status of technology development and adaptation in the country, as well as the stock of potentially appropriate technologies from all of the sources identified above.

In operation, continuing interaction and coordination with all of the sources of technology will be required; and CTTA may help to strengthen the research system through its networking, feedback, and other ongoing monitoring activities.

2. Agricultural infrastructure

Farmers cannot always adopt a new agricultural technology even though they are convinced that it is superior to their present practice in terms of yield potential and profitability. To do so, they must have access to the required inputs (such as seed of an improved variety, insecticide, or vaccine) and needed credit at the time and in the amounts required, and a market at which they can sell their product at a fair price. Lack of farmer access to any of these can place an absolute constraint on adoption, particularly in the case of high input technologies. CTTA does not provide inputs, set prices, or market products. However, the project may contribute to improving agricultural infrastructure capacity to meet these needs by

- including private and public agrosupport sector institutions in the communication network,
- consulting with them on message and communication campaign strategies to determine to what extent such goods and services can be expected, and
- alerting them to potential needs and problems in their areas of activity identified through developmental investigation, formative evaluation, and feedback from the field.

The support of private and public agrosupport sector institutions is also enlisted to assist in the dissemination of technological information to farmers through their field staffs and other established channels.

3. Prices and policies

Price stability and levels that give farmers confidence they can realize a reasonable profit from adopting a new technology are essential to technology transfer program success. Although pricing structures and policies are completely beyond the purview of CTTA, such policies may well be influenced through keeping policy- and decisionmakers fully aware of information gained through development investigation, formative evaluation, and feedback.

4. The technology development and transfer system

The technology development and transfer process is a continuum which encompasses technology generation, testing, adaptation,

diffusion, and adoption. Conventionally, technology generation is associated with research and diffusion is associated with extension (private sector organizations may be involved in either or both).

The testing and adaptation required to assess local adaptability and practicality, technical and economic feasibility, and social acceptance of new technologies constitute a blend of research and extension in which both should be integrally involved with the farmer. Both research and extension should be involved in identification of problems requiring research.

During the diffusion stage, primarily the responsibility of extension, research involvement is needed in formulating technical content of information disseminated to farmers, in technical backstopping of field extension workers, and in resolving problems encountered by farmers in adopting the new technologies.

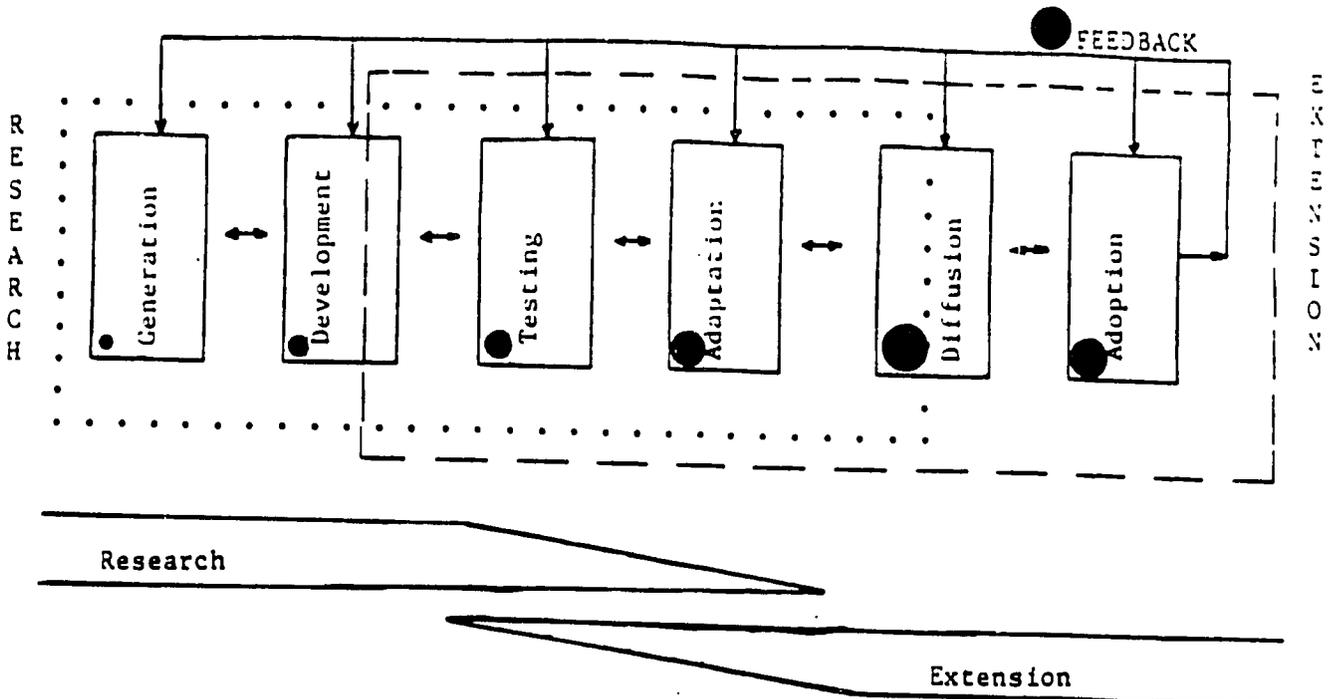
Effective communication between and among research, extension, and the farmers (and the agrosupport sector) is critically important at every stage in the technology development and transfer process. The basic communication functions are to facilitate the multidirectional flow of information among all involved and to minimize the likelihood of information breakdowns at any step in the process. The technology development and transfer process, including principal communication intervention points, is illustrated in Figure V.1.

CTTA can help to strengthen linkages and active collaboration between research and extension by involving researchers as described above, integrating the research system into a communication network that facilitates multidirectional information flow throughout the technology development and transfer system, and collaborating with research in other areas of mutual need and interest.

5. Farmer variability

Variability among farmers and rural families within a region is discussed in greater detail elsewhere in the manual (Section III A2). It is included here in the context of a critical technology transfer issue.

Small farmers in the CTTA pilot project countries can be generally characterized as having severe resource constraints, being reluctant to assume risk, using minimal cash inputs, and often existing at or near the subsistence level. The number of farmers in an area is usually so great, and many are so isolated, that extension has found it difficult to reach the majority through conventional extension methods.



● Signifies communication subsystem intervention; size of dot indicates relative magnitude of input and involvement.

Figure V.1. Agricultural technology development and transfer process.

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Such generalizations are dangerous if used as the sole basis for determining the appropriateness of potentially superior technologies to be included in communication interventions. Within a local setting, great variability among farmers and rural families is nearly always encountered with respect to

- socioeconomic and cultural characteristics,
- perceptions of risk,
- resource limitations,
- attitudes toward change,
- management and husbandry skills,
- modernization of their agricultural enterprises,
- readiness to accept new ideas and products,
- sources of information they believe to be credible,
- quality of the lands they farm, and
- tenurial status.

Small farmers, although they have limited land and other resources, are almost always engaged in several activities that together make up their total farm enterprise. For example, they may plant several different crops both to make best use of the types of land on their small farm and to minimize the risk of not producing enough to meet their family consumption needs. In addition, they probably have at least a few animals (large or small), as well as some fruit trees and, perhaps, a family garden. In many families, some members work off their farm--thus limiting the family labor available for the farming enterprise.

Such diversity must be taken into consideration in developing and conducting problem-oriented research programs, as well as in designing communication interventions that will be advantageous and acceptable to farmers. The farming systems approach discussed earlier addresses this issue.

CTTA's developmental investigations will reveal the nature and extent of such variation and identify those characteristics of greatest consequence for communication interventions. Close coordination and information exchange with agricultural researchers can have significant impact on research planning and directions, and facilitate the selection of technologies most appropriate for dissemination to the various segments of the farming population.

B. Selection of Technologies to Use in CTTA Communication Interventions

Selection of technologies to use in CTTA communication interventions is a complex process involving interaction with a range of institutions and people, as may be deduced from the foregoing discussion. The first step, started during the site selection

discussion. The first step, started during the site selection process, is to identify potentially appropriate technologies and arrange them into three broad categories:

1) Technologies ready for use.

Those which are scientifically sound and adapted to the region and farmers' conditions; have the potential to boost production, increase income, reduce risk to the farmers, and/or benefit them in other ways (save labor, as an example); are practical from the farmers' perspective, considering their resource and other limitations; for which the agricultural infrastructure is adequate to provide farmers the necessary inputs, credit, access to markets, etc.; and for which government policies provide an incentive for farmers to adopt them.

Final selection of technologies to use in CTTA communication interventions must be selected from this group. Both high and low input technologies are required to meet the needs and possibilities of all farmers in a region.

2) Technologies nearly ready for use.

Those which are ready from the research perspective, but for which modest infrastructural or policy constraints must be removed to make them viable.

Technologies in this group cannot be used in communication interventions until the needed changes are made. Although outside its purview, CTTA may be instrumental in removing such constraints by identifying them through its investigation and feedback mechanisms, and bringing them to the attention of the relevant policy and decision makers.

3) Technologies for which major infrastructural or policy changes will be required to make them viable.

In most cases, it is unrealistic to expect that technologies in this category can be used in communication interventions in the near future. Action must come from some other agency--governmental or external--which may well require significant resources and time.

The search for technologies in all of the above categories may well extend beyond the borders of the region or country concerned. In Africa, for example, a team of CTTA-provided experts will visit several countries, IARCs and regional research programs for this purpose. (Private sector research will also be considered.) The technologies identified through that process will then be examined in greater depth in potential CTTA pilot site countries. These steps will be part of the CTTA site selection process and will precede the final selection of technologies to be used in the countries selected.

Final selection of the specific technologies to be used in communication interventions in a given pilot project involves:

- More detailed analysis with researchers and extensionists of available technologies to answer five key questions about each technology identified (from the perspective of research and extension):

Is the technology scientifically sound for the pilot region? Has it been tested on farms in the region and to what extent?

Is the technology economically viable? Will its adoption by farmers increase their profits or reduce their risks?

Is the technology practical? Is it feasible for farmers to use the technology, considering their limitations of resources, power, equipment, labor, access to inputs and markets, management and husbandry skills, etc.?

Is the technology dependable? Will adoption of the technology by farmers subject them to additional risk which they can ill afford?

Are there possible adverse consequences that the farmers may suffer if they use the technology?

- Target audience analysis, developmental investigation, and product/concept testing (discussed in Chapters VIII and IX) to determine farmer reactions and potential receptivity to the technology (the farmers' perspective).

Technologies that are highly appropriate from the research and extension perspective may still be rejected by farmers for reasons such as those discussed in Section III-A-2. It is important to learn, also, whether the technology responds to a need already recognized by farmers or represents an as yet unrecognized opportunity for gain.

- Surveys of public and private sector agrosupport institutions to determine if the inputs, credit, marketing and other goods and services needed to enable farmers to adopt the technology are or can be made available to them in adequate and timely fashion (the infrastructural perspective).
- Assessment of policies--such as pricing structures for inputs and products that will impact on the likelihood of farmer adoption of the technology--and interaction with policymakers (the policy perspective).

Determining which technologies to include in communication interventions is a continuing process. As additional technologies are developed, they must be subjected to the same rigorous interdisciplinary evaluation.

Once a new or underutilized technology reaches the adoption and sustained use stage, ongoing support/revision by research, extension and the agrosupport sector is necessary to assure that the technology continues to be viable and used beneficially by farmers.

It is suggested that an ongoing agricultural technology advisory group be established to guide CTTA in the selection of technologies to be disseminated to farmers, and to assist in the interpretation of results obtained. Representatives from research, extension, communication, behavioral science, social marketing, the agrosupport sector, and policymakers are appropriate to include in this group.

Technical Content of CTTA Communication Interventions

(To be inserted in CTTA Project Manual after p. V-7)

The first stage in the CTTA communication process--investigation and assessment of technologies and developmental investigation--is crucial to establishing realistic and relevant message priorities. Formative evaluation, feedback and monitoring are essential to continuing reassessment and adjustment of message priorities and content. In the summative evaluation, it will be impossible to measure the impact of every message set included in the communication interventions. Therefore, summative evaluation must focus on a few high priority technologies for which clear behavioral change objectives have been articulated.

Establishing realistic message priorities for communication interventions to support agricultural technology transfer involves making compromises among several basic factors:

Seldom can a specific technology or practice stand alone

A new crop variety can result in increased production only if seed is available, and good crop husbandry is practiced throughout the season. Good pest control can do no more than protect the yield made possible by other production factors--variety, fertilization, weed control, etc. Proper fertilization can lead to increased production only if fertilizer is available to the farmer and plant population is adequate, the crop is protected against pest damage, etc.

Even the most spectacular technology can fail, if other cultural practices are deficient. For example, to obtain a good stand with the dwarf wheats when they were introduced into India, the seed had to be planted at a more shallow depth than the native wheats to which the farmers were accustomed.

Thus, ultimate yield is determined by the cumulative effect of a series of technologies and farmer actions throughout the agricultural cycle, all of which must be considered while establishing message priorities.

Economics and infrastructure cannot be ignored

Sustained adoption of improved agricultural technologies is dependent in part on factors other than the biological or physical worth of the technology. Examples of such factors include price

incentives and access to credit, inputs and markets.

Thus, non-technological factors must also be considered in establishing message priorities.

Some key elements are unpredictable

Droughts, floods, unexpected price increases or scarcity of insecticides, heavy rains during harvest when the weather is usually dry, or other factors completely beyond the control of the farmer can be disastrous. Prompt and appropriate action--by the farmer and/or others--may help minimize losses.

Such factors obviously cannot be programmed into message priorities. Flexibility must be maintained, however, to modify them on a moment's notice to respond to unpredictable events.

Farmers' resources, constraints and situations vary

The technical guides should contain the best series of improved technologies and practices available--drawn from research, extension, farmer experience, etc. However, situations change and message priorities must be modified accordingly.

For example, in 1974 in Guatemala, fertilizer prices nearly trebled and supplies became very scarce just as the cropping season was about to begin. From an economic standpoint, fertilizer application on beans and corn changed almost overnight from a high to a minimal return situation. The message strategy had to be changed accordingly. The priority was shifted from encouraging the proper use of fertilizers to focus on other practices needed to protect the farmer's investment in fertilizer if he decided to use it. Another example might be the change in cropping systems and practices when irrigation water becomes available.

Equally important, no two farmers have exactly the same set of possibilities for and constraints to adoption of improved technologies and practices. The "best" set of practices and technologies for an individual farmer likely will not be exactly those recommended in the technical guides, nor will they be exactly the same every year. Even the smallest farmer has some alternatives, limited though they may be, that he must consider in deciding how he will manage his agricultural enterprise.

The need of farmers to select among alternatives available to them must be considered in determining message priorities.

Communication program capacity is not unlimited

It is obvious that the communication program cannot expect to have either the capacity or resources to include all of the above.

Not all message needs can be awarded equal priority. Hard choices must be made--what is done must be done well.

As indicated at the outset, compromises are required to establish message priorities that result in a realistic communication strategy that is manageable, yet addresses the most important needs of the farmers.

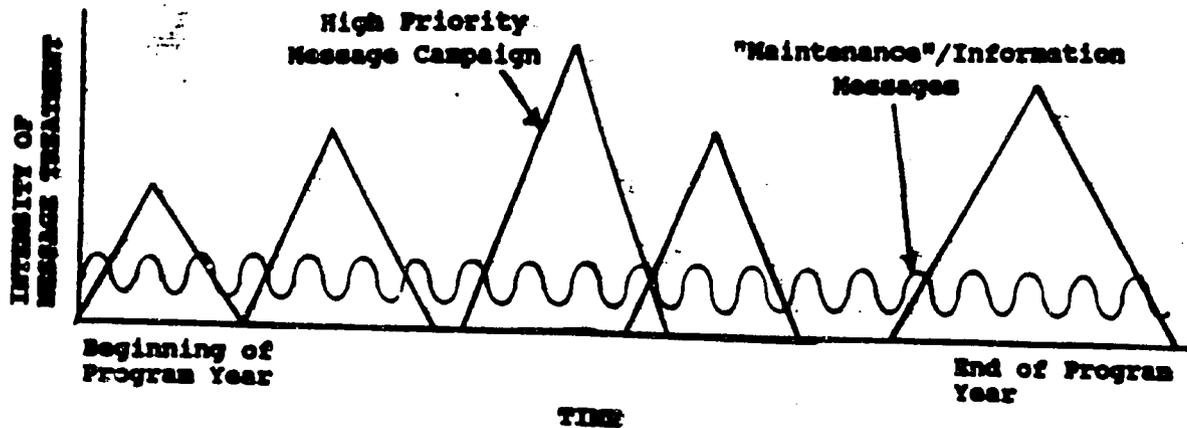
Use the following guidelines for establishing message priorities:

- Assess the need for behavioral change. Some practices may already be used by most farmers, and some are less critical than others in contributing to yield and profit. In such cases, "maintenance" communication interventions may be sufficient--as reminders and to stimulate farmers to do them correctly.
- Determine the time required to convey the message. In some cases, e.g., market or weather news, the farmers' need may be primarily for up to date information. The objective in such instances will be to provide information rather than change behavior, and can be included in the interventions with relatively little communication staff effort and time.
- Concentrate on a limited number of key technologies. Place highest priority on technologies for which behavioral change objectives can be clearly articulated and significant behavioral change appears feasible. These are the ones for which maximum effort and program time will be necessary. Consequently, their number must be consistent with the capacity of the communication program to handle each well--perhaps four or five in a given year. Each will require a campaign approach.
- Include technologies with both short and long range behavioral change objectives. Be realistic in estimating the time required for significant behavioral change to occur. For example, integrated pest management is a long term process, while a specific pest control measure can often be adopted almost immediately.

A balanced message strategy should include both types of technologies. Short term change objectives are needed to maintain the farmers' interest and project support, and for summative evaluation. However, although the project is of short duration, the technology transfer program is not. Therefore, longer range change objectives such as integrated pest management or soil and water conservation improvement are also needed.

Conceptually, the total message content in a year's communication

strategy can be considered to be the sum of two sets of curves as illustrated below.



The flat curve represents what might be termed "maintenance" and informational communication interventions. These are ongoing, and include some treatment of virtually all factors that may affect the farmer's production and/or income; but they are not necessarily related to specific behavioral change objectives and/or are disseminated for informational purposes only.

The peaked curves represent those technologies of highest priority for which behavioral change objectives have been established, and which will receive an intensive communication treatment.

Such a program recognizes two realities:

- 1) Achievement of behavioral change objectives usually requires intensive communication treatment; but the project's communication capacity limitations will not permit all technologies to be treated with equal intensity.
- 2) Many technologies and practices need to be included in a year of programming to provide continuity and "maintenance"; but not all are of equal importance, and not all require an intensive communication campaign treatment.

It is critically important that the technologies represented by the peaks be identified as far in advance as possible to permit time for field verification; to inform the summative evaluation team; and to provide time to develop channel strategies, train staff, and produce materials.

(Refer to Part Two, Chapter V, of "Incorporating Communication Strategies into Agricultural Development Programs" for additional information on determining message content for targeted change, behavioral objectives, and developing channel strategies.)

Chapter VI

TARGET AUDIENCE ANALYSIS AND DEVELOPMENTAL INVESTIGATION

A. Research Areas

The work to be done at this stage focuses on three large, general and interrelated objectives:

- Come to know the audience to which our communications program will be directed, in order to assess its situation, its characteristics, and its points of view in planning this program.
- Come to know how the new technology and the procedures necessary for its application apply to the farmer's present reality, in order to seek the means necessary to integrate the technology and procedures with this situation.
- Determine the most appropriate communications methodology (sources, channels, means, message, materials, etc.) to bring the new technology and procedures necessary to put it into practice to the audience, as well as determine their manner of presentation so that they will be accepted.

As can be seen, the first objective refers to the audience, the second to the product and the third to the most appropriate methodology to link the audience with the product. The three aspects are tightly interrelated and are interdependent. Our product will conform to the characteristics of the audience and the communications program methodology will depend as much on the characteristics of this audience as on the product. For this reason our study should be carried out in this order.

Each of the above objectives implies the use of different research techniques appropriate to its nature. Valuable research techniques may be taken from disciplines such as anthropology, behavioral sciences, social psychology, and social marketing.

1. Analysis of the audience

Before even thinking of beginning field research work with the population it is necessary to gather all existing information about the people and their environs, as well as do a documentary analysis of this information that will allow the formation of certain prior hypotheses. The information collected should include statistical aspects, demographics, economics, ethnography, social, cultural, ecological and geographical aspects, etc. A short on-site observation trip may be an important resource to complement this documentary research and formulate certain lines of work that will govern the research. What may seem a costly time investment may in reality concentrate the focus of subsequent research and avoid future waste of effort by determining research paths to follow.

At this point it is also very important to become acquainted with the development activities that are being carried on in the region, and their relation to the farmers. These may include road infrastructures, public institutions, banks, agro-industrial firms, etc. etc.

Given the nature of agricultural work, and because technology transfer in this field impinges on economic aspects, on attitudes, on the willingness to change and the acceptance of risk that this implies, the research for the analysis of our target audience should include a study of:

- The social and economic structure of the community and social division of labor. Social roles.
- Patterns of economic, social and cultural activity as they relate to specific agricultural technologies.
- Social scale of values and their stability (expectations of reward and punishment for their transgression).
- What is audience presently doing?
- Individual and group self-concept. Level of interrelation of the group in general and of the subgroups (family, religious, economic, etc.) in particular.
- Attitudes toward change and expectations for social and individual progress.
- Patterns, levels and flow of authority.

Given that the technology to be transferred, as well as many of

the channels that will be used in its transfer will be of an official nature (such as the field workers), it will also be necessary to research the level of acceptance and credibility the institutions have within the group.

In this part of the research it is also important to gather the general vocabulary of the people as well as compile aspects of culture and folklore such as oral traditions, etc. related to agriculture. This will be very useful in the design state of the messages, in order to select appropriate formats and tones for their presentation.

All of the above provides a vision of the parameters within which the program will be implemented. A detailed analysis of the information concerning these points can furnish important keys to breaking down the barriers which any social group erects in the face of new ideas and procedures that require decisions that may be decisive in the life of its members.

2. Analysis of the audience with relation to the product

The application of new agricultural technology chosen for a particular region will require a series of conditions which the farmer may provide by acting within present conditions in order to profit from them in this application. Or the farmer may modify these conditions through his intervention. This intervention could require a series of factors which should be researched, such as:

- Present conditions related to the application of the new technology, which may be taken advantage of or should be modified.
- Availability to the farmer of supplies (time, credit, seed, insurance, etc.), material, and tools for the application of the new technology.
- Processes and procedures to follow to apply the technology, and its feasibility within the economic and social parameters of the audience.
- Skills and abilities to put into practice the procedures that must be followed, and the capacity of the audience for this.
- Knowledge necessary to change the conditions which require modification, and to apply the new technologies.
- Real possibilities that the farmer can count on the

conditions necessary for the application of the new technology.

- Possibility that there may be factors or conditions that may reinforce the actions suggested, or possible negative results that may be foreseen or controlled.

These are aspects that the research should take into account in evaluating the present situation of the conditions necessary for the application of the new methodology, and the ways in which these ought to be modified along these lines.

Other aspects to analyze in the field at this stage would be: the impact the new technology would have on agricultural work; the positive as well as the possible negative consequences its application might have on some of the social or cultural qualities of the people; the benefits the farmer could expect from the adoption of the new technology and the most important barriers that could arise in its application.

Once the conditions necessary for the application of the technology have been analyzed, the implementation of the technology in the field would be analyzed. For this it is necessary to observe it in operation in order to determine, beyond everything mentioned above, the following aspects, among others:

- Complexity of the actions necessary to put the technology into practice.
- Persistence needed in these actions in order to arrive at the proper way of doing things.
- Observability, in action, of the results of the action components of the suggested procedure.
- Differences there may be between the suggested procedures and the present procedures of the farmers.
- The cost the farmer would have to pay (in terms of time, money, risk, etc.) to give up his present procedure, and the acceptability to him of the suggestions in relation to the benefits he might realize.

With the results of the two points above in regard to the analysis of the target audience, the various "subgroups" within the audience can be distinguished, and the messages to be prepared focused in accordance with their particular characteristics.

In the case of agricultural activity, the segmentation of the audiences may be very complex, since the different conditions and

characteristics of each farmer make generalizations even within one region very difficult.

The results of the research will reveal, for example, that there are different levels of acceptance and motivation for change. Marketing specialists often divide the population with relation to something new as: informed, uninformed, experts, interested, ready to experiment, possible former users. In any case, each program, in accordance with its objectives and its product, may segment its audience in the manner best suited to it.

In general we can say that our primary audience is the farmers (separated into different subgroups in accordance with parameters set beforehand), and secondary audiences would be institutional personnel, providers of agricultural supplies, and other groups related in one way or another with agricultural work, and who are believed appropriate participants in the communications network.

3. Communications analysis with relation to the audience and the product

There is a series of data that the research should capture in order to formulate the communications strategy. Some deal with the population, as for example:

- Information flow and the communication within the group. Sources, channels, communications media within the community.
- Information sources outside the community. Access and exposure to the communications media. Exposure times.
- Literacy levels.
- Contacts with the outside. Places and frequencies.
- Community organizations.
- Public and private organizations. Agro-industries.
- Audio and visual behavior of the target population. Preferences in regard to communications formats.

Others deal with the product and seek the keys to what the market calls the "selling point":

- Benefits of the product which may be emphasized.
- Devices which help the farmer relate these benefits to the new technology.

- Ways of persuasively describing the costs and benefits of the new technology to the farmer.

The communications strategy should really be the fruit of a deep analysis of the results of each and every one of the research aspects in order to be able to respond to the five major key questions:

- Who are we addressing?: a clear definition of the individual and social personality of our listeners. This information is explained in the first point.
- What should be said?: this refers to what should be communicated so that the target population adopts the hoped for knowledge and procedures.
- When should it be said?: this refers to the careful planning of the broadcast time of the messages, in accordance with the application cycle of the technology.
- How should it be said?: this refers to the tone and formats of our communication in order to motivate the farmers and break down barriers to innovation.
- Through which channels?: that is, which media will serve best to effectively reach each segment of the population with the corresponding message best suited to its expectations.

Finally, it is also necessary to do field research on the means of distribution of the program's communication materials and, very importantly, the possible channels through which feedback may be attained. Although in most cases this feedback should be directed or carried out throughout the various methodological stages of the project, it is important to research the possibility of spontaneous means of feedback from the audience itself through its organizations or in any way it may be gathered at this stage and later tested. These spontaneous means have the advantage of being more true and objective because they do not involve intermediaries in the return communication. Very often private agricultural development firms and organizations are excellent channels for distributing materials and collecting feedback. Therefore their role in these two matters should be well researched.

B. Research Methodologies

Each field of research has techniques appropriate to its own nature.

In addition to the review of the documentation, prior to planning the research itself, individual surveys and interviews in key places could be the most useful techniques to gather the socio-economic information necessary during the first stage. The focus groups could provide important information about the interaction of attitudes, motivations of social behavior, the group's expectations for progress, as well as cultural aspects. Structured observation could be a useful research tool to determine the patterns, levels and lines of authority and communication, and this observation might be reinforced with confirmation of the results through individual interviews.

With the results of all the techniques applied duly transcribed, the general vocabulary of the population may be compiled. To this end the focus group sessions may also be taped.

A combination of individual interviews with participating or non-participating observation would be an appropriate method to gather information regarding the application of the new technology which will be transferred. Trial runs of the application of the new technology would serve as a reference for researchers to analyze the complexity of the procedure that the target audience should be taught.

A comparison of the results of these observations, with the observation of the audience's present procedures will illustrate the differences between them which must be covered by the communications program.

The surveys, focus groups with representative segments of the audience and interviews with officials of the local communication media will be useful for an analysis of the access and exposure of the group to different information sources and the level of preference and credibility attached to each.

None of the research techniques outlined above can on its own contribute significantly to the gathering of realistic and objective information. The most useful method is to plan an interrelated, complementary, and reinforcing utilization of the various techniques. The choice of techniques in each case will depend on the nature of each objective of the research in particular, and on the characteristics of each segment of the target audience researched.

Although this research may seem extensive and complex, given the data and quantity of information required, in reality its implementation should be designed in such a way that the techniques are used and interact with each other in a quick and dynamic manner.

Chapter VII

PLANNING AND STRATEGY DEVELOPMENT

Investigational phases of the CTTA communication process--agricultural technology identification and assessment, and target audience analysis and developmental investigation--have been discussed in Chapters V and VI. The results of these investigations provide the information and insights needed to move on to the next stage, planning and strategy development.

It may appear from the order of presentation in the manual that these stages are sequential. However, this is the case only initially when the project is getting started. In operation, as emphasized in Chapter IV, the CTTA communication process is iterative and interactive, with each stage continually feeding into and drawing from every other stage.

A. Behavioral Framework

A clearly defined behavioral framework based on knowledge of farmer characteristics is essential to development of a viable communication strategy. The framework identifies and organizes the "intended behaviors"--including changes in knowledge, attitudes and practices--of target farmers if they are to adopt and use a given technology beneficially. It is based on behavioral analysis, developed from information gained through the developmental investigations, refined through concept testing, and continually updated throughout the project.

[TO BE EXPANDED]

B. Behavioral Objectives

Simply stated, CTTA behavioral objectives are descriptions of what the farmer will think, understand, or be able to do concerning technologies included in the communication program, provided it is successful. Determination of the clear, measurable behavioral objectives which will be used to guide all communication activities is based on behavioral analysis that includes:

- identification of the behavioral parameters relevant to a technology, based on developmental investigations and existing data which identify farmers' current behaviors and their environmental context;
 - development of a sequence of measurable steps necessary for achieving the desired change in farmers' behavior-- e.g., successful adoption and continued use of an improved technology;
 - measurement of each behavior against criteria which emphasize its consequences, performance costs, compatibility with existing behavior patterns, and observability.
- Behavioral objectives should be stated in terms of the level of anticipated program participation and changes in farmers' knowledge, attitude and behavior. They need to be quantified so that they can be translated into action, and set in order of priority. Not all objectives are equally important, and communication interventions on some must precede those related to others. Personnel and other resource limitations must also be considered in development of communication program objectives to ensure that they are realistic and achievable.

Behavioral objectives are needed at two levels: 1) those established for the project; and, derived from the first, 2) specific behavioral objectives related to each message sequence (technology or technology set) to be used in the communication program. For example, specific behavioral objectives for a given technology might include:

- The farmer is aware of the technology.
- The farmer learns more about and understands the technology and its relationship to what he is presently doing.
- The farmer is motivated to try the technology.
- The farmer knows how to use the technology.
- The farmer knows where and how he can obtain needed inputs, services and access to markets if he adopts the technology.
- The farmer is using the new technology correctly and beneficially.

Depending upon the nature and complexity of the technology, the number of specific behavioral objectives may be greater. The

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important thing is to include in proper sequence all of the measurable steps required to get the farmer to try and adopt the technology.

No farmer is likely to be able to adopt all of the technologies recommended in the CTTA communication program. He must think and act in terms of what combination of technologies are best for his total farming enterprise under his situation, and must make choices among the various technologies that he is already using and improved ones that he learns about through the program. Therefore, the CTTA farmer-oriented communication strategy must move beyond persuasion, instruction, and reinforcement related to a specific technology to a set of educational objectives directed toward helping the farmer improve his ability to make appropriate choices among technological options.

C. Audience Segmentation

As pointed out in Ch. III, Sec. A2, farmers are not all alike. The CTTA target audience is comprised of individuals or groups of differing circumstances with respect to their resources, levels of knowledge, management skills, ability and willingness to incur risk, land tenure arrangements, access to inputs/credit/markets, receptivity to change, the role of the men and women (and sometimes youth) in making family decisions, etc.

CTTA communication strategies are based on understanding the farmers and rural families, including the differences among them, and will orient the communication program toward their perspectives. This requires that all substantive segments of the program's target audience be clearly defined and characterized. In some cases, the same message may be appropriate for the general audience, but its presentation may need to be segment-specific. In other cases (bean slug control, for example), the message will be relevant to only certain segments of the audience.

Diversity within what may appear to be a single audience segment must also be taken into account. An illustration from Guatemala will serve to illustrate this point. A small study was conducted to determine fertilizer and insecticide use on maize, and resulting yields obtained by four small farmers from one community in southeastern Guatemala who had planted 0.7 to 1.4 hectares of maize. The results are shown below.

Farmer	Fertilizer used		Insecticide used	Maize yield kg/ha
	At planting kg/ha	At flowering kg/ha		
A	1.3	1.3	yes	2275
B	5.8	5.8	yes	1425
C	0.0	0.0	no	1300
D	1.6	1.3	no	475

One farmer used no fertilizer, one used too much, and the others were intermediate. Two used insecticides and two did not. The highest yield was nearly five times that of the lowest. Two important points can be made. First, maize yields were obviously affected by factors other than those measured--although farmer D used the correct amount of fertilizer, his yield was much less than that of farmer C who used no fertilizer. Second, the farmers varied in their behavior related to fertilizer and insecticide use.

The information and insights required to identify and characterize audience segments will come from target audience analysis and developmental investigations. It is critical that these investigations be designed to provide the information needed for this purpose.

Although farmers in the pilot region will constitute CTTA's primary audience, the project will also have a group of secondary audiences--public and private sector institutions and organizations of the types identified in Chapter XIV. These audiences must be identified, their roles in achievement of project objectives determined, and specific strategies developed for their involvement.

D. Communication Strategy

The communication strategy is a plan or design for introducing new or improved agricultural practices throughout a population. It is the cornerstone of the entire communication program.

As illustrated in Figure IV.1, the strategy is based on information and understandings gained through the various investigations. It includes objective-based plans for:

- selection of message content--the technological information to be used in communication interventions;
- defining its behavioral framework;

- defining and segmenting the farmer audience, taking into account variability among farmers and rural families;
- developing the educational programming system required to achieve the program's behavioral objectives;
- selecting media and channels for delivering information to farmers, including their integration into a multi-media delivery system to achieve maximum mutual reinforcement;
- developing and pretesting prototypical media materials before entering the final production stage;
- conducting ongoing formative evaluation studies and pretesting;
- collecting and distributing feedback systematically and promptly;
- responding promptly and appropriately to problems and opportunities identified through formative evaluation and feedback.
- developing a viable communication network;
- providing systematic communication-related staff training and support; and
- developing a system for ongoing monitoring and mid-course adjustments and corrections.

The communication support program must be consistent with and integrated into the total agricultural technology transfer program. Extension workers and private sector field staff and local suppliers will be an integral part of the multi-channel information delivery system and key collectors of feedback. Extension specialists will provide the training and backstopping related to technical content of communication interventions. The communication program will interface with other components of the extension program at many points, and much collaborative action will be needed. Therefore, development of an effective strategy requires extensive interaction and joint planning with extension.

The strategy addresses both the plan for providing effective communication, and the staff and facilities available for its implementation. Although the staff and facilities available to the project will probably have been identified much earlier, the manner in which they are to be organized and used should be in the strategy.

WHO	WHAT	WHY	WHEN
FARMER	<p>Knowledge about the technology, its potential benefits to him and how it can be used in his farming enterprise</p>	<p>To make him aware that it exists and convince him to try it</p>	<p>Ideally, the year before you want him to try it, but at least several months in advance</p>
	<p>Instruction in how to use the new technology</p>	<p>To enable him to try it successfully</p>	<p>The complete instructions at least a month in advance, repeating each step just before he will do it</p>
	<p>Where to get help if he has problems, and where he can obtain the inputs he needs</p>	<p>To give him confidence to try it, and enable him to get the required inputs</p>	<p>In the initial "knowledge" message, and timed with "instruction" messages</p>
EXTENSION STAFF IN FIELD	<p>Knowledge about the technology and its potential benefits to the farmer</p>	<p>To enable them to take the information to the farmers, reinforcing what they have heard through other channels and providing more complete information</p>	<p>Before the information program is initiated</p>
	<p>Details about how to use the new technology</p>	<p>Same as above</p>	<p>Before the information program is initiated and periodically throughout the program</p>
	<p>Sources of assistance and inputs that may be needed by the farmers</p>	<p>Same as above</p>	<p>Same as above</p>
COMMUNICATION STAFF	<p>Detailed information about the technology, its potential benefits to the farmer, where and how the farmer can obtain help and inputs, and other information implied above</p>	<p>To develop message presentations in various media to be used that will be accurate and complete information</p>	<p>Before the program is initiated, and at least two months in advance of each of the steps above</p>
	<p>Information and understanding about farmers as discussed in Part TWO, Chapter V</p>	<p>To develop message presentations in the various media that are comprehensible, acceptable and convincing to the farmer</p>	<p>Before the program is initiated and periodically updated throughout its duration</p>
	<p>Feedback from farmers about the comprehensibility, acceptability and reaction from the farmers perspective</p>	<p>To improve the output of the communication subsystem, and add, modify or delete communication media/methodologies as needed to obtain the desired impact</p>	<p>Continually throughout the course of the program</p>

<p>POLICY MAKERS</p> <p>ADMINISTRATORS</p>	<p>Resource requirements, with justification, program objectives, potential program benefits</p> <p>Reports of program progress</p> <p>Problems that require incourse adjustments in the program</p> <p>Revised estimates of resource requirements</p>	<p>To obtain the resources required for the program, and to generate support for it</p> <p>To maintain understanding of and support for the program</p> <p>To gain support for making such adjustments, and informed decisions regarding same</p> <p>To enable administrators to make informed decisions regarding same</p>	<p>During the project design phase</p> <p>Periodically throughout the course of the program</p> <p>As the need arises</p> <p>As the need arises</p>
<p>RESEARCHERS</p>	<p>Feedback from farmers regarding their experience in using the new technology--- successes and problems</p>	<p>To enable the researchers to help the farmers deal with problems encountered, and to continue to improve the new technology</p>	<p>Continually throughout the course of the program</p>
<p>BUSINESS AGRI</p> <p>FIRMS</p>	<p>Knowledge about the new technology and how it should be applied</p> <p>What inputs will be required, and where and when</p>	<p>To enable them to answer farmers questions and gain their support for promoting the new technology</p> <p>To enable them to have the input available to the farmers at the time, in the place, and in the quantities needed</p>	<p>At or before the time the farmers are first informed about the new technology</p> <p>Several months in advance of the need for each given input</p>

Figure VII.1. The WHO, WHAT, WHY, and WHEN of project information needs.

For convenience in preparation and use, and to facilitate comparisons across CTTA sites, it is recommended that the strategy (and the integrated action plan) be organized approximately as follows:

1. Statement of extension objectives.
2. Developmental investigation plan.
3. Behavioral framework.
4. Behavioral objectives toward which communication support is to be directed.
5. Plan and criteria for selection of communication media and methodologies to be used.
6. Plan for testing strategy concept and design and preliminary materials developed.
7. Plan for development of educational programming system.
8. Formative evaluation and pretesting plan.
9. Plan for collection and distribution of feedback and feedforward.
10. Interinstitutional coordination, collaboration and networking plan.
11. Staff training and support plan.
12. Ongoing monitoring plan.
13. Plan for reviewing, replanning, and adjusting program.

These components are discussed in the sections below. Although some steps are accomplished before strategy development can be undertaken, they are included in the strategy to place them in the context of the total communication support program.

1. Extension objectives

Agricultural technology transfer objectives through extension, and their implications for private sector involvement, must be clearly understood at the outset as communication support will be an integral part of the extension program.

2. Developmental investigation

Refer to Chapter VI for guidance.

Although target audience analysis and developmental investigation must precede and will provide the basis for strategy development, they are an integral part of the communication process and will require periodic updating and reassessment as the program progresses.

Determination of who needs what kinds of information, why they need it, and when is essential to strategy development. Much of this will emerge from the technology, farmer, infrastructure, and policy investigations made prior to development of the complete strategy. For ease of use of such information, it is suggested that it be organized into a form such as that illustrated in Figure VII.1.

3. Behavioral framework

Refer to Chapter VII, Section A, for guidance.

4. Behavioral objectives of the communication support program

Refer to Chapter VII, Section B, for guidance.

5. Selection of media and channels

Selection of media and channels for use in the communication support program is governed by two major factors: 1) media, channels, methods, facilities, staff and other resources available to the project, and their relative costs and cost effectiveness; and 2) the media/channel combinations most effective in conveying a particular message or message series.

The communication support program must function within the constraints of media, channels, facilities, and methods available to it. An early step in strategy development is therefore to determine what is or will be available. Estimations of relative costs and cost effectiveness are also needed at this stage. An illustrative inventory of communication resources is shown in Figure VII.2.

TYPE	DESCRIPTION	COMMENTS	POTENTIAL AVAILABILITY TO PROJECT
H U M A N	Field extensionists	96 in region	yes
	Extension supervisors	4 in region	yes
	Extension media production	2 editors 1 artist 1 radio producer Print shop staff	yes yes yes parttime
	PVO's	5 PVO's with total of 23 staff in region	parttime
	Agri-business firms	14 firms with total of 47 staff working full or parttime in region	possibly
	Producer associations	2 with 2 technicians	yes
	Agricultural credit banks Etc.	1 national, 2 private with total of 7 credit agents	parttime
	F A C I L I T I E S	Extension media unit	Radio, print, A/V video
Radio stations		1 national 2 private	yes sell services
Offset printing		3 private firms 1 government printing office	sell services yes
Telephone		To only major towns	yes
Movie theaters Etc.		In all major towns	sell services

Figure VII.2. An illustrative inventory of existing communication resources.

No single media, channel or methodology is best for all audiences and messages, nor powerful enough by itself to achieve communication objectives. Broadcast media such as radio and television are better for reaching a lot of people quickly with relatively simple and straightforward information or ideas. Print media are best for providing complex information or a timely reminder of information that people otherwise cannot be expected to remember. Interpersonal communication channels such as extensionists, group meetings, demonstrations, and community organizations are still the best way to teach and develop credibility.

An illustrative list of communication media/methodologies that may have utility in the project, and some of their characteristics, is presented in Figure VII.3. It will be useful to prepare such a matrix adapted to the possibilities and needs in each pilot project.

The challenge is to orchestrate the various possible inputs to maximize their total impact and minimize costs. Not all channels can be use all the time because costs would be exorbitant. Elements must be selected from each of the media groups and integrated in a manner to obtain a total impact greater than the sum of the individual impacts.

Channel strategy. The communication strategy indicates the media, channels and methodologies to be used in communication interventions. However, a situation-specific channel strategy is also needed for each message series--each technology or technological package. It may be relatively simple or complex, depending upon the technology and the situation.

Channel strategies grow from an understanding of the region, the audience, and the messages to be delivered. They are based on developmental research into such questions as:

- Who listens to what and when?
- Who reads? Who can read? What do they read?
- What are the costs of each media/channel that could be used?
- How complicated is the message?
- How receptive is the target audience to radio? To print? To group meetings? To extension agents?
- Who do the farmers trust? What media?

A channel strategy for mass media will identify the media that will be used and the weight that will be given in terms of budget

MEDIA GROUP	GROUP CHARACTERISTICS	REPRESENTATIVE MEDIA / METHODS
BROADCAST	<p>Many people can be reached quickly</p> <p>Best for relatively simple messages</p> <p>Can be localized and personalized, although radio is usually considered to be an impersonal media</p> <p>Radio can be extremely low cost per contact hour</p> <p>Best when used in combination with interpersonal and/or group contacts</p>	<p>Radio</p> <p>Television</p>
PRINT	<p>Best for providing complex information in a form that can be used for later reference</p> <p>Most forms require literacy, but this problem can be surmounted in part through use of appropriate graphic materials</p>	<p>Bulletins</p> <p>Leaflets</p> <p>Flyers</p> <p>Posters</p> <p>Flipcharts</p> <p>Comic books</p> <p>Photonovals</p>
INTERPERSONAL	<p>Still the best way to teach and develop credibility over time</p> <p>High cost per contact hour and the number of people that can be reached is limited</p> <p>Effectiveness depends in large degree upon the basic communication skills of the change agent--extension agents, paraprofessionals, volunteers, agri-business representatives, etc.</p>	<p>Conversations</p> <p>Demonstrations</p> <p>Telephone</p> <p>Field trials</p>
PEORG COMMUNITY	<p>More people can be reached by each agent</p> <p>Opportunity for group interaction enhances value of contact and possibility of change</p> <p>Less costly per contact hour than one-on-one contacts</p>	<p>Demonstrations</p> <p>Audio cassettes</p> <p>Videotapes</p> <p>Plays and Dramas</p> <p>Puppets</p> <p>Flipcharts</p> <p>Field days</p>

Figure VII.3. An illustrative list of communication media/methodologies that could have utility in the project.

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and effort; the approaches to be taken (e.g., publicity on existing programs, creating special programs, paid versus public service advertising) and the timing of message delivery.

Similarly, it will identify the interpersonal channels (e.g., extension agents, farmer organizations, agrosupport firm field representatives) to be used as well as other interpersonal communication approaches such as point-of-purchase promotion, village demonstrations, field days, displays at fairs and markets. Most importantly, the role and functions of the extension agent in the information dissemination process must be clearly specified.

A structure for development of channel strategies, and the sources of information to be tapped is to be included in the overall communication strategy.

6. Testing strategy concept and design,
and preliminary materials

Refer to Chapter IV, Section C, for guidance.

7. Educational programming system

The CTTA educational programming system must have the capacity for

- ongoing planning and strategy development--operationalizing the strategy, adjusting to changing needs and opportunities as they emerge during the course of the project, and responding to emergency situations;
- development of message content--including liaison with information sources;
- production of high quality educational materials for all media and channels used in the communication support program; and
- delivery of information to the farmers in accordance with the channel strategy for each series of messages.

The system is conceptualized in Figure VII.4, adapted from the Guatemala Basic Village Education Project. It must be tailored to the situation in each collaborating country, taking into account differences in structure, functions, facilities, personnel, and financial resources of institutions through which

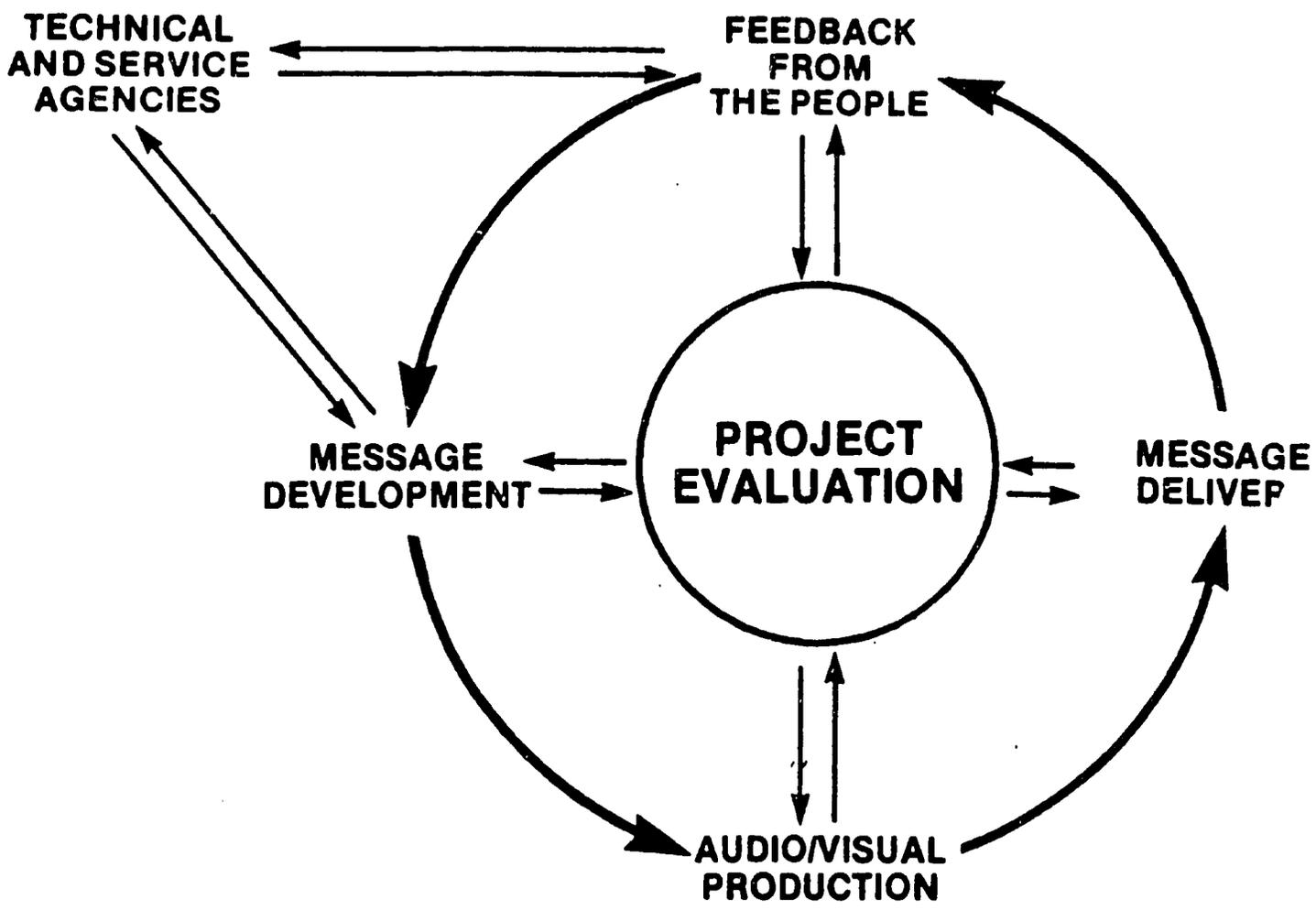


Figure VII,4, The educational programming system concept.

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CTTA will be implemented. To provide some guidance, however, a generalized organizational structure for a communication unit to operate the educational programming system is suggested in Figure VII.5.

a. Message content development. Refer to Chapters V and X for guidance.

b. Production of high quality educational materials. Refer to Chapter X for guidance.

8. Formative evaluation and pretesting

Refer to Chapter XI for guidance.

9. Collecting and distributing feedback and feedforward

In general, a feedback/feedforward system is described as planning implementing, and operating a communication network to facilitate the rapid, regular, and collection of undistorted information from the field and its transmission to those who need to know and act on it. Feedback refers primarily to the flow of information from farmers to the communication program, extension and other relevant institutions. Feedforward refers primarily to information flowing to research from farmers and extensionists.

Feedback is distinguished from feedforward to emphasize the need for research to receive a continuing flow of information from the field related to experience of farmers as they use recommended technologies and practices; reasons why farmers have not adopted technologies; problems constraining agricultural production in the pilot region that require additional research; and unrecognized opportunities and potentials for increasing farmers' production and profits. Although their involvement in on-farm trials provide opportunity for researchers to obtain much of this information directly, they still need a systematic flow of information from the field on a regular, continuing basis.

An array of other supply, service, marketing, and development institutions also require information from the field to help them anticipate needs and develop appropriate programs. In addition to the communication support program at least three major categories of institutions require continuing feedback on which to base action that impacts on CTTA directly or indirectly:

- Extension--to maintain an effective, relevant, farmer-oriented technology diffusion program;

(TO BE COMPLETED)

Figure VII.5. An illustrative organizational structure for a viable communication unit.

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- Policymakers and Ministry-level Administrators and Decisionmakers--to provide the basis for making sound decisions concerning policies and procedures that effectively support the technology diffusion thrust;
- Agrosupport Institutions which provide goods and services to farmers--to enable them to adjust their operations rapidly in response to immediate problems and needs.

The collection and distribution mechanisms used in the CTTA feedback/feedforward system must be tailored to take full advantage of existing facilities and channels. In general terms, system elements and responsibilities related thereto will be approximately as follows:

- The system, including a format for collection of information and explanation of the types of information required, is part of the communication strategy. Communication staff, working in collaboration with users of the information, are responsible.
- Extension is primarily responsible for collection of information in the field and transmitting it to a central point.
- Aggregation and summarization of information received is primarily the responsibility of communication staff, in collaboration with other program specialists as required.
- Distribution of information to those who have need of it is primarily the responsibility of communication staff.
- Frequent checks on the validity and completeness of information received is a joint extension-communication responsibility, with communication staff taking the lead.
- The institution or person concerned has responsibility for taking appropriate action based on information received.

Technical guidance from behavioral and agricultural scientists is to be used in the designing and operating the feedback/feedforward system.

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10. Interinstitutional coordination, collaboration and networking

Refer to Chapter XIV for guidance.

11. Staff training and support

Refer to Chapters XV and XVI for guidance.

12. Ongoing monitoring

Refer to Chapter X, Section D, for guidance.

13. Reviewing, replanning, and adjusting the program

Refer to Chapter XII for guidance.

E. The "Final" Communication Strategy

A communication strategy can never become final. It must have built-in flexibility to permit rapid response to changing circumstances, needs, and opportunities. As institutionalization progresses, there will be changes and growth in staff expertise and capabilities; and staff roles will evolve accordingly. More efficient ways of collecting, processing and disseminating information will be developed. Researchers, extensionists, and others associated directly or indirectly with the project (both public and private sector) will increasingly recognize the role of communication in helping them to achieve their own objectives and improve their own communication skills; and they will call upon communication staff to help them.

In short, the communication strategy developed early in the project is only the first step in a dynamic, iterative process.

Chapter VIII

PRODUCT OR CONCEPT TESTING

[To be revised following Workshop]

Prior to designing and conducting product or concept testing, a communication strategy will have been developed. In review, the Communication Strategy Statement contains a statement of the problem, a statement of the information needs and perceptions of target audiences, campaign objectives, target audiences (primary, secondary, and tertiary), and communication strategies. Based on the planning and development of the communication strategy, message concepts are designed. Message concepts consist of rough art work, such as sketches or line drawings, and brief phrases which represent the primary ideas for a message. Possible lines or slogans which summarize the major theme of the campaign are also included.

A. Product or Concept Development

Multiple concepts or products can be developed for each campaign strategy. Each concept is to be based on the communication strategy selected earlier. If the strategy centers on communicating the effectiveness of a particular technology practice, concepts that stress other benefits or attributes are off strategy.

Consider several issues when developing message concepts:

- What type of message format is to be used?
Some options include a testimonial from a celebrity or a person representative of the target audience, a portrayal of a real life situation or a vignette.
- What type of presenter should be used to convey the message?
Options for presenters are numerous. Possibilities to consider are farmers, cooperative leaders, community leaders, extension workers, or supply providers.
- What is the message's appeal?
Tone of the message can be informative, logical, emotional or humorous.

Multiple approaches can be used and be effective. The selected approach must reflect the communication strategy. If the strategy is to promote compliance with treatment of a pest, message concepts that focus on detection should be discarded because they are off strategy. To determine whether concepts are likely to be effective, these concepts are pretested among individuals typical of the target audience. Chapter IX. Materials Development and Pretesting contains more information regarding various communication message approaches and their effects as well as guidelines for developing effective messages.

B. Pretesting Message Concepts

Pretesting is used to describe the process of systematically gathering target audience reactions to messages before they are produced in final form. This is one type of formative evaluation research which is conducted in early states of program development.

The purpose of pretesting message concepts is to provide direction for eliminating weaker approaches or unintended misleading concepts and to identify message concepts that have the most potential. Occasionally, entirely new message concepts will evolve from audience responses. During the pretesting process, it is useful to collect words, phrases, and vernacular from the target audience so that appropriate language can be used in formulating complete messages.

C. Methods for Pretesting Concepts

The three most common methods for pretesting concepts are:

- focus groups,
- in-depth interviews, and
- central location intercept interviews.

1. Focus group interviews

Generally 8 to 10 respondents representative of the target audience are used to conduct focus group interviews. Each focus group session is conducted by an experienced moderator. The moderator follows a discussion guide or outline to keep the session on track while allowing respondents to talk freely and spontaneously. Moderators probe new topics which may emerge from the discussion.

Moderators should be trained in group interviewing and be well informed of the purpose of conducting the groups. Good moderators build rapport and trust with the respondents. Moderators should probe respondents without influencing their opinions. Moderators need to know how to lead discussions rather than being led by the groups and how to keep the session on track. Sessions are frequently recorded to allow the interviewer to focus on the content and flow of the session and to facilitate later analysis of the interviews and identification of relevant words, phrases, and vernacular.

Typically, respondents are recruited in advance of the interview session. Screening criteria for selecting respondents is based on the variables from the target audience analysis and may include variables such as socioeconomic status, family size, geographic location, access to markets, or marketing infrastructure, type of crops produced, size of land cultivated or owned and sex. Several important considerations must be kept in mind in order to allow for an effective group interview.

- Respondents need to be assured of anonymity.
- Respondents should be given an explanation of how the interview results will be used.
- Respondents should not know the objectives of the sessions in advance.
- Respondents should not know each other. Knowing other respondents may inhibit individuals from talking freely.

Usually, three to four focus groups are considered to be sufficient, however, the number of groups conducted depends on the degree of complexity of the subject and the resources available. A focus group generally lasts about 1 1/2 hours. Sometimes it is desirable to segregate respondents by age, sex, or other variables if the concepts being pretested are sensitive or emotional.

Some difficulties with traditional focus groups of 8-10 respondents include:

- Each participants' speaking time is limited.
- Dominant/submissive relationships emerge.
- Participants become frustrated when not able to express ideas.
- Longer speeches are a tendency.
- Side conversations develop.

As a result, there is a tendency for moving to smaller groups of 6-8 respondents.

Determining the number of focus groups is based on:

- represent each geographic region where there is a meaningful difference.
- two groups for each variable.
- enough groups to rotate the order of the stimulus materials.
- when responses become repetitive or old, stop conducting.

Moderators are responsible for setting the tone, maintaining the structure, and controlling the flow of the session. Focus groups are generally organized into three sections: Introduction/warm-up, the in-depth discussion and closure. Moderators will need to relax respondents and make them feel at ease. The moderator will introduce himself and explain the general purpose. He will explicitly state that varying opinions are encouraged and present the rules of the group. Respondents should each give their name and relevant background information.

In wrapping up the focus group session, summarize the discussion, identify themes which emerged and explore the degree to attitudes held. Identify where consensus occurred and differences in a non-judgmental fashion. Elicit any last comments from respondents.

After the group, debrief with the moderator. Refine the topic guide if necessary. Alter respondent qualifications or cancel or add groups as necessary.

Other items to be taken into consideration when conducting focus groups include appropriate facilities, recording equipment, refreshments, and an incentive to ensure participation.

The ground rules for conducting focus groups include:

- The session is recorded so that the moderator doesn't have to take notes.
- Only one person speaks at a time. This allows all opinions to be recorded.
- Everyone should feel free to speak and present their ideas during the session.
- Respondents should be open and truthful. Don't say what you think the moderator wants to hear, but what is true for you. Speak from your own experience. Remember there are no right or wrong answers.

The moderator's topic guide represents a summary statement of the issues and objectives of the focus groups. It serves as a memory aid for the moderator and provides a list of key topics to be covered during the session. Specific questions for probing are generally included under each topic.

To develop a topic guide, first determine the decisions

and/or actions to be taken from the focus group findings. Agree on the specific objectives and information needs of the research. Determine what background information is needed from respondents to evaluate their comments during the group. Prepare a list of topic areas which begin with general unthreatening items to specific topics of interest. Prepare a list of questions to probe each topic area. (This will be used if the information does not emerge spontaneously. It serves as contingency planning). Prepare probing questions to be used depending on responses and transition approaches when moving into a new area or introducing stimulus materials. Examine stimulus materials used for special areas of concern and questioning. Eliminate non-essential topic areas, quantitative type questions.

There are many guidelines for an effective moderator. A number of useful suggestions are provided below:

- Stimulate respondents to talk to each other.
- Know when to probe and when to listen.
- Probe without leading the respondents.
- Be able to convey a lack of complete understanding of what a respondent says without appearing phony.
- Pay close attention to what is said to foster the same behavior of other group members.
- Be sensitive to nonverbal cues of respondents to better understand and facilitate respondents' true feelings
- Do not assume that what a respondent says is what is really meant.
- A consensus is not necessary. Encourage honest disagreement between respondents.
- Encourage quiet group members to participate.
- Discourage dominant or disruptive group members.
- Be permissive but keep the group on track.
- Expect the unexpected and know how to react.

2. Individual in-depth interviews

In some cases, focus group interviews are not as useful as individual in-depth interviews. Individual in-depth interviews are appropriate when a sensitive or very complex issue is to be probed, when individual response rather than group response is desired, or when it is difficult to convene respondents in small groups. These interviews can be 30 minutes to an hour long and are used to assess feelings, emotions, attitudes and prejudices which are not normally elicited in the more common public opinion interviews.

Like focus group sessions, individual in-depth interviews should be conducted by an experienced interviewer who follows a discussion outline. A structured questionnaire can be used in

those cases where the researcher is concerned about obtaining respondents' reactions to a core set of items. What a more structured approach loses in depth, it gains in standardization. In-depth interviews can be conducted in most places, but a quiet spot where there are no interruptions is preferred. About 20-30 interviews should be conducted. Arrangements should be made in advance with respondents for scheduling interviews since so much time is required.

Like focus groups, in-depth interviews represent a qualitative method usually conducted with small numbers of respondents. It is not practical to obtain a probability sample in a study of this kind because the costs are so high and the data are usually qualitative, not quantitative, so they are not readily amenable to statistical analysis. The subjective nature of responses and the small sample size require careful interpretation of results. This information, gathered through probing respondents in depth, is to be considered an aid to professional judgment and should not be used to make broad generalizations without further research confirmation using quantitative methods.

There are several disadvantages of using in-depth interviews for pretesting concepts: time and expense involved in recruiting respondents, administering the interviews, and analyzing the results. In-depth interviews are a useful technique when the issue is sensitive or complex or when the group format is not appropriate. They are an excellent way to develop extensive sequential case histories and to examine interrelated components of agricultural practices. Since the conversation is "private", topics can be discussed that would not ordinarily be discussed in public and the respondent is not influenced by comments made by others. Because there are no group dynamics, the quality of the conversations tends to be more personal and more related to the unique experiences of the individual respondent.

3. Central location intercept interviews

Central location intercept interviews can be used to test concepts. Central location intercept interviews involve stationing interviewers at a point frequented by individuals from the desired target audiences. Common examples are markets or bus stops or train stations. The advantage of this method is that a high traffic area can yield a large number of interviews in a reasonably short time. Also, a central location for hard to reach target audiences can be a cost effective means of gathering data. Any information that can be gathered by personal interviews can be obtained by this method; however, the results are not projectible.

A typical central location interview begins with an intercept. Potential respondents are stopped and asked whether they would be willing to participate. Then, specific screening questions are asked to determine whether they fit the criteria of the target audience. If they qualify and agree to participate, respondents are led to a quiet spot where the interviewer, using a structured questionnaire, obtains the respondent's reactions to the concepts.

Respondents intercepted at central locations may not be statistically representative of the entire target population; the sample is usually larger than those in focus groups or individual in-depth interviews. Central location intercept is used when assessment of comprehension, attention, believability and other reactions are essential from a fairly large group of respondents. It is a particularly useful method when testing the product, packaging or price.

Unlike the previously discussed methods, the questionnaire used in central location intercept interviews is usually highly structured and contains multiple choice or close-ended questions. Open ended questioning, which allows for free-flowing answers, should be kept to a minimum because it takes too much time for the interviewer to record responses. The questionnaire should be pretested before it is used in the field.

The major disadvantage of this method is that it is highly structured and does not allow for the spontaneity of ideas of a focus group. Central local intercept interviewing is more appropriate for obtaining reactions to complete messages.

D. Selecting the Strongest Concepts

When analyzing the results of concept testing research, program planners should identify those concepts which are clearest, have the most appeal, and are perceived as the most believable and relevant by the target audiences. These concepts should be used for developing complete messages. Message and Materials development and Pretesting are discussed in Chapter IX which follows.

Chapter IX

MATERIALS DEVELOPMENT AND PRETESTING

[To be revised]

During the materials development and pretesting state, complete messages are developed from the concepts selected earlier. These messages are pretested among the target audience to ensure that they are understood, relevant, and acceptable.

A. Guidelines for Effective Materials Development

There are many ways to produce a message. This section presents a set of guidelines for developing effective messages and materials.

Remember there is only a limited amount of time or space you have in which to convey the message. The message should be relevant to the target audience--in content, character and tone. The message must be interesting and entertaining. Remember that it is competing for audience attention.

Emphasizing that the information in the message is some way new. Select only one or two points that answer the questions: who? what? where? why? Be completely accurate and tell target audiences all they need to know. Don't depend on their writing or calling for information. Present the information in a way that the viewers or listeners can act on the information. Give the audience specific behavior they can perform. If appropriate, demonstrate the recommended behavior and teach the skills required to perform it. Research has shown that the best results can be achieved when the benefits of performing the desired behavior are communicated.

To increase retention, repetition of the subject is important. Slogans can help target audiences remember the messages. However, do not depend on the slogan to communicate the main idea of the message. The presentation used to convey the message must be credible to the target audience. Authority figures can be effective in some cases. In others, a person typical of the target audience may have greater impact. Celebrities may be excellent presenters, but may detract from the message since the audience may remember the personality rather than the message. Too many characters or a crowd scene will

confuse the audience. A testimonial, demonstration, or a slice of life tend to be more effective than a vignette. A straightforward presentation of the facts is often a more effective appeal than fear, humor or warm and touching situations. Inducing fear and using negative appeals often do not work as well as fear reduction or stressing the benefits of compliance. Fear of social disapproval may be the exception.

Humor can be effective but only when it is appropriate to the subject of the message. An appeal to the emotions also can be an effective method of persuasion. Logical or rational appeals seem to be more effective with motivated, intelligent and sophisticated audiences, while emotional appeals work better in motivating those who are indifferent. If possible, communicate both sides of the issue - the problem and the solution.

B. Message Pretesting

Pretesting messages ensures that messages with the greatest potential to influence target audience attitudes and behavior are produced. To avoid possible failures, consumer perceptions of the message are gathered below:

- considerable dollars and time are committed/expended,
- there is a risk of alienating or misdirecting consumers, or
- the point is reached when revisions are difficult or even impossible to make without starting over.

C. What Pretesting Does

Pretesting assesses message recall, comprehension, and other target audience perceptions while the message is still in rough form and revisions are possible and affordable. Pretesting does not guarantee success, but it can reduce some of the uncertainty and risk of producing materials which can be misunderstood or misinterpreted. Pretesting can assist in selecting the most effective presentation among alternative message executions. Pretesting does not help decide if the media chosen are appropriate or if the target audience is the right one. These decisions should have already been made during the planning stages.

D. Producing Messages in the Rough for Pretesting

Rough message production begins with development of a storyboard. A storyboard is an artistic representation of the message. The audio portions are laid out scene by scene. Visuals may be line drawings or photographs clipped from a magazine laid out side by side as though they were frames in a motion picture film. Each main point or scene should have a corresponding visual or script.

It is important that the visuals closely approximate the final message. A good illustrator should be used to create the line drawings for a storyboard. Photographs can be used, but should resemble the images that will be used in the final presentation of the messages/materials. When recording the audio portion, amateurs can be used to reduce costs. After the audio portion (voice and music) has been recorded, it is edited to exactly the right length.

E. Techniques for Pretesting Messages

Methods should be selected to meet the specific needs and objectives of the program. This depends also on the amount of time and resources available. Two common methods are Theater Testing or modifications of it and Central location intercept Interviews.

Theater testing generally takes place with about 100 respondents in 3 or 4 geographic locations disbursed throughout the country. Respondents are recruited to evaluate new radio programs. In fact, they only evaluate new spots. At the session, respondents listen to a pilot radio program with test messages in rough form. The first exposure contains some control spots which remain constant from one test session to the next. The first exposure to the test message occurs in a typical "clutter" situation in which the test and control messages are shown one after another in sequence. The second exposure to the test message occurs in another pilot program, but this time the test messages are heard one at a time in isolated positions throughout the program.

After the first exposure to the message, message recall is measured by asking respondents to recall all the messages they remember and the main idea of each message. After the second exposure, message comprehension is measured and respondents are asked additional questions to assess their reactions to the messages they heard. To avoid interviewer bias all questions are prerecorded. Respondents are provided questionnaires on which to record their answers.

Modified Theater Testing is less expensive than theater style pretesting. In this technique, 50-100 respondents typical of the target audience (from the local cooperative) are recruited. The message could be tested as part of a regularly scheduled meeting. If necessary, members could be asked to come at a separate time. With the help of a local radio station, a 20-30 minute program could be obtained. Programming could be interrupted after 10-15 minutes and 5 spots played. After respondents listen to the program, they complete self-administered questionnaires. Pretesting other spots could be done by copying the tape and inserting a new spot in place of the old one. Prior to using existing commercial materials, be sure that all clearances and approvals have been obtained.

Another method for pretesting spots is through central location intercept interviews. This technique was described in Chapter VIII in more detail. To keep costs down, respondents could be taken from the screening area where they would complete the self-administered questionnaire. This questionnaire will assess recall, comprehension and reactions to the message.

Focus Group Interviews, described more fully in Chapter VIII, can also be used. Individual responses can be obtained by respondents after they screen the materials but before the group discussion begins.

F. Standard Comprehension and Diagnostic Questions for Pretesting Radio and Television Materials

1. Main Idea Communication/Comprehension

- What was the main idea this message was trying to get across to you?
- What does this message ask you to do?
- What action, if any, is the message recommending that people take?
- In your opinion, was there anything in the message that was confusing?
- Which of these phrases best describes the message?
Easy to understand
Hard to understand

2. Likes/Dislikes

- In your opinion, was there anything in particular that was worth remembering about the message?
- What, if anything, did you particularly like about the message?
- Was there anything in the message that you particularly disliked or that bothered you? If yes, what?

3. Believability

- In your opinion, was there anything in the message that was hard to believe? If yes, what?
- Which of these words or phrases best describes how you feel about the message? Believable Not believable

4. Personal Relevance/Interest

- In your opinion, what type of person was this message talking to?
 - Was it talking to. . .
 - Someone like me
 - Someone else, not me
 - Was it talking to. . .
 - All people
 - All people but especially (the target audience)
 - Only (the target audience)
- Which of these words or phrases best describes how you feel about the message?
 - Interesting
 - Not interesting
 - Informative
 - Not informative
- Did you learn anything new about (subject) from the message? If yes, what?

5. Other Target Audience Reactions

Target audience reactions to messages can be assessed using pairs of words or phrases or using a 5 point scale.

Listed below are several pairs of words or phrases with the numbers 1-5 between them. I'd like you to indicate which number best describes how you feel about the message. The higher the number, the more you think the phrase on the right describes it. The lower the number, the more you think the phrase on the left describes it. You could also pick any number in between. Now let's go through each set of words. Please tell me which number best describes your reaction to the message.

Too short	1	2	3	4	5	Too long
Discouraging	1	2	3	4	5	Encouraging
Comforting	1	2	3	4	5	Alarming
Well Done	1	2	3	4	5	Poorly Done
Not Informative	1	2	3	4	5	Informative

Is there anything in the message that would bother or offend people you know?

6. Impressions of Announcer

Please select one answer from each pair of phrases which describes your feelings about the announcer.

Believable
Not Believable

Appropriate to the message
Not appropriate to the message

Gets the message across
Doesn't get the message across

Chapter X

PROGRAM IMPLEMENTATION AND ONGOING MONITORING

At this point, the technologies to be used in the initial communication interventions have been selected, farmers and rural families in the pilot region have been characterized, a multi-media communication strategy and preliminary media materials have been developed and tested, initial intensive staff training has been completed, and the communication management structure has been developed. The program is ready to move into the production and dissemination, or educational programming, stage with its attendant formative evaluation and feedback functions.

A strong, well-organized, functional educational programming system is the "heart" of the CTTA communication support system. Inputs and information from all other steps in the communication process flow into the system, and it is the hub around which information flows to and from the farmers and institutions in the agricultural communication network. Characteristics and functions of the communication strategy and educational programming system are presented in Section VII.D. Four factors critically important to efficient operation of the system are flagged below.

A. Communication Program Management

The importance of overall management cannot be overemphasized. The CTTA communication program is complex in that involves an array of functions and institutional involvements. It is demanding in that all functions must be coordinated and performed in proper sequence, adhering to a tight time schedule. Although these are characteristics of the CTTA methodology in general, they are even more crucial in the educational programming system. See Chapter XIII for details concerning program management.

B. Production and Dissemination Schedules

Scheduling of program materials production and dissemination is critically important in any agricultural project, including CTTA. Agricultural production practices are time and location specific.

Information given in communication interventions must be synchronized with the agricultural cycle.

The scheduling of message sequences and development of channel strategies (see Chapter VII, Section D.5) must be done well in advance of the time that farmers will have need of the information, as a period ranging from several weeks to several months is required from the time a decision is made by the project to seek transfer of a given technology to farmers until informational or educational materials are ready to disseminate.

At the same time, flexibility must be maintained to adjust the strategy--sometimes on very short notice. Unanticipated constraints and problems--such as drought, flood, scarcity of needed inputs, drops in product prices, etc.--are inevitably encountered which require immediate response in the educational program. Also, new opportunities emerge--such as unanticipated research breakthroughs, newly developed markets, water becoming available for irrigation, installation of a new local radio station, organization of a strong cooperative or other farmer organization, and so on. The project must be prepared to take advantage of such opportunities in its educational program.

Strong leadership and management, close coordination, well-informed staff, and interdisciplinary involvement are keys to preparing and adhering to appropriate and realistic production schedules. Guidelines for developing production schedules are presented below.

1. Annual schedule of message sequences

Development of a realistic message sequence schedule synchronized with the agricultural cycle requires interdisciplinary involvement. This can be accomplished effectively through forming a small permanent working group comprised of the communication program director, head of material production, head of investigation/evaluation, and representatives from extension, research, the private sector and the farming community.

Convene a meeting of this group annually at least two months before the start of each programming year to:

- Determine the themes (use of improved seed, crop planning, etc.) that will form the core content of the next year's educational program. The schedule will be most manageable if the number of major themes is limited to no more than 25--it may be less. Include as subthemes the specific technologies to be stressed. In deciding what themes and subthemes to include, review and consider information from assessments of available

technologies, developmental and formative evaluation studies, and feedback from farmers and institutions in the communication network.

- Prepare an annual "message calendar" which indicates the periods during the year in which information related to each major theme and subtheme will be disseminated to farmers through the various media programmed in the communication strategy. An annual message calendar developed and used in the Guatemala Basic Village Education Project is shown in Figure X.1 to illustrate the concept.

Distribute copies of the annual message calendar to all project personnel and those collaborating with the project, as it will guide all production and dissemination activities during the year.

2. Production, distribution and dissemination schedules

Prepare production, distribution and dissemination schedules at least two months ahead of the dissemination date and update them monthly.

Revise the schedule immediately when there is need for deviating to respond to emergency situations or take advantage of unanticipated opportunities.

Distribute the schedules and revisions promptly to all communication staff and others as appropriate.

Develop and use a schedule format which includes the following types of information for each communication intervention:

- content theme and subthemes;
- specific behavioral objectives;
- media to be used, and type of presentation;
- weekly job assignments, with deadlines for completion of each;
- pretesting schedule;
- date on which final production must be completed;
- date on which distribution of materials must be completed, the method of distribution, and to whom they are to be delivered;

MESSAGE CONTENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1 Agricultural credit												
2 Crop planning												
3 Agricultural inputs												
4 Soil preparation												
5 Soil conservation												
6 Planting												
7 Fertilizers												
8 Agricultural practices												
9 Insect control												
10 Disease control												
11 Weed control												
12 Harvest												
13 Storage												
14 Marketing												
15 Drainage												
16 Production costs												
17 Soil sampling												
18 Farmer organizations												
19 Public agricultural services												
20 Miscellaneous												

Figure X.1. The Basic Village Education annual calendar of agricultural messages for 1976 programming in the Occidente region of Guatemala.

16.

- date on which materials--such as prerecorded radio programs, audiovisual materials for staff training or use by extension agents in group meetings, or handouts at field days--are scheduled for use in the communication support program.

Maintain constant supervision and coordination to assure that all deadlines are met.

C. Distribution of Media Materials to Dissemination Point

Communication staff, in collaboration with extension, are normally responsible for distribution of project-produced educational materials to the point of dissemination. The means through which they are distributed varies depending upon proximity of the dissemination point to the production site, available transportation and communication facilities, institutional capabilities for distribution, cost, and the reliability of alternative means. Whatever the means, constant checks are necessary to assure that the materials have been delivered on time and in good condition.

Communication staff, again in collaboration with extension, also have responsibility to verify that the media materials are used when and as scheduled.

- Monitor radio stations to determine if the spots and programs are aired according to schedule.
- Verify the use of materials by extension agents and other institutions and firms participating in dissemination through unannounced spot checks.
- Use feedback from the field to provide a continuing check on whether or not the materials are used as planned, as well as on the effectiveness of that use.

D. Ongoing Monitoring

Ongoing monitoring of project performance is essential to assure that the communication support program is operating effectively and as planned. This can never be assumed.

Monitoring objectives are to measure project performance against what is programmed in the integrated action plan; and to identify

needs for mid-course corrections or improvement so that corrective action can be taken promptly and appropriately.

Feedback from both farmers and field workers, formative evaluation studies, networking, supervisory visits, training events and observations of others interested or involved in the program are major sources of the information needed for effective monitoring. A systematic approach to collecting, analyzing, distributing, and acting upon information from these sources is essential to the monitoring process.

Internally, the CTTA long term communication advisor and his/her host country counterpart are responsible for developing formats to be used, supervising collection and checking of information, analyzing results reported, and taking appropriate action to correct identified deficiencies or problems. They should draw upon summative evaluation specialists, behaviorists, social marketers, agricultural researchers, and extensionists for assistance in these tasks.

The host country project director and long term communication advisor are also responsible for maintaining close contact with relevant host government authorities and the USAID project monitor to keep them informed of progress, problems and midcourse adjustments needed and/or made.

Chapter XI

FORMATIVE EVALUATION

A. Introduction

1. What is formative evaluation?

Formative evaluation is the use of rigorous research techniques during the life of a project to collect information to guide decision making about how to make that project function well. As will be seen in Section B below, it has close connections to, and sometimes indistinct boundaries from, other kinds of information collection for decision making in the CTTA methodology. Ultimately, the most important distinguishing factor about formative evaluation is the use to which the information is put, rather than anything about the methods used or the timing of the activity.

2. Why does one do formative evaluation?

One conducts formative evaluations in order to determine accurately whether the various elements of a program are functioning together as planned. This includes but is not limited to measurements of whether the messages have indeed been broadcast or disseminated as planned, whether they have been appropriate to the local situation, whether they have been acceptable to the target audience, and to what extent they have been believed and acted upon. One investigates these issues in order to make immediate changes in the implementation of the specific project.

B. **How Does Formative Evaluation Relate to Other Data Gathering Activities in the CTTA Methodology?**

In order to help set the role of formative evaluation in perspective, a short digression is in order about the other types of data collection and use that are part of the CTTA methodology, and the uses to which that information is put. This manual has described, or will describe in subsequent sections, approximately five different activities that involve significant amounts of

data collection. For simplicity's sake, we will refer to those activities in this section as developmental investigation, the pretesting of messages, feedback and monitoring, formative evaluation, and summative evaluation.

Each activity has in common with the others that it is a use of information about the real world to guide decision making. Each of the activities differs in the level of decision making. The actual data collection methods may vary, but in principle, it is not the means of data collection that is important, but the use to which the information is later put. If one were to make a brief summary of the ways in which information is used, the following relationships would be seen:

- Developmental investigation - information for making program planning decisions,
- Pretesting of messages - information for maximizing message effectiveness,
- Feedback and monitoring - information for making routine operational decisions,
- Formative evaluation - information for making large management decisions, and
- Summative evaluation - information for making program and policy decisions.

1. Developmental investigation

The developmental investigation is marked by the collection and use of information for decision making in program planning. In this phase, information is collected in order to understand the farmer's perspective, to discover any constraints the farmer may face, to get a feel for how uniform or variable the target audience may be, and to give a basis for deciding how to "package" the interventions and messages in the campaign.

2. Message pretesting

The pretesting of messages is done, usually on a sample of the different messages or on prototypes of formats or approaches, in order to ensure that the messages are understandable, acceptable, attractive and persuasive to the audience. The process is one of looking for flaws and problems, rather than looking to make sure that the messages are "OK". The mark of successful message pretesting is the conclusion that a series of changes should be

made in order to maximize the impact of the messages.

3. Feedback and monitoring

Feedback and monitoring are parts of a continuous, systematic collection of information about how well routine parts of the intervention system are working. For example, if the promoted technologies require the use of fertilizer as an input, the monitoring system might include a regular check of the availability and price of the appropriate fertilizers in the local markets. If the feedback system reveals that there are interruptions of supply, the project can respond with action to replenish the supply or to suggest actions that farmers can take in the absence of the fertilizer.

4. Formative evaluation

Formative evaluation is a discrete, episodic activity that is intended to determine whether the project is functioning as planned. It occupies the middle ground between feedback and summative evaluation. On the one hand, it can be thought of as a very large scale, quantitative, rigorous, one-shot monitoring of project processes. On the other hand, it can be considered a sort of junior summative evaluation, which is intended to be used in a short time frame to improve the immediate project. It is primarily intended to provide diagnostic information for project managers about how well the goals are being achieved and about where in the overall project mid-course corrections or adjustments should be made.

5. Summative evaluation

Summative evaluation is the measurement of the total impact of a project, with the intent that the information be used to guide decision making about the continuation of the current intervention or about similar activities planned for the future. It places the highest emphasis on the gathering of precise estimates of effects, and correspondingly less emphasis on the timeliness of the results for project managers. It is most likely to take a global view of the project and to use experimental or quasi-experimental methods in the evaluation process.

C. What Research Methods Are Used in Formative Evaluation?

The major criterion for the choice of research methods is utility. As was said before, it is the use of the information and not the methodology used to collect it that distinguishes formative evaluation from other activities. The most common type of research methods is a survey on an intermediate size sample, but this is because it usually offers the most utility in the situation.

For example, one might be interested in assessing how much penetration is being achieved by a print media component of the intervention. Part of the concern here is to be able to plan the investment in print versus other channels in the remainder of the project, and part is to diagnose how well the print distribution system is functioning. The response under the feedback and monitoring level of data collection would be to check with the distribution centers regularly to make sure their stock was moving through on a steady basis, and perhaps to spot check households to see if they possessed or had ever seen any of the print materials. However, at the formative evaluation level of analysis, these estimates of what was happening would be too rough to provide the necessary understanding of what the project impact was. Hence it would probably be necessary to conduct a sample survey in order to be able to estimate what proportion of the target population was being exposed to the print materials (and from there decide whether to adjust the emphasis given to the print component or to beef up the distribution effort).

The difference between the research methods employed for formative evaluation in this example and those that might be employed in a summative evaluation of the same issue are probably differences of magnitude rather than differences of approach. For the formative evaluation, it is sufficient to identify (as one possibility) that a major problem exists in the distribution of print materials in two of the districts in which the project is working. It is not important to have an accurate estimate of how big the problem might be; the project response will be the same within a wide latitude of sizes of the problem. Therefore, the appropriate method of data collection for the formative evaluation is a smaller sample survey, perhaps with less extensive attention paid to careful sampling, than a summative evaluation would conduct. In tradeoff for the reduced accuracy, the formative evaluation measurement would be less expensive to conduct and could be completed much more quickly; both factors are important advantages in the context of formative evaluation activity.

Survey work is not the only appropriate data collection method for formative evaluation. Depending on the question to be answered, one might use:

- observational methods (perhaps in order to avoid problems of self-report of impact);
- direct measurement (such as crop cutting, planting density measurements, soil analyses, or the like);
- secondary analysis of archival data sources (such as the use of agricultural cooperative data about the productivity of the member farms;
- open or structured interviewing (as one might do with extension agents to determine their subjective assessments of how well a project is working;
- ethnographic methods (if, for example, the questions to be addressed clustered around issues of cultural acceptability of the promoted practices).

The choice of method should be driven by the uses to which the information will be put.

D. How Are Decisions Made About When and What to Evaluate

In the realm of formative evaluation, the decision about when and what to evaluate should be seen as an exercise in applied cost-effectiveness analysis. The allocation of formative evaluation resources should go to those areas where there is greatest potential for maximizing impact or saving money.

For example, if a government maintains a program of input supply that is parallel to a commercial distribution system, it might well be worth putting considerable evaluation resources into seeing how the government system works. A possible outcome is that farmers typically use the commercial suppliers in any case; it may be that the commercial suppliers give credit, or that they are more reliable than the government depots, or that the commercial distribution system penetrates much more deeply into the rural areas. Information collected about the users and constraints related to the government system could easily lead to a decision to shut down or reform the government distribution channel, which could result in a significant savings. That would merit a major allocation of formative evaluation resources. On the other hand, if the political circumstances are such that it is impossible for the government to abandon the parallel distribution system, there is little point in investing in measurement of its role, because no decision will be made as a result of the information.

Similarly, a relatively inexpensive investigation into constraints on how farmers behave could produce large results. For example, it would not be difficult to examine what farmers know about how to mix and apply pesticides to certain crops. A likely finding would be that they have specific information problems that lead to much less effective use of pesticides. The type of specific information deficits they might have could concern the actual mixing procedures, the application density, and the repeated application frequency. If the formative evaluation identified a problem in these areas, it would be a simple and inexpensive matter for the project to respond. It could provide print materials (perhaps reformatted to enhance their communication capability, particularly with poor readers), or emphasize the correct information in radio broadcasts or slogans, or provide special training for the extension staff to involve them in resolving the problem, or all of the above. None of the responses is very expensive for the project, and all could result in great improvements in effectiveness of pesticide use.

In summary, the best candidates for formative evaluation topics are those areas in which the project can make a response to the evaluation findings. Within those areas, choices should be made on the basis of the probable magnitude of the impact that reforms based on the evaluation data might have, tempered by the cost of collecting the relevant information.

Chapter XII

PLANNING, REVIEW, REPLANNING, ADJUSTMENT

The Project Implementation Plan (PIP), which must be prepared and approved before long term staff can be posted in a collaborating country, is the first major CTTA planning step. That plan provides the framework for life of project development and implementation. Since the PIP must be prepared before developmental and related investigations are undertaken, it is necessarily broad, and cannot provide the details of planned project operations.

The second major planning step is an integrated action plan (IAP) to be developed by the host country project director and long term agricultural communication advisor within six months of the advisor's arrival at post. The IAP fleshes out the framework presented in the PIP, and includes detailed plans and schedules for each of the project's activities during the coming year. (A suggested organization of the IAP is given in Chapter VII, Section D.)

Systematic review, replanning and program adjustment are essential to achievement of CTTA objectives. Although the initial investigation will provide the foundation on which communication interventions will be developed, elements of it need to be repeated or pursued further during the course of the project. The same is true of every other program element, and each element contributes to and draws from all others.

There can be no let-up in monitoring of program impact and in responding with appropriate interventions. Replanning and action to respond to all information collected from developmental investigation, product and feasibility testing, formative evaluation and feedback are continuing CTTA activities, taken whenever the need is revealed.

A more formal annual review of the IAP and adjustments made during the year, required in addition to the continuing replanning and adjustment described above, is to be made under the leadership of the national project director and the long term agricultural communication advisor. All key project staff, government administrators responsible for the project, institutions collaborating with the project, and the USAID project monitor should be involved as appropriate.

Program activities completed in comparison to those planned, information collected through the various investigative and monitoring activities, and summative evaluation results as they become available will be reviewed in detail to:

- assess the appropriateness of adjustments made,
- measure progress, and
- determine those project areas that still require adjustment or revision to enhance the effectiveness of the communication interventions.

The integrated action plan will be updated and replanned annually on the basis of the review, and submitted to the host country government, USAID project monitor and AID/S&T cognizant technical officer for review and approval.

Chapter XIII

MANAGEMENT

The importance of efficient and effective management cannot be overemphasized:

- The CTTA communication program is complex, involving an array of functions and institutions.
- It is demanding--all functions must be carried out in appropriate sequence with several proceeding simultaneously; the communication interventions are highly time-specific; and effective coordination of all project activities is essential.
- It requires a well-structured, program-oriented staff training program, although it is anticipated that host country staff will include people with at least basic training and/or some prior experience in agricultural training, radio broadcasting, print production, and audiovisual materials development and production.

Development of the program management structure starts with negotiation of the Letter of Agreement (or comparable document approved by the CTO) which designates the host country institutions and key personnel and responsibilities related thereto, and responsibilities of AID and the Contractor. Then, the role of the contractor is to advise, assist, and collaborate with the designated host country institutions in defining and establishing an effective and efficient internal management structure. In broad outline, this includes:

- identification of key management and supervisory positions,
- preparing job descriptions for each position, and
- developing organizational charts that define both administrative and functional relationships.

A key management team of at least five members is recommended to administer, manage, and coordinate planning and implementation of the CTTA communication program as described in this manual. They include:

- Host Country Project Director. Responsible for overall strategy development, project management and coordination with other institutions involved (including preparation of the implementation and integrated action plans and required reports in collaboration with the long term agricultural communication advisor).
- Assistant Director for Educational Programming. Responsible for management of the education programming system including distribution of media and other educational materials to point of use, as defined in Chapter VII, Section D.7
- Assistant Director for Developmental Investigation and Evaluation. Responsible for management and supervision of target audience analyses, developmental investigation and formative evaluation, and for coordination and collaboration with summative evaluation staff.
- Assistant Director for Agricultural Message Content Development and Coordination. Responsibilities include leadership--in collaboration with agricultural research, agrosupport, and other relevant institutions --in developing and verifying the technical accuracy and appropriateness of the agricultural messages to be disseminated. He/she must work closely with the assistant director for developmental investigation in designing and interpreting research and evaluation studies, and in maintaining a farmer orientation in the communication interventions; with the assistant director for educational programming in translating information received from research into language and formats suitable for dissemination through the various channels; and with the assistant director for networking, feedback and training on matters concerning agricultural message content.
- Assistant Director for Networking, Feedback and Training. Responsible for developing and managing the systems implied in the title. He/she must work in close coordination and collaborate with the other assistant directors, as well as with extension, research, and public and private sector agrosupport institutions. (See Chapter XV for discussion on Training)

The position titles may vary to conform with the host country's position nomenclature, and responsibilities may be reassigned depending upon personnel available and institutional configurations. For example, a project director may be assigned at the

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national level with a project coordinator at the pilot region level; or the networking responsibility may be assigned to the assistant director for message content development and coordination. It is critical, however, that each of the areas of management responsibility be specifically assigned to an identified individual.

From the institutionalization standpoint, an objective of the project is to provide this management team with the experience, skills, and capabilities needed to provide leadership at the national level for extending the CTTA strategies and methods more broadly throughout the country. In some countries, a national team may exist or be established at the outset of the project. This is to be encouraged where it does not jeopardize pilot project operations, as it can increase the pool of trained management personnel and facilitate the institutionalization process.

Chapter XIV

INTERINSTITUTIONAL COORDINATION, COLLABORATION, AND NETWORKING

The importance of effective coordination, collaboration and networking with an array of institutions and organizations has been a recurrent theme throughout the manual. The CTTA communication support program cannot be planned and implemented without them. They are grouped together in this chapter due to their close interrelationship--none can be achieved without attention to the others.

The institutions involved include those in the agricultural sector such as extension (of which the communication support program is an integral part), research, public and private sector providers of goods and services, farmer organizations, cooperatives, etc. The Honduran National Agricultural Research Foundation (FHIA) and similar institutions in other collaborating countries are especially crucial in the research area.

Beyond these, information exchange and collaboration are also needed with educational, governmental and private institutions, programs, projects and individuals from sectors outside agriculture who can provide the expertise in social and behavioral science, social marketing, psychology, anthropology, advertising, and technical communication skills needed to provide technical guidance in these areas. Involvement of such resources is not only cost effective and helps to assure that guidance received is relevant to the local environment, but also contributes to the institutionalization process.

Contact and coordination with regional and international institutions and programs must also be developed and maintained. Examples include institutions such as the International Agricultural Research Centers (IARCs), Collaborative Research Support Programs (CRSPs), and Social Marketing International (in Mexico). Agricultural technologies and relevant expertise needed for the communication support program are not limited by country boundaries.

Effective interinstitutional coordination and collaboration requires concentrated effort from CTTA personnel--both host country and project advisors--to inform relevant institutions about the project, to help them understand the relevance of the CTTA strategy and methodology to them and their programs, how coordination and/or collaboration with CTTA can work to the

benefit of both, and to build support at both the administrative and working levels. The objective is two-fold: to coordinate and collaborate with other institutions as needed to develop the CTTA methodology; and to develop the coordination/collaboration process to the point that it becomes institutionalized.

In addition to the ongoing coordination achieved through networking and normal interaction, the coordination process can be greatly facilitated through:

- a series of meetings at the outset of the project involving all potential participants in the communication network to inform them of CTTA's objectives, target audience/s, areas of action, organization, methodologies, and anticipated results;
- annual followup meetings with the same group to keep all informed of progress, accomplishments and major problems.

In more specific terms, the following mechanisms are suggested:

- establish an ongoing interinstitutional coordination committee;
- establish an ongoing interinstitutional group to participate in message content development;
- use ad hoc multidisciplinary groups at various stages of the program development process, particularly those related to developmental investigation, target audience analysis, product and feasibility testing, and formative evaluation;
- organize seminars and workshops, including an annual CTTA program workshop, involving staff from collaborating institutions as both participants and presenters or discussants;
- exchange reports with other institutions (both national and international);
- maintain continuing interpersonal contact with representatives of institutions with which the project will coordinate and/or collaborate;
- develop and maintain a viable communication network.

Networking refers to information exchange among institutions and individuals involved directly or indirectly in or that impact upon a project or program. The basis for development of networking procedures will be the various activities and coordi-

nation mechanisms described throughout the manual. Refer particularly to Chapter VII, Section D.9, Collecting and Distributing Feedback and Feedforward.

A preliminary list of specific institutions, organizations and individuals to be included in the network can be extracted from the implementation plan. This list will be expanded during development of the first annual integrated action plan, and as the project progresses. The network extends beyond the country's boundaries to include the international and regional institutions noted earlier, and beyond agricultural boundaries to include institutions, programs and individuals in other sectors with whom CTTA collaborates or which could substantively affect the project. Figure XIV.1, from Honduras, illustrates the networking concept and potential members.

Leaders of other agricultural projects in the country, the USAID project monitor, and AID/S&T project managers are to be included in the network, also, to keep them fully informed of project progress and activities, and developing situations that may require specific attention or action in the future.

Two major factors are important in development and operation of the communication network: the information to be disseminated; and the distribution mechanisms.

Not all members of the network need all information generated by the project, and CTTA will not require all information emanating from all network members. The type and extent of information flow to, from, and among the network members must be determined through interaction with the institutions and individuals concerned. (Refer to Chapter VII, Section D2, for guidance.)

The channels through which information flows depend in part upon the facilities available, and in part upon the urgency of need for the information. For example, teleconferencing techniques are highly appropriate for situations in which several institutions or individuals need to be informed of a problem which requires immediate action. Channels such as telephone, telegraph and personal courier also provide means for transmitting or exchanging urgently needed information. A microcomputer of the research it is also important to gather the general vocabulary of the people as well as compile aspects of culture and folklore such as oral traditions, etc. related to agriculture. This will be very useful in the design state of the messages, in order to select appropriate formats and tones for their presentation.

All of the above provides a vision of the parameters within which the program will be implemented. A detailed analysis of the information concerning these points can furnish imti-directional intra- and interinstitutional flow of information required for a

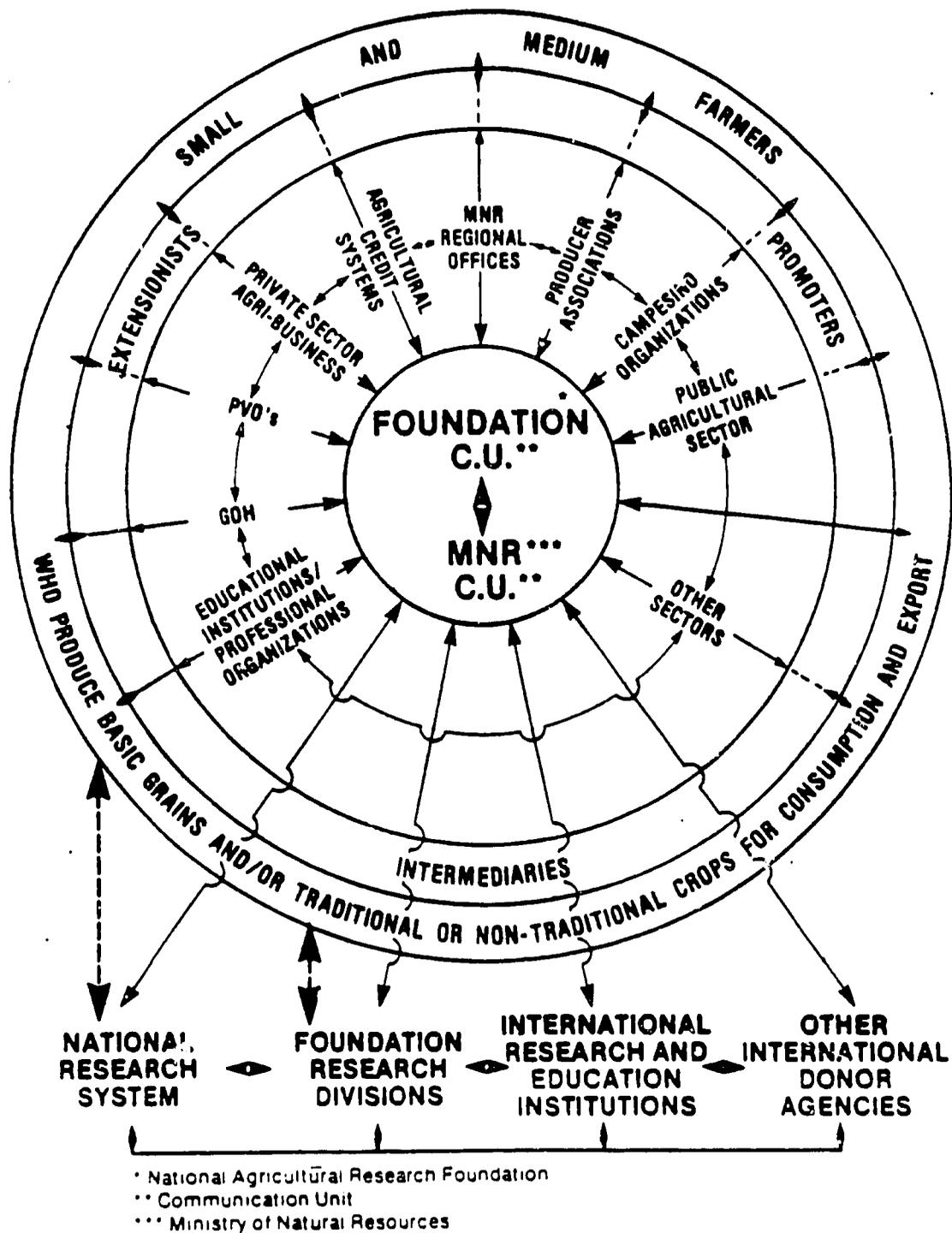


Figure XIV.1. The communication network; an example from Honduras (From Ray 1984)

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successful communication support program.

The networking, feedback and feedforward functions are of such importance that designation of a relatively senior project staffer to have primary responsibility for their planning and coordination is strongly recommended.

Chapter XV

STAFF TRAINING

It is anticipated that host country staff assigned to the CTTA Project will vary widely in communication and media production skills and experience. Although some will have training and extensive experience in agricultural communication, it is not likely that they will have had opportunity to apply the entire CTTA communication process in an integrated, multi-media communication support program.

Communication staff's understanding and use of behavior analysis and social marketing concepts and techniques in an agricultural context will probably need strengthening, and in many cases these may be completely new concepts. Production staff may require additional training in technical skills such as radio production and graphic arts.

Communication skills of extension and other technology diffusion personnel, critical to communication support program success, typically require upgrading. The same is true of their knowledge about the agricultural technologies to be disseminated.

Staff training must receive high priority in CTTA both to plan and implement communication strategies successfully in the pilot projects and to build the capability of national staff to continue an effective program of communication support to extension after the project is completed.

A. Training Sites

Virtually all training is conducted in-country as CTTA does not provide for any out-of-country training. Exceptions will be cases in which national staff participate in CTTA-organized multi-country events such as annual cross-site conferences and the August 1986 training workshop in Honduras for Honduran and Peruvian project staff.

Within a country, emphasis is placed on on-the-job training both in the field and in the media production unit. Short apprenticeships with commercial firms or appropriate public sector units to upgrade technical skills (e.g., graphic arts or radio production) are encouraged.

CTTA organizes training events specifically designed to meet the needs of project staff, and collaborates with extension--and other relevant organizations--to upgrade communication skills of extension and other technology diffusion agents.

B. Internal Staff Training

CTTA training programs are tailored to meet specific needs of the project and its staff. Different positions require different types and levels of expertise and skills. At the outset, the backgrounds, experience and competence levels of staff will vary greatly. All must be brought to at least the minimum level required for their assigned responsibilities before the project moves into the educational programming stage.

As the program grows in scope and complexity, staff will need ever-increasing levels of expertise and skills. Some staff will need to develop new or additional areas of expertise. They must be provided opportunities for their own professional development. Therefore, CTTA training is an ongoing function guided by project and staff needs as revealed by experience and ongoing monitoring.

1. Program leadership development

One CTTA training objective is to develop a cadre of key professionals in each pilot site country to provide ongoing leadership to the integration of CTTA strategies and methods into the national technology transfer system.

Generally speaking, that cadre will include the host country project director (both the national and pilot project directors if they are different individuals) and those in charge of the educational programming system, developmental investigation and evaluation, agricultural message content development, intra- and interinstitutional coordination and networking, and training. Some of these individuals may not be interested in or suitable for such a role, however, so the project will also seek to identify other individuals with high potential who can participate in this professional development program.

A professional development approach is to be used with this group, consisting of on-the-job experience--working with CTTA-provided technical assistance advisors--supplemented with

- reading materials;
- counseling with the advisors and other specialists

available in the country, individually and in seminar situations;

- exposure to projects and programs in other sectors such as health that are using similar communication approaches;
- participation in international CTTA-sponsored diffusion activities; and
- participation in appropriate in-country professional and training events related to agricultural technology, instructional design, behavioral science, social marketing, and other relevant social science topics.

The CTTA long term communication advisor and host country project director are jointly responsible for structuring this professional development program, identifying the individuals who will be included, and assuring that all are provided opportunity to participate.

2. Skills training

The existing national pool of manpower skilled in agricultural training, investigation and evaluation, radio programming, print production, graphic arts, audiovisual production, and other skills required for the communication program will be used to the maximum extent possible. However, additional training will be needed by some at the outset, and all will require continuing upgrading and reinforcement.

Key elements in the CTTA approach to skills training include:

- specific training tailored to the needs of the program and the individual;
- use of CTTA-provided technical assistance advisors and specialists as trainers to the extent possible;
- extensive use of local expertise to provide skills training--e.g., through short courses with local specialists as trainers and short apprenticeships with institutions or firms that have the relevant skills and capabilities;
- emphasis on on-the-job training, the most effective single training mechanism for many purposes;
- study of manuals and training materials related to the particular skills required;

- regularly scheduled in-service training courses and events;
- reinforcement through regular supervision and consultation;

The long term agricultural communication advisor and host country project director are responsible, in collaboration with other technical assistance specialists and the staff member responsible for training, for assessing training needs and developing and implementing a training plan for project personnel. The plan is to be based on the above guidelines and incorporate the approaches presented in Section D below.

C. Communication-related Training for Other Staff

A larger training need in terms of personnel to be trained, and equally critical to success of the communication program, is training of extension and other technology diffusion personnel in communication skills and the agricultural technologies to be incorporated into the CTTA communication interventions.

It will be these workers upon whom the communication program must rely to be effective face-to-face teachers of farmers. They must understand not only the technical content of the information to be conveyed to farmers, but also how to teach--effectively using various interpersonal channels and teaching aids, and relating their work to other media through which the same technical messages are being disseminated.

The CTTA approach is to collaborate with extension in planning and conducting communication-related training as a part of extension training events, especially those in which agricultural technology training is a major objective. This system has several advantages:

- The use of communication skills can be linked with the technical content of messages to be communicated.
- Understanding of the reinforcement provided by other channels and media can be more easily gained when linked to a specific subject matter content.
- Collaboration with extension in planning and conducting training provides opportunity for interaction and joint effort in improving the quality of ongoing extension training activities.

- Communication staff participating as trainers have opportunity to gain knowledge and understanding of the technical content of the communication interventions for which they are responsible.
- It is cost effective.

The same approach is equally applicable to training other diffusion agents such as private sector firm or farmer organization field staffs.

Occasionally, there will be need--e.g., for reasons of project strategy, lack of an extension training course scheduled at a critical time, or the need to bring extension workers and other diffusion agents together for specific training--for CTTA to organize training events independently. These should be the exceptions rather than the rule.

The interinstitutional coordination, collaboration and networking discussed in Chapter XIV are essential to effective CTTA/extension collaboration in planning and conducting training. All project staff, led by the host country project director and long term communication advisor, must be involved in developing and nurturing these working relationships.

The training plan described in Section B above must include communication-related training for extension and other technology diffusion agents.

D. Training Methodology

Training to be provided by CTTA is presented largely in operational terms in the foregoing sections. In all training, the CTTA training methodology addresses training as an agent of behavior change, not an end in itself. It adapts and applies principles from behavioral science in organizing and conducting training, particularly for extension workers and other diffusion agents.

First, analyze existing and needed behavioral patterns in terms which are measurable and observable. These provide the basis for selecting specific training objectives. The inevitable outcome of this process is a list of target objectives that far exceeds the realistic scope of the training program. Thus, what not to teach becomes as important as what to teach.

Insofar as possible, select the people to include in each training event on the basis of the specific objectives for the event determined in consultation with extension or other agency

organizing the event. (Scheduling, travel distances, etc. also must be considered.)

Use the following principles, equally applicable to communication skills and technical agriculture training, as guidelines in selecting the teaching methodology to be followed:

- Give the trainees reasons to care about what they are about to learn.

Goals, principles and rationale should precede instruction in procedures.
- Provide a model to be observed and imitated.

Teaching should be primarily by example, using lecture only to provide rationale and explanation. Where skills are involved, each trainee should actually perform all of the elements under supportive supervision.
- Gradually eliminate "prompts" until the entire performance is carried out by the trainee without assistance.

Initially, the trainee imitates the trainer. Then, the trainer should stop modeling but provide positive feedback at each step taken independently and executed correctly. Finally, the supervisor should provide positive feedback only after the trainee has completed the entire performance independently.
- Analyze the task (or agricultural technology) into its component parts.

This is to assure that nothing is overlooked, and because learning each component is much easier than attacking the task as a whole.
- Use positive reinforcement and help trainees to avoid errors.

The task analysis should make each step in the learning process small enough to virtually assure trainee success from the outset. Each successful approximation should be rewarded with praise. Extensionists should be taught in small steps and encouraged to use positive reinforcement when training farmers.
- Use uniform words, phrases and formulations throughout.

Instruction should be coordinated internally, and be consistent with radio messages, posters, written instructions and reference materials, what agronomists tell their clients, etc.

- Make the learning situation as realistic as possible.
Materials available locally should be used during practice and training sessions.

- Give homework.

The trainees should be sent back to their base of operations with an injunction to use their newly learned skills and knowledge as soon as possible. It is important that only minimal time elapses before the trainee puts his/her newly acquired skills and knowledge to work. Training provided too far in advance of the time that the trainee will use those skills and knowledge may be counterproductive in this regard.

How the trainee learns and what happens immediately thereafter have a profound effect on how well skills are remembered and executed or how accurately technical information is conveyed. Newly learned skills and knowledge are fragile and subject to disruption by a change in setting. Therefore, training should be continued to the point that the trainees are able to execute the procedures or impart information accurately and with confidence when they return to their own setting.

Chapter XVI

TRAINING FIELD TRIALS

The CTTA training approach and methodology involves the introduction of new teaching concepts and materials into both staff and farmer training (including women and youth training in the pilot regions). These concepts and materials need testing in use, analogous to concept and feasibility testing of strategy concepts, etc., as discussed in Chapter VIII. CTTA uses "training field trials" for this purpose.

In a training field trial, experienced observers will observe training sessions in progress to determine what actually happens, the interaction between the trainer or trainers and the participants, and reactions of the participants to the teaching methodology and materials used. Insofar as possible, the observer team will include a behaviorist and a communication specialist.

In farmer training events, a CTTA staff member will sometimes serve as the trainer to gain personal experience in the use of the methodology and materials, and to assess their respective strengths and weakness with respect to achievement of the training objective. This practice is consistent with the principle of teaching by example pointed out in Section XV.D.

The training field trials are an important step in improving the instructional design used for both farmer and staff training. In addition, they serve as a feedback mechanism for ongoing project monitoring.

Training field trials are to be included in the training plan discussed in Chapter XV.

Chapter XVII

INSTITUTIONALIZATION

Institutionalization and extension beyond the pilot region of the methods and procedures developed with CTTA assistance is a major project objective. Evidence that this objective has been achieved will include,

- host country staff sufficiently competent in the CTTA methodology to continue its use effectively in the ongoing technology transfer system and programs;
- needed organizational and staff changes made by the relevant host country institutions;
- policy and/or management directives that reflect the CTTA communication support program approach;
- plans for future-year activities that include expansion of the communication program into other agricultural areas; and
- budgetary allocations that reflect an ongoing accommodation of the CTTA methodology.

Virtually all CTTA activities contribute toward achieving this objective. Those most crucial to the institutionalization process include:

- establishment of the internal program management structure and in-service training and professional development of staff in project management positions;
- the educational programming system and other elements of planning and strategy development;
- staff training;
- modification of extension worker roles to accommodate the new techniques and methodologies, particularly in relation to the application of communication, behavioral science, and social marketing concepts in the agricultural context;
- networking;

- development of capacity at the national level to provide effective leadership to expansion of the communication support program into other agricultural regions of the country; and
- interaction with policy and decisionmakers in the key host country institutions about the methodology and results being obtained to gain and maintain their active support for the methodology being developed with CTTA assistance.

Initial host country government interest in and commitment to improving the effectiveness of communication support to extension programs varies from willingness to try something on a pilot basis to a keenly felt sense of urgency that something must be done immediately throughout the country. The CTTA institutionalization strategy must be flexible and adapted to the conditions and opportunities in each country.

CTTA works closely with key national level staff throughout the program to develop their capacity to provide leadership to expansion of the program based on methodologies developed and experience gained in the pilot project. Typically, in addition to the pilot region coordinator or director, a national host country project director is designated with whom CTTA advisors work closely throughout the project. National level staff are included in training programs, and are substantively involved in pilot project activities.

Some countries will think it urgent to expand the program from the outset, or more rapidly than the support provided by CTTA can justify. In such cases, the pilot project can be used as a training site for staff from other regions who can then initiate the program in their own regions with minimal CTTA support. This activity is to be included in the project implementation plan and annual integrated action plans.

Another possibility, where host government interest and commitment are great enough to justify it, might be to seek additional sources of funding to permit establishment of an additional pilot project in the country. The responsibility of the long term communication specialist in such a case is to work with the host country project director in documenting the need and opportunity, and to inform the CTTA Project Director at the Academy for Educational Development.

Whatever the mechanism proposed, care must be taken to avoid overextending to the point that success in either the original pilot project or additional regions is jeopardized.

Chapter XVIII

SUMMATIVE EVALUATION

A. Introduction

1. What is summative evaluation?

Summative evaluation is the application of systematic research techniques to the measurement of the effect of an intervention. Its purpose is to provide information about the total impact of a project, with the intent that the information should be used to guide decision-making about the current intervention or similar ones planned for the future.

The word summative is used to distinguish the timing of the use of the findings. Other types of evaluation activity (often referred to as formative evaluation) focus on decisions that must be made during the life of a project to improve its current functioning; summative evaluation refers to evaluation undertaken to help decide whether to continue a given project beyond its original planned life or to decide how to structure future projects.

Various schools of thought have arisen concerning the optimal approach to data collection for evaluation and the types of questions that are appropriate. Most of the orientations share a common principle, which is that evaluation is the gathering and use of information for decision-making. The evaluations planned for the CTTA projects are eclectic in their use of different types of data collection procedures and in what perspective to take in defining the objectives of the evaluation.

2. What questions are we trying to answer?

There are four main types of evaluation questions that are relevant -- Campaign Process, Campaign Impact, Technology Impact, and Institutional Process. Each is described briefly below, with more detailed examples given in the section on variables.

- Campaign Process -- what is the best way to structure the relationships among the components of a campaign of this type in order to maximize the impact?

In this model, a sequential series of steps is postulated, the effect of which is moderated or influenced in some way by the action of other factors not controlled by the project. The first step postulates that the target audience is, in fact, confronted with the campaign messages and activities. If, for some reason, little or no evidence of the campaign launched by CTTA can be discovered at the target audience level, it may not make any sense to search for the more distal effects. In addition, differences in the amount of exposure to the campaign elements can be used in the analysis, even though they must be used with caution, since the observed differences are not generally randomly assigned or even under the control of the program.

The exposure to the campaign elements produces an effect of transferring information and changing attitudes about the target behaviors. This effect is influenced by a host of factors representing the general sociocultural environment, a person's individual prior state, and characteristics of the intervention. These are shown in the figure by the arrow coming in from the left. An example would be the skepticism with which recommendations from the extension service might be regarded as a result of prior, less successful attempts.

The learning and attitude change that takes place in turn is related to the subsequent changes in farming practices. Some of the farmers who learn, for example, of ways to reduce the total consumption of irrigation water by following different flooding schedules will, in fact, experiment with or adopt the new practice. At this point, the evaluation must include in its measurements an assessment of the quality and consistency of the behavioral change. For example, a farmer may attempt to terrace his fields without a full understanding of how to do it, and fail to achieve a sufficiently level outcome to withstand erosion at the start of the rains. Or he may begin the terracing activity correctly, but not continue to invest the required effort in developing the terraces. In both instances, the summative evaluation needs to be making measurements that are detailed enough that they capture not only the performance change of the farmer, but also tell how well he has performed.

Farmers' ability to respond with behavioral changes is conditioned by their access to various required inputs, seen as the line coming in from the left. An example of input constraint is access to credit or cash to purchase hybrid seed, even though they may be fully convinced that its use would be beneficial to them.

Changes in farmers' practices are made in the hope of improving the productivity of or the efficiency of the farm enterprise. The ultimate benefit is a bettering of the quality of life for the farm family. Productivity or quality of life changes are

difficult to measure, however, in part because they are influenced by many other factors than just the experimental intervention. The external influences are shown as the environmental and technology-related factors on the left in the figure. Examples of such factors include weather, simple seasonal variation, market price fluctuations, etc.

In general, the model shows that the closer one is to the initial action (i.e., the CTTA intervention), the more direct the effects are, and the easier it is to attribute causality to the CTTA Project because fewer external influences have come into play. The further one gets down the sequential series of steps, the more difficult the measurement task becomes; it is fairly simple to measure changes in knowledge and attitude, but reliable measures of changes in farm efficiency are much more difficult to make.

C. Issues in Evaluation Design

The objectives in establishing a design for the evaluation are to be able to detect a change if one occurs, to be able to distinguish between changes in the intervention group and changes in the non-intervention population, and to be able to attribute differences in the amount of change between the groups to the effects of the intervention. Around these relatively simple sounding objectives has grown up a whole discipline of research methodology. The different components of the design process that concern us here are the design itself, the selection of the variables, the selection of the sample, and the selection of possible control or comparison groups. Each issue is discussed in turn below.

1. Experimental and quasi-experimental designs

In true experimental designs, one can rule out many alternative explanations for the observed results through the initial structure of the intervention. This is accomplished either by randomly assigning treatments or by randomly selecting individuals. Both processes are luxuries that are seldom available to people working with real projects in the field. In this the CTTA project is no exception; it will not be possible to exert any level of true experimental control.

Thus the evaluation will utilize quasi-experimental designs that provide the best available protection from the most likely risks of misleading interpretations. The specific design structure varies according to the immediate threats in a given situation, but the general pattern for the CTTA evaluation is the use of

pre-post measurement with quasi-equivalent control or comparison groups where feasible.

2. Specifying the evaluation variables

In the previous sections discussing evaluation questions and the model of what happens during the CTTA intervention, mention is made of the types of parameters that must be measured in order to answer the overall evaluation questions. This section elaborates on the variables that represent those parameters. The variables are divided into three categories -- independent variables, intermediate or analysis variables, and dependent variables.

The independent variables are the ones that constitute or describe the CTTA's actions, the things done in order to produce some kind of change in the population. The intermediate or analysis variables are those things which one needs to know in order to analyze or interpret the findings. The dependent variables are those that represent the things that the project is trying to change.

a. Independent variables

In the CTTA intervention, there are two basic classes of independent variables -- those having to do with the characteristics and the processes of the intervention itself, and those having to do with the characteristics of the technologies that are being promoted. The intervention characteristics include the amount, quality, intent and format of the materials and processes developed in connection with the CTTA activity. This encompasses the interpersonal contacts and training, public events, the messages transmitted through the media, the print materials prepared and distributed, and any other activities or resource supply undertaken in connection with the project.

In some ways, the campaign itself is something of a "black box" intervention. It is often not possible to disentangle the components of the intervention into separate independent variables, because in a well integrated campaign the same message content is carried in multiple channels. Hence, in a non-experimental environment, it is usually impossible to attribute effects clearly to the different channels.

Nonetheless, there are a number of useful things that can be done to differentiate aspects of the black box, once the campaign structure is known. Internal differences within the campaign can be used to separate some aspects of the intervention for additional study. For example, the quality or emphasis put on different components, or of different versions of the same component can be used to categorize levels of expected

intensity. The intent and format of different approaches, such as the use of radio spots with authority figures to persuade or the use of interpersonal contacts for direct instruction, can also be used as a basis for disaggregating the total intervention.

The second category of potential independent variable is the characteristics of the technology. In theory, farmers may accept or reject a promoted technology either because the CTTA intervention influences them, or because the technology's particular characteristics are compelling or impossible. For example, farmers may correctly believe that an extension-promoted technology will not work in their soil. They may therefore reject the technology, not because the elements of the CTTA intervention were not present and of high quality, but because of the technology itself. Similarly, they may adopt a promoted technology but not achieve productivity increases because, for one reason or another, the technology was not an appropriate one.

The CTTA summative evaluation will place relatively little emphasis on the characteristics of the technologies themselves. The logic underlying this is twofold. First, the number and selection of technologies will be small and nonrandom; hence it is impossible to make many useful generalizations about the ways in which the technology characteristics influence adoptability. Second, measuring the size of production gain the technologies actually produce is a task best done in another context, in fact, it is a task that should have been completed before the technology was considered for promotion in the project.

CTTA is not an environment for testing the efficacy of technologies; it is a project using a particular intervention methodology to induce and sustain change among farmers. As such, the appropriate outcome by which to judge it (and therefore, the appropriate selection of independent variable) is whether that intervention approach is successful in accomplishing change.

b. Intermediate or analysis variables

i. Background Variables

An understanding of the environment in which the intervention takes place is necessary. Background variables can be split into those that describe the overall situation and those that describe the characteristics of the individuals. Examples are:

- Situation-descriptive information -- climate, land tenure system, cropping intensity and patterns, soil types, the agricultural calendar, levels of physical infrastructure, levels of institutional infrastructure such as cooperatives, sources of credit, education, and

extension agent contact, supply of and cost of inputs, market prices, other local development programs, etc.

- Individual-descriptive information -- demographic and socioeconomic status information such as age, sex, education, income or wealth, marital status, family size, media exposure, radio ownership and listenership, farm budget and cash flow, land holding, use of credit, cropping pattern, off-farm employment, level of contact with extension, current practices, level of experience with suggested changes, etc.

ii. Campaign Process

These issues reflect on future decisions about how best to structure similar interventions in order to maximize their impact. The major types of sub-questions are given below:

- Coverage -- what campaign components were available in what places for which segments of the population?
- Exposure -- to what extent did farmers actually come in contact with the campaign?
- Awareness -- how conscious is the audience of the existence of the campaign?

c. Dependent variables

The dependent variables reflect the various outcomes of interest that result from the intervention. They constitute the largest part of the evaluation process and have to be very carefully focused on specific details of the actual intervention. They are summarized here at a fairly global level of description in three categories -- campaign impact, technology impact, and institutional impact.

i. Campaign Impact

These are the most familiar types of evaluation variables, representing the classic direct effects of exposure to the intervention. They include:

- Learning of the information being disseminated in the campaign and of other prerequisite information.
- Attitude changes about the acceptability, desirability, or probability of items or events related to the campaign.
- Mastery of the skills necessary to perform the complex behaviors that are the objectives of the effort.

- Adoption for a first trial of the behaviors and practices that are being promoted.
- Maintenance of the newly acquired behaviors.

ii. Technology Impact

Obviously, the probability that a farmer will adopt a given practice depends in large part on his assessment of the risk and returns such a change might involve. It is important in the summative evaluation of a campaign like this to distinguish cases in which adoption was thwarted either because of farmers' beliefs about, or actual experience with, the technology outcomes. The emphasis here is on gathering information that helps explain the response to the CTTA intervention, not on assessing the value of the specific technology. However, as appropriate for a given technology, the following kinds of questions need to be asked:

- What is the perceived and actual risk for a farmer who adopts a promoted technology?
- What changes in yield are possible, and what changes are actually achieved in practice by the farmers?
- At what cost in resource and labor inputs can these yield changes be achieved?
- How much profit or return-on-investment can the farmer achieve under optimal and actual conditions?

iii. Institutional Process

One of the objectives of the CTTA project is not a direct effect of the intervention. The intent of the overall activity is to create a capacity within the cooperating ministry to continue to carry out similar projects when external assistance ends. Thus one component of the evaluation is to examine the process by which this happens and the degree to which it is achieved. The evaluation questions related to this aspect include:

- What is the process of institutionalization? Does it result from the efforts of a few zealous individuals, or from structural incorporation by the creation of appropriate job and office functions, or from the creation of a constituency and a demand for the services, or some other process, or some combination of all or part of these?
- What are the appropriate criteria for determining that institutionalization has taken place? Is it evidence of allocations of personnel and financial resources, or

D. Special Constraints Facing the CTTA Summative Evaluation

The design issues discussed at a general level in the previous section encounter a number of special constraints in the CTTA project, because of the particular characteristics of agricultural and media-based interventions. These constraints have strong implications for the design choices ultimately made for the summative evaluation.

1. Specificity of the technologies

The technologies available are typically quite specific -- that is, they are appropriate for a limited range of crops or circumstances, or they recommend different types of responses depending on the local conditions. This results in a very inefficient situation if one is sampling farmers in general in order to get a given number of farmers for whom a technology is appropriate, particularly if the behavior in question is not a common one. This is a very strong argument against sampling plans that strive for population proportionality or of direct representativeness.

2. Periodicity of the behavioral cycle

A second major characteristic with consequences for the measurement plan is the length of the period between opportunities to display the behavior. For example, if the target behavior has to do with adding a soil amendment prior to planting, the farmer only has the opportunity to perform once each year. This is in strong contrast to a behavior like use of a latrine, which can be practiced frequently. This has two effects. First, it reduces the likelihood of proper maintenance of behavioral changes once they have been achieved, because the interval between potential trials is so long. Second, it vastly confounds the measurement problem, because one has to wait so long for the proper measurement window, and because the farmer is much more likely to forget or distort his self-report of his behavior.

3. Indiscriminate nature of mass media

Another characteristic of the CTTA which has implications for the evaluation is the indiscriminate nature of the mass media component of the intervention. By definition, mass media usage in the program makes it particularly hard to identify appropriate

nontreatment controls, since the mass media coverage is likely to be very wide. The control problem is intensified, because the coverage radius of broadcasting stations is likely to be large, and the farther one gets from the area, the harder it is to ensure similarity.

Similarly, the indiscriminant nature of mass media prevents one from forming control groups within the broadcast radius, even if there are people who are not exposed to the programs. This is because those people within the broadcast radius of the radio who do not hear the project messages are almost certain to be different in other ways as well from those who do hear the messages. Thus the measurement problems associated with finding a control group and attributing causality to the intervention for any observed differences are made much more difficult by the characteristics of the project.

4. High variability

An additional constraint influencing the plans for the evaluation is the high variability in outcomes, which make it more difficult to detect changes and to interpret them. This is a problem that is more related to the nature of agricultural interventions than it is to the mass media component of the CTTA. There are several contributing factors to high variability. The most significant source of variance is probably extrinsic factors, such as weather on a grand scale, or local rainfall differences on a smaller scale, or farmers' expectations of what market prices will be, or how much confidence they have in the farm-to-market transportation system. These are all things which vary independently of anything under CTTA control, but influence the same outcomes one hopes to attribute to the intervention.

In addition to the extrinsic sources of variance, there is a more subtle intrinsic source. For many of the promoted technologies, there is a strong interaction between the immediate circumstances on a given farm and either the recommended practice or the effect that a standard practice is likely to have. For example, adjacent fields may have quite different soils, each of which will respond differently to a given application of fertilizer. From the farmer's point of view, he would like to have soil analyses done on the fields so that he can determine how to treat each field. From the evaluation's point of view, however, the fact that the fields respond differently is a source of considerable additional variance, regardless of whether it appears as differences in impact in adjacent fields or whether it appears as differences in the behavior exhibited by the farmer in the two fields. Any increase in the "error" variance makes the detection of change more difficult.

incorporation of the approach through adoption of procedures, or through structural recognition in job descriptions and bureaucratic offices, or some combination?

- How can one maximize the probability of institutionalization? What level of external support is required and for what duration? What are the relative roles of technical assistance and financial support? What generalizations can be made about institutional locations of expertise in research, campaign planning, and media production?

3. Sampling

The objective of sampling is to provide a group of respondents for the measurement activity who have known characteristics and who constitute an efficient means of estimating what is happening in a larger group. Sampling is often done with the objective of providing a group that is directly representative of the larger group, but this is not mandatory and is often not very efficient. For example, if one is interested in a behavior that is appropriate for only a small proportion of the population, trying to measure it with a representative sample from the population will be extremely costly and will not provide much additional analytical advantage.

In the case of the CTTA interventions, the activity will be limited to a subset of the country, which will not, in itself, be representative of the national incidence of any given practice. The implication of this for the evaluation is that much higher priority should be set on efficiency than on representativeness. Additional reasons supporting this notion are discussed in the section on special constraints facing CTTA.

The specific sampling activity has to be guided by the ultimate choices in intervention objectives, but it is clear as a general principle that the primary objective of the sampling plan must be to detect changes as efficiently as possible, rather than to permit precise estimates of the true population parameters from the sample values.

4. Control and comparison groups

There are two basic threats to interpretation of findings from studies like these. One is that factors other than the intervention are generating changes (secular trends or history) that might masquerade as changes resulting from the

intervention. The other is that participation in the study of the effects of the intervention alters the participants in ways that influence their measured characteristics or their reaction to the intervention (repeated measures and the interaction between repeated measures and the intervention effect.) The institution of appropriate control groups can provide protection against misinterpretation of data from the experimental groups.

The main protection against the first threat is to have a nontreatment control group -- that is, a group that is otherwise the same but that is not exposed to the intervention. The difficulty, of course, is in locating a group that is the same when one cannot control the assignment of the intervention, as is the case for CTTA. In falling back from randomization to ensure equivalence of the control and experimental groups, one retreats to the quasi-equivalent control group. In circumstances such as the CTTA's, one must weigh the cost and uncertainty of interpretability of differences between experimental and quasi-equivalent control groups against the risk of misinterpretation of secular trend. The decision is not clear cut; there are numerous issues discussed in the section on special constraints that make it difficult to choose a quasi-equivalent control but somewhat risky not to incorporate one.

The second reason to provide a control group is to protect against the risk that being measured either teaches respondents directly or sensitizes them to what is being taught in the intervention. It is fairly easy to reduce the threat of the answers or the behavior of the experimental group becoming nonrepresentative as a result of participation in the study. If individuals are contacted repeatedly, which provides numerous advantages in subsequent analysis, it is necessary to provide a comparison group that is only contacted once so that their measured behavior cannot have been influenced by the previous questioning. This is the functional equivalent of a post-test only group, but different comparison groups can be measured at any point during the life of the project, rather than merely at the end.

This group then represents a control against which a repeated measures group can be compared so that the magnitude and type of the effects of repeated measurement can be estimated. It is usually referred to as a comparison group, rather than a control group (which usually refers to a nontreatment control). The ideal way to create such a group is to ensure equivalence by randomly dividing a treatment group into repeated and post-only measurement groups.

To the extent that comparable control groups from outside the CTTA area can be identified, they should be incorporated into the design. The situation is not promising for very well matched groups, given the diversity of terrain and climate, but it may be possible to incorporate useful external controls for some of the technologies.

E. Probable CTTA Summative Evaluation Strategy

This chapter thus far has discussed two levels of issue -- those issues that underlie the overall approach of the summative evaluation and guide the general planning, and those issues that present particular constraints and cause specific directions to be taken in the development of the design. In addition, it has been noted that many of the final decisions are dependent on the final choice of the technologies for promotion, and hence have to be deferred until that information is available. In this section, the two levels merge into a set of recommendations for a general strategy. Details will have to wait to be resolved until the required information has been determined.

1. Creation of a sampling frame

An attractive strategy for solving the sampling problems mentioned earlier is to depart slightly from the notion of a single experimental group and to create a sampling frame of known characteristics from which the evaluation could draw different groups repeatedly. This would increase efficiency at the cost of a slightly higher initial investment.

The approach involves selecting and conducting initial interviews with a much larger sample than one intends to use at each measurement point. This larger group is later used as a base for generating subsamples of the groups for specific activities. It can also be used with selection criteria for farmers with certain characteristics. It is this latter feature which makes the notion particularly attractive in this context. It avoids the inefficiency of repeating large samples in order to get sufficiently large numbers of farmers with a given characteristic.

The sampling strategy proposed here is designed to provide the benefits of random or population-proportional sampling, but still enable studies to be carried out efficiently on specific subsets of the population. The core of the plan consists of the enumeration of a fairly large number of farm families with identification of their basic demographic characteristics and land and crop patterns. The enumeration gives a group that may be many times larger than will ever be measured in any given study, but it is a group of known representativeness from which subsets can be sampled. Thus, if the practice of minimum contour plowing for hillside maize is promoted, a subsample of farmers with appropriate land can be drawn, and researchers can go straight to their farms. An additional benefit is that the characteristics of the hillside maize subgroup relative to the

population at large are known, so that possible differences or facilitating factors can easily be identified.

This strategy is flexible and offers a number of advantages over pure random samples. For example, surveys conducted at harvest time that involve crop-cutting to generate estimates of yield have a narrow timeframe in which they can be carried out. The enumeration group provides the ability quickly to target a group of farmers who have appropriate fields and who are known to have adopted a certain technology. They also can be compared to a random sample from among a subset of farmers drawn from the same enumeration group who meet similar criteria but who have not adopted the particular technology. In addition, the fact that they are both drawn from a representative enumeration group means that the two groups, adopters and non-adopters, can be compared with each other and with the population as a whole to isolate the characteristics that are associated with adoption.

The main advantages of this approach are that it permits efficient, closely targeted sampling at the same time that it provides information about the relationships between subgroups and the population as a whole. It reduces some of the threat to validity caused by repeated interviews on a smaller sample, because the same level of precision of estimate can be attained by interviewing only a proportion of the larger enumeration group, thus having much of the sample "uncontaminated" by that particular measure. It provides an information base from which special subsets can easily be identified and located, without sacrificing the ability to relate that group to the characteristics of the population as a whole.

2. Quasi-experimental design characteristics

The overall design characteristics follow logically from the sampling plan presented above. For at least some of the variables, there will be an opportunity for a repeated measures design, which will have advantages for some of the technologies that might be chosen. Even so, equivalent groups can be sequestered from the repeated measures to serve as comparison groups for the effects of repeated measures.

If, as is anticipated, the CTTA intervention targets a group of diverse technologies for dissemination, it is likely that the best plan for evaluation will be a series of relatively independent studies examining the technologies separately. If some of the technologies cluster into a group that are appropriate for a broadly defined group of farmers (for example, a cluster of technologies pertaining to farming of vegetables for export), then an integrated study covering the entire cluster of technologies would provide more analytic power.

Chapter XIX

REFINING AND IMPROVING THE CTTA PROJECT MANUAL

As stated at the outset, the purpose of this manual is to provide guidelines to CTTA field staff, host country counterparts and USAID project managers in the planning and implementation of cost effective multichannel communication programs to support agricultural technology development and transfer. At this stage, however, it is designed to provide guidance in planning and implementing CTTA pilot projects, using the iterative and integrated communication process described in the foregoing chapters.

In its present form, the manual represents a first approximation of CTTA strategies and methods. Experience gained through its use in the field will be used to refine and improve the manual, and to make it more useful. This process will continue throughout the project; the definitive version will be finished only at its end.

All CTTA staff in Washington and in the field, all subcontractor and collaborating institution staff involved in the project, and host country project staff have responsibility to contribute to refining and improving the manual--and to revising sections where field experience indicates that corrections or modifications are needed. Suggestions and recommendations will be appreciated at any time; do not wait until the project ends to make them.

The final manual will represent a comprehensive model for planning and implementing cost effective multichannel communication programs to support agricultural technology development and transfer in developing countries, including guidelines for adapting the model to the specific situation existing in a given country, based on CTTA experience and cross-site comparisons.

Please send your suggestions and recommendations for refinement and/or revision of any section of the manual as soon as they occur to you to

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Chapter XX
USEFUL REFERENCES

[To be added]