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MINISTRY OF NATURAL RESOURCES
DEPARTMENT OF AGRICULTURAL COMMUNICATION
COMMUNICATION FOR TECHNOLOGY TRANSFER IN AGRICULTURE
(CTTA)

GUIDE FOR THE PREPARATION OF AGRICULTURAL
TECHNOLOGY TRANSFER PROJECTS

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DCA/CTTA

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Milton G. Munoz*

I N T R O D U C T I O N

Honduras, like other countries, needs an urgent increase in food production to meet the demands of a growing population. In this process, the generation and transfer of agricultural technology plays a fundamental role.

Experiences obtained in the country by means of Rural Extension Programs show the need of working based on methodology procedures that permits to increase the present coverage of families beneficiated and improve the quality of services rendered.

Within the Ministry of Natural Resources (MNR), significant efforts have been initiated recently in this respect, both at a national and regional level. It is important to emphasize here the statements exposed in the document "PROPUESTA METODOLOGICA UNIFICADA PARA LA PRESTACION DE SERVICIOS"(4), in which the technology transfer projects are foreseen as a mechanism to capacitate the farmers so that they know, comprehend and use the technical recommendations generated from agricultural investigations, and improve their present levels of income and life status.

This document serves as a guide prepared by the Agricultural Communication Department (DCA), through the Communication for Technology Transfer in Agriculture Project (CTTA), on how to elaborate technology transfer projects. The document consists of two sections:

- Basic information regarding the transfer of technology projects.
- Development of such projects.

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The document is especially addressed to change agents 1 in charge of the planification, execution and evaluation of the technology transfer activities.

This material will be subject to periodic reviews in order to enrich its contents. The experiences resulting from the execution of a series of the CTTA Project at the Comayagua Regional Office and other areas, will be timely incorporated. The author appreciates observations and comments to the first version from Dr. Howard Ray; Ing. Bertulio Castellanos and Ing. Bonifacio Sanchez.

1 For this guide, change agents considered were not only those technicians from the MNR who work at the Development Agencies, but also those people working for other private and public institutions in programs dedicated to improve farmer's socio-economic situation.

1.- BASIC INFORMATION REGARDING AGRICULTURAL TECHNOLOGY TRANSFER PROJECTS

1.1 WHAT IS A TECHNOLOGY TRANSFER PROJECT?

It is the methodology procedure by which the change agents communicate to farmers technical and social recommendations that will allow them to increase their yield and improve their life status.

1.2 WHY IS IT RECOMMENDED TO WORK WITH TECHNOLOGY TRANSFER PROJECTS?

There are several reasons that justify the use of technology transfer projects. The five major ones are:

1.2.1 They permit the capacitation of farmers, housewives and rural youngsters.

The technology transfer is conceptualized as a teaching-learning process. As such, it is the same as saying that it is required to train farmers so that they can adequately use those technical recommendations obtained from agricultural investigations. At the same time, it is necessary to train rural housewives and youngsters about different aspects related to nutritional education and production activities, in such a way, that they contribute to obtain more benefits for the whole family.

But what does TRAINING mean? Training is "to teach so as to make fit, qualified, or proficient", according to the dictionary. To train somebody not only involves the achievement of developing knowledge and the act of learning, but also developing skills and abilities. This should be taken into consideration, since it allows us to differ what traditionally "is being done" from what is "desired to be done" in rural extension.

To clarify this situation, it is necessary to make a distinction between training and what information and promotion are. They are all communication functions that share some elements among themselves. But all three have different objectives. To inform someone about something does not necessarily implicate a continued process of action, or learning, not even the development of skills and abilities. To promote something has to do with the motivation of the action. It is

BEST
AVAILABLE

necessary, for example, to promote the use of improved varieties; the collection of soil samples, etc. Note that the promotion is closely linked to the process of teaching since the motivation is an essential phase of it. Nevertheless, promotion itself is not enough. It is necessary to go further on.

According to the above, it is considered that a farmer has been trained to a certain practice when he has learned what it consists of; when he clearly understands the reasons why it is required to do it in the way and frequency recommended, and that he has developed the abilities and skills necessary to execute it without the participation of an outside agent.

- 1.2.2 They allow to concentrate the institutional actions to those problems suffered closer by the farmers.

The transfer projects have the advantage that they can be formulated to contribute to solve those priority community problems. As an example, at the Development Agency of El Rosario, as in other agencies of the MNR's Comayagua Region, a series of problems have been detected that, according to the farmers, need to be solved as soon as possible. In the cultivation of beans, the principle problems detected have to deal with plagues, especially "el picudo" and "la babosa". A transfer project in this area for the cultivation of beans, necessarily has to concentrate on the farmer's training to handle those problems.

- 1.2.3 They allow to center the change agent's attention to objectives and not in activities.

One of the major problems faced by the extension programs in many countries is the one which concentrates the thought of the change agents in activities and not in objectives.

For example, the conduction of a demonstrative plot is usually considered as an objective when it really is an activity, which is part of a transfer project strategy in search of objectives previously defined.

The problem of concentrating in activities and not objectives is based, in part, on the planification and control systems used. The quantitative sources have received more attention than the

qualitative. So, programs with physical goals are elaborated represented by a determined number of tours, field days, visits, demonstrations, etc., and on the execution of these activities a follow-up is made. In view of this, the extensionist's concern is centered many times on the execution of X number of activities, without first placing those objectives that they want to achieve with them and the necessary interaction between activities. For example, how the demonstrations are coordinated with the visits to the farm and other communication technics.

With the transfer projects, it is expected that the change agent orient his/her program to accomplish objectives and not activities. It is worthwhile to note that the information required by planification units and financial institutions such as international banks, about activities programmed and executed, can be easily obtained from the transfer project strategy, as it is shown in a sequence order which and how many will be done according to the objectives to be achieved.

1.2.4 They allow to rationalize the use of resources.

The efficient use of the scarce institutional resources dedicated to activities of technology transfer constitute a permanent concern for planning personnel as well as for the officers.

Transfer projects allow to rationalize available resources since transfer actions carried out at extension agencies are organized sistematically. This way, regional directors may make decisions in approving those transfer projects submitted to consideration according to available human as well as physical and financial resources.

As explained further on in this document, the transfer project scheme includes as an essential component, the budget required to execute those transfer activities planned in the strategy. The budget specifies requirements for agricultural supplies, stationery, etc. Thus, with sufficient anticipation, decisions can be made on what, who, where, when, how and at what cost they are to be carried out, facilitating the MNR to make a better use of its resources. The head of the development agency, upon receiving approval for the transfer projects, which his personnel submitted for consideration, obtains official support to carry out the projects.

1.2.5 They facilitated the tasks of supervision, follow-up and evaluation.

The transfer projects allow to carry out a close control of the execution of activities programmed since a schedule for each foreseen step in the strategy is available. At the same time, the fact that each step or activity within the strategy has a defined person responsible, also allows to make a close follow-up of the functions achieved by the staff in charge of the project and the supporting units that intervene in the process (e.g., Communications, Water Resources, etc.).

The advising activities to the agencies are also facilitated, since it is known who is in charge of what responsibilities within the project. In some cases, for example, investigation program support in technical issues are required. In other instances, support in budget programming issues, etc., is also required, and in these cases, specialized units at the regional offices play an important role.

The evaluation, which is considered as a permanent activity is eased greatly within the technology transfer projects, since, in the first place, it is originated from a clear definition of goals to be met from the transfer activities. In the second place, the detailed records of audiences, messages, areas, media and specially the STRATEGY permits the change agent to evaluate the progress achieved and the factors which have helped or constrained such achievements.

Simple records, such as punctuality assistance to programmed events, within the communication strategy program are of great use in this case. In summary, transfer projects permit the change agent a permanent feedback with which he can gradually improve those strategies to capacitate the rural family.

1.3 WHICH ARE THE COMPONENTS OF A TECHNOLOGY TRANSFER PROJECT?

A transfer project is integrated of twelve components, closely linked, in other words, interdependent. These are:

- (1) DIAGNOSIS
- (2) OBJECTIVES
- (3) MESSAGES
- (4) AUDIENCES
- (5) AREAS
- (6) MEDIA
- (7) STRATEGY
- (8) RESPONSIBILITIES
- (9) CALENDAR
- (10) BUDGET
- (11) EVALUATION
- (12) APPROVAL

II.- DEVELOPMENT OF AGRICULTURAL TECHNOLOGY TRANSFER PROJECTS

Transfer projects should be developed for each one of the priority production systems 2/ of the region attended by the development agency. To develop a transfer project about a production system considered as very important to the zone, each one of the following components should be completed:

DIAGNOSIS; OBJECTIVES; AUDIENCES; MESSAGES; AREAS; MEDIA; STRATEGY; RESPONSIBILITIES; CALENDAR; BUDGET; EVALUATION and APPROVAL.

Following is a description for each one.

2.1 DIAGNOSIS

This phase is one of the most important since it is the starting point of all transfer actions. The diagnosis permits to determine, among other things: (a) which are the technologies that the farmers use in the priority production system; their level of knowledge and attitudes, and the problems they consider most urgent to solve in this system; (b) what is the availability and flow of technologies to feed the transfer actions into this system; (c) what are the farmer's socio-cultural characteristics and customs; (d) what are the present policies in relation to the agricultural production; and (e) the existence or not of private and official agrosupport institutions in the area, which may contribute to facilitate the adoption of technologies by the farmers.

2.1.1 Identifying Most Felt Needs

The farmer faces many problems in each one of his production systems. Nevertheless, not all are of the same importance to him. Therefore, it is important to know during the diagnosis phase which are his priorities. For example, for some farmers it may be more important to control a plague than to fertilize his crops. Depending on the degree of information that is more closely related with his needs and preferences, a better result is expected since there is a disposition to learn. Of course, there might be important technical problems which are not seen as such by the

2/ The principle criteria involving priority agricultural production systems are: number of farmers that have the system; area cultivated; importance in the generation of income; importance of their nourishing diet and in the generation of employment. The priorities for the livestock production system should be done based on productive zoological rates. For more details, please refer to the document: Propuesta Metodologica Unificada para la Entrega de Servicios. Paa. 10-11.

farmers. Therefore, a permanent interaction of the technicians --investigators, communicators and change agents-- with the farmer, is essential.

In order to determine the farmer's most felt needs, it is necessary to understand his knowledge, attitudes and behaviour in relation to the local production technologies. This information may be determined through questionnaires, structured interviews, case studies, focal groups and other similar technics. The important thing is to determine what farmer= know; what they are doing; how they do it and above all, why they do it in such a way. In other words, the farmers' behaviour should be understood. From this information, it is recommended to proceed to apply a participative diagnosis technique 3 by means of which farmers indicate which are, to their understanding, those problems felt as more important to solve. To execute a participative diagnosis, it is recommended to invite the farmers to a meeting at their community through their leaders (teachers, mayor, etc.), and through different media. At such a meeting, the objectives of the same are explained, which are to know the major problems for each one of the crops and species most important of the area. During the meeting, it is necessary to initiate asking the farmers which are, in their concept, the livestock and agricultural production systems most important of their zone. Then, the first production system is selected and it is asked which are the major problems that they have with such production systems. Subsequently, the following systems are covered. It is very important to obtain an active participation from the audience. Monologues should be avoided.

Once the farmer's priority problems are detected for the main production systems, their analysis at the office level follows. It is clarified that the list of priority problems needs to be updated with each crop cycle, due to the dynamic existing in the farmer's production systems.

Once the priority problems list is known, it is necessary that the change agents evaluate themselves as to how much they know about the levels of knowledge, attitudes, abilities and skills that the farmers, housewives and youngsters

3/A guide to this issue is presently being prepared.

are handy with regarding priority problems detected. Remember that the transfer of technology is conceptualized as a teaching-learning process. Training is looked for, and it is necessary to begin from the present situation or as to what we have in relation to "educators" and "pupils". For example, if "el picudo" is rated as a priority problem, it is necessary to diagnose if the change agents are capable of teaching the methods of preventing and controlling "el picudo". It is known to everybody that no one can teach what he/she does not know. On the other hand, within this phase it should be also asked, what they know, what they do, and what disposition the farmers have to learn and develop skills to prevent and control "el picudo". Upon the degree of reliable information available regarding these aspects, there is much more capability to establish agricultural technology transfer projects which contribute to achieve objectives.

The training, technical as well as educational, of change agents, should receive high priority. Such training must consider their needs and preferences. Personnel at the regional level --Extension Director, Human Resources, Investigation and Communication-- must have a broad participation in the planning, execution and evaluation of these activities. It is to be clarified that plans for technical and educational updating must be permanent. This way, researchers, change agents and communicators will be able to "speak" the same language. Training, if possible, should also cover staff from other institutions, at the private and public sectors.

Agricultural input suppliers should keep up with investigation advances, as well as supervisors, creditors and technical assistants from other institutions.

2.1.2 Identifying Technologies

Once farmer's felt needs have been detected, it is necessary to determine what technologies are available to solve such problems. The possibility will be that for some problems there will be recommendations available, for others there will not be any. Analysis of technologies available to be communicated to farmers should be done carefully by researchers, economists, communicators and extensionists; and, among other factors, the situation of availability and access to inputs and the existing incentives for production should be considered.

Analysis of technologies available should specifically cover the following aspects:

- Has it been generated in/or for the zone it is intended to be disseminated?
- Is it compatible with the practices made by farmers?
- Is its application very complex?
- Is it feasible to segment it?
- Does it require the use of inputs not available in the region?
- Will the yield be better than the one obtained from the technology to be replaced?
- Will the farmer undertake risks?
- Is credit required for its application? Is it available in the zone?
- What impact can the product have for its marketability in the zone?

Note that the technology analysis does not only have to deal with researcher's perspectives, but also with the farmer's and his reality; the change agent; communicator's, input and services providers (credit, etc.).

Those problems felt by the farmers for which there are no answers, will have to be faced through research. In this case, like in the previous ones, a permanent interchange between researchers, change agents, communicators and farmers is recommended in order that research projects continue focusing toward specific objectives and that they are completed in the most appropriate conditions according to the demands of the problem faced. Farmer's participation in the planning, execution and evaluation of agricultural research is essential.

2.1.3 Farmer's Characteristics

The knowledge of farmer's socio-economic and cultural characteristics is critical within both the programs of technology transfer and generation. It is specifically recommended to determine:

- Their levels of knowledge, attitudes and behaviour relating new technologies.
- The vocabulary used in performing their daily work.
- Habits; beliefs; membership to community organizations.

- Education; tenancy; farm size; education level; age, etc.
- Media used and preferred by farmers to obtain agricultural information.

This information is valuable as you can count on a better basis for the communication strategy outline. What would be accomplished, for example, if farmers are invited to a meeting at a certain zone, and they cannot attend due to long distances from their homes to the place where the meeting is to be held? It is, therefore, worthwhile to count on farmer's, housewife's and youngster's desire of learning. Additionally, details must be determined; for example, if the farmers prefer meetings, set up the date, hour and place where they can assist. Thus, with a participative approach, there will be more possibilities to succeed in those technology transfer activities.

In summary, diagnosis should provide with the information of "what we have" regarding priority problems affecting agricultural production; the technology offered (recommendations) to solve these problems and all of that information which helps to outline the communication strategies of farmer's, housewife's and youngster's recommendations.

Based on the previous information, compare what the farmers are doing with their crops with the technical recommendations that the extension agency has (see technical guides). How far or how close are the technical recommendations from what farmers are doing? Here, depending on the zone, the technical assistance received by the community, and other factors, any of the following situations will appear:

- (a) Farmers are not using the agency's technical recommendations. Find out why: Didn't they know them? Don't they believe in them? Financial difficulties? Don't they want to take any risks?
- (b) Farmers are partially using the recommendations; for example, they use the recommended fertilizer, but not in the appropriate amount.
- (c) Farmers are completely using the technical recommendations. In this case, possibly rare, we have to think more in reinforcing and updating activities.

Each one of these situations requires a different communication strategy.

2.1.4 Infrastructure and Policy

The practicality of a given technology for farmers depends, in part, upon their access to credit, markets, inputs, etc. Government policies concerning these and other production and marketing factors, may serve either as incentives or disincentives for adoption, depending upon the policy, (3). Therefore, it is necessary to consider carefully the agricultural infrastructure and policies which will impact upon the adoption of technologies, in the diagnosis phase.

From the analysis made above, you are prepared for the following step: specify the objectives to be accomplished through the communication strategy.

2.2. OBJECTIVES

This aspect is essential in formulating transfer projects, since here is where it is to be defined where efforts are to be concentrated. The question to be answered is " What do I expect to achieve with the farmers, through the communication activities?"

The objective should be directed to obtain a specific product. This differs it from the activities which refer to the things that need to be done in order to obtain the product.

Generally, it is recommended to make a difference between general objectives of transfer projects and specific objectives. General objectives, as its name indicates, refer to macro and global products. On the other hand, specific objectives are those partial products which altogether allow achievement of obtaining the global product (general objective). It is to be emphasized that a close correspondence should exist between priority problems that deserve the execution of a transfer project and its objectives.

An example of a general objective for a bean transfer project could be the following:

Achieve that eighty percent of the bean farmers at San Felipe obtain an average production superior to 20 quintales (1 quintal = 100 lbs.) per manzana in the post harvest.

In this case, the priority problem was the mishandling of the bean cultivation at the San Felipe Agency*. This inadequate handling consequently generates a reduced or low average production per manzana. The mishandling is due to unappropriate planting systems; no fertilization and deficient prevention and control of plagues.

Its corresponding specific objectives would be:

- Train bean farmers from San Felipe regarding new technics related to systems used in planting beans.
- Teach bean farmers from San Felipe the most appropriate ways to fertilize the crop.
- Train bean farmers from San Felipe regarding appropriate ways to prevent and control major crop plagues.

The case of a transfer project regarding family improvements would be:

General objective: Achieve that eight out of ten families in San Felipe improve their present living conditions.

A specific objective would be: Teach housewives from San Felipe how to build a Lorena stove.

In summary, the objective is the achievement to be obtained from the execution of transfer projects. There are general objectives and specific objectives. Remember, when formulating the specific transfer objectives that your main mission as a change agent is to capacitate!

2.3 MESSAGES

In this issue, it is necessary to specify what is to be communicated for the accomplishment of each one of the formulated objectives. The preparation and permanent updating of technical guides per agency is essential. At the same time, a permanent interaction between researchers, input and service providers and change agents is highly desirable.

The selection of technical recommendations should be done carefully, in such a way that with its application, the farmer will obtain a higher net income. The definite selection of message contents must consider the relation of what is being recommended with what the farmers are doing. The benefits as well as the risks must be considered in detail. In the same case in which recommendations demand

*Fictitious name.

the use of inputs, it is necessary to precise the places where they are available and its costs.

To illustrate the case of messages, it will be necessary to go back to the bean example previously described. Note that the specific objectives are oriented to the farmer's capacitation in three basic aspects: planting systems; fertilizing and prevention and control of plagues.

According to the above, it is necessary to review the technical guides in order to determine which recommendations are being given in those cases. For the example given, we would have:

3.1 Planting Systems.- It is recommended to the San Felipe bean farmers to plant the bean in furrows with a distance of _____ centimeters, placing a seed every _____ centimeters. Advantages of this system against traditional methods are the following:

- a) _____ b) _____
c) _____ etc. (Include other important details).

3.2 Fertilizing.- At the San Felipe zone, it is recommended to apply 1-1/2 quintal per manzana of 18-46-0 or 17-50-0. The fertilizer should be applied in bands, at the bottom of the furrow, when planting. (Include other details considered important).

3.3 Prevention and Control of Plagues.- In this issue, the following aspects must be specified:

- (1) Type of insects that attack the bean in the San Felipe zone.
- (2) Insects that are constituted as plagues in San Felipe.
- (3) Soil plagues.
 - Characteristics of each plague and the damage causes.
 - Ways of prevention.
 - Ways to control it.
- (4) Follage plagues.
 - Characteristics of each plague and damages caused.
 - Ways of prevention.
 - Ways to control it.
- (5) Other important plagues.

Each one of the issues mentioned above must be carefully described. Thus, the technical recommendations or message contents to be disseminated are explained in relation to each established objective.

2.4 AUDIENCES

In this issue, a list of farmers to be attended in a direct or indirect form with the transfer project should be presented. The farmer's names must be reported by village. The farmer's specific identification facilitates the evaluation; supervision and followup activities.

The list of farmers attended through the transfer project should be as complete as possible. In such a way, we look into multiplying the actual coverage of rural families utilizing the appropriate combination for each situation of individual, group and mass media.

Note that the farmers are not all the same. Some can read and write, others cannot; some have large farms, others small; some are owners, others are tenants; some are members of reform sector groups, others are not; some are willing to incorporate new technologies, others are more cautious; etc. Due to the above, it is very important to know the audience, and specially, its social, cultural and demographic characteristics, as explained before, in order to obtain a better communication with the farmer.

Once farmers' characteristics are determined, it is possible to "segment" the audience. In other words, establish sub-groups, based on their characteristics, preferences and other factors, which can be approached with relevant messages, adjusted to their particular situation, by means of the most appropriate communication strategies.

The segmentation of audiences is also very important when its relation with a recommended technology is analyzed. Which is the audience's experience in relation to the recommended practices? What is the availability and real access to certain services and inputs? What is the real capacity to apply the required processes for the new technology? What are the main existing differences regarding the knowledge about the technology? Note that the same content may be appropriate for the audience in general, but its presentation form may change for different population sectors. In other cases, there may be messages that are only important for a reduced sector of a region.

The above emphasizes the need to know in the most detailed

possible manner the audience, the messages, the media and the resources that are available in order to establish effective communication strategies with the farmers.

2.5 AREAS

This point makes reference to the project's geographic coverage, which can be various municipios or villages, according to the objectives planned. What is important here is to clearly indicate the sites where the transfer project is to be executed.

2.6 MEDIA

In this issue, it is necessary to define what communication media will be used in the transfer project to meet the objectives planned. It is convenient to precise that all media (tours, visits, radio, etc.), have advantages and disadvantages. Therefore, it is necessary to be very careful in its selection. What is desirable and necessary is to benefit from the advantages, simultaneously, by means of a communication strategy based on a combination of individual, group and mass media, obtaining a mutual reinforcement which results in a higher impact than that obtained through just one media. With this approach, a major coverage of farmers is assured and the extension service is improved at a lower cost.

The selection of media to be used depends on various factors such as the objectives to be achieved; the audience's characteristics --are they owners? literate? young? adults? etc.-- the messages and the characteristics of the media itself. Furthermore, it depends on the use, availability and access of the audience and its cost.

There are a great deal of media or communication channels which can be used in the transfer projects. In literature, there are various classifications of communication media. One classifies them according to the number of persons reached individually, by group or massively. The major characteristics of each one of these groups can be seen on Table 1.

TABLE 1
CHARACTERISTICS OF COMMUNICATION CHANNELS

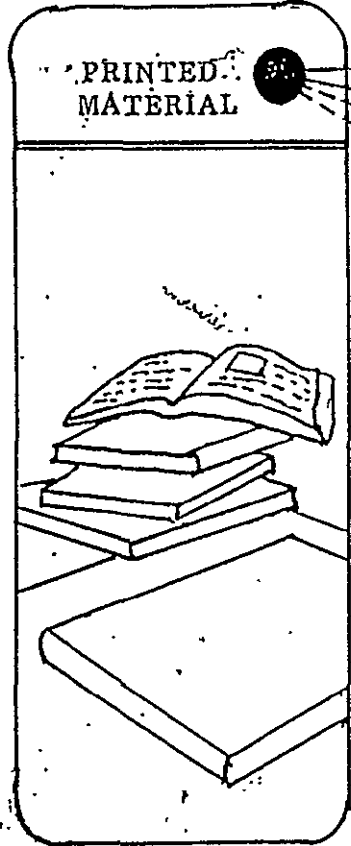
Characteristics	Individual Media	Group Media	Mass Media
1) Message flow	Two way	Two way	One way*
2) Communication context	Face to face	Face to face	Inter-posed†
3) Amount of feedback available	High	High	Low**
4) Speed in reaching great audiences.	Low	Low	Relatively fast
5) Possible effects	Attitude and behavioral change	Attitude and behavioral change	Create attitudes and increase knowledge and adoption.

* It is clarified that some mass media like the radio, has been used successfully in a personalized and located way. Example: In the BVE Project in Guatemala, and in the health sector in Honduras. The radio success in technology transfer projects greatly depend on the way treatment is given to the message and the audience's participation in the program.

**The exception would be the radio, which, when used personalized has demonstrated to be very effective in obtaining a large amount of feedback.

Another important factor to consider for an adequate selection of media, is the one related with the number of senses affected. It is estimated that 75% of learning is reached by the eyesight; 13% by hearing and the percentage left by the other sens. Therefore, it is very important to choose media, such as the audiovisual, which simultaneously affect the eye and ear. The graphics 1 and 4 emphasize the senses stimulated by graphic materials, radio, movies and video and the demonstrations. Note that the method and results demonstrations stimulate all senses.

The group communication channels, such as reunions, method and results demonstrations and tours, supported by radio and graphic materials, illustrated properly and with little text, are highly recommended to carry out technology

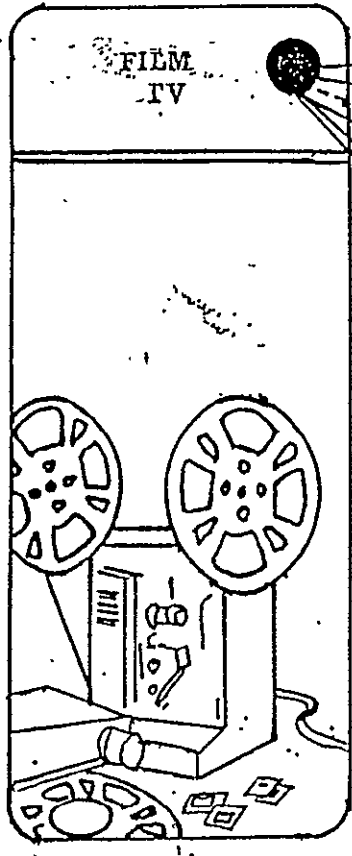


- Black/White (Vision)
- Colour
- Space (Depth)
- Movement
- Sound
- Space
- Smell
- Taste
- Cold/Hot
- Pain/Pleasure

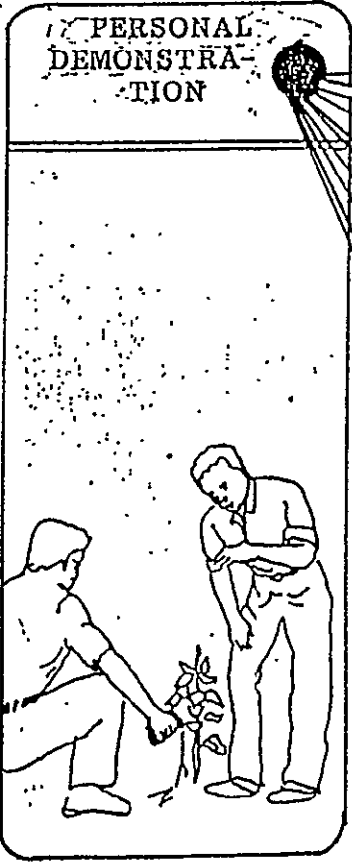
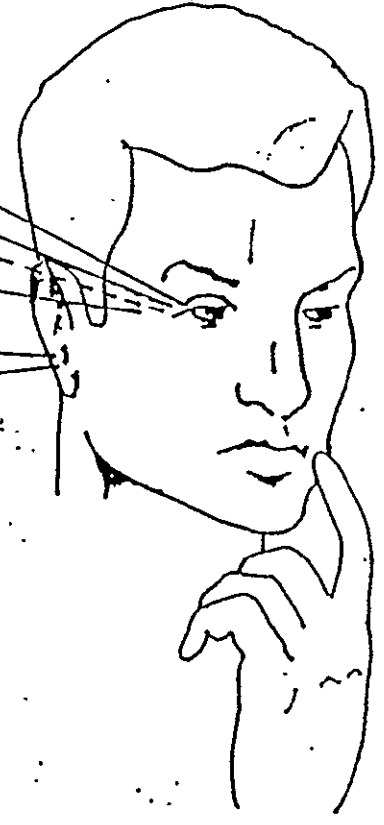


- Black/White Vision
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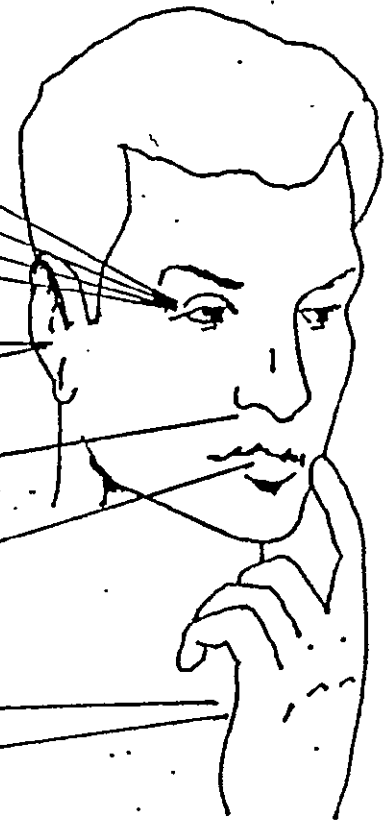




- Black/White Vision.
- Colour
- Space (Depth)
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- Black/White Vision
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- Space (Depth)
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transfer projects. Of course, visits to farms, is also important in this process. but emphasis has to be made on group and mass media to multiply the actual coverage of the extension services.

There are also other media, not less important, such as the local multiple systems of farmer's communication; posters; rural newspapers, fence signs; puppets; dramatizations; projectable series and other audiovisuals which offer a high potential to carry out the technology transfer to farmers. There is much to explore and investigate in this field in Honduras.

In summary, it is very important to work through a combination of individual, group and mass media, in order to make an effective communication strategy that permits to maximize the extension program impact and minimize costs.

2.7 STRATEGY

The communication strategy constitutes the "spine" of the technology transfer project, since it specifies how it is expected to meet the project's objectives.

The communication strategy to be used in the transfer projects varies according to objectives, audiences, messages, media and resources available. Nevertheless, all cases should look forward in using an adequate combination of individual, group and mass communication media.

In the strategy, communication to input distributors and other institution's staff, regarding technologies which are being recommended, and its way of application, should be contemplated. In the case of input distributors, it is necessary to keep them informed about which inputs are required, when and where.

In order to achieve the above, a network is recommended to be established, which will allow a fast and periodic collection of field information, and disseminate it to those who need to know and perform it. This network: must cover institutions in the agro-support sector; credit; marketing, etc., who might get to know with sufficient anticipation the needs of each zone by exchanging information, and therefore, focusing their efforts towards a solution of farmer's problems.

The establishment or activation of an interinstitutional committee in each one of the development agencies is highly recommended. Personnel from these committees should keep top officials of the agricultural sector well informed about farmer's problems in the field in order to facilitate the best decisions regarding the agricultural sector policies.

2.7.1 Strategy Phases

The communication strategy may be carried out in phases. These are: motivational phase, educational phase and reinforcement and sustainment phase. In practice, these phases are very inter-related.

2.7.1.1 Motivational Phase

It is recommended to initiate the communication strategy with promotional activities, since, as explained before, help to create a favorable environment for the community's job.

The major activities that can be carried out in this phase are: visits to formal and informal community leaders; meeting with the community looking for its full participation in the transfer activities; presentation of motivational radio spots and the use of circulating letters. Consultations with personnel from other institutions about the transfer systems from which they have obtained better results in the zone, are also of great value.

During the motivational phase, it is necessary to emphasize the benefits that the community will obtain by working with the Institution, and specially the attention that will be given to the farmer's felt needs.

2.7.1.2 Educational Phase

Once the community is motivated to participate in the transfer of technology activities, it is recommended to define with it a work plan to be executed regarding training.

It is necessary that the community acquires compromises in the activities planned, for example: participate in the selection of the site where the demonstration lot will be established, supposing that its inclusion within the strategy is considered necessary to accomplish the project's objectives; to assist and participate in the meetings and other events programmed; obtain some inputs, etc.

The change agent must utilize all his knowledge and its creativeness in defining the strategy so that the community participates decidedly and actively. Note that the community's participation

in planning, executing and evaluating activities is emphasized. If the community is not well aware about the benefits derived from these actions, it will be difficult to accomplish the proposed objectives. The community must understand that the institutions, such as the Ministry of Natural Resources, by themselves, cannot resolve the problems. But that working together, in an organized way, many benefits can be obtained.

As an example of what the first steps of the strategy to be followed at San Felipe to execute the bean technology transfer project, indicated before, we have:

Activity

- 1) Visits to community formal leaders (teachers, priest, mayor, etc.).
- 2) Spots in radio programs.
- 3) Home visits.
- 4) Meetings with the community. Objective: obtain a greater participation in the transfer activities programmed with the community in relation to bean production.
- 5) Meeting with the community to define a work plan for the training of the rural families of the zone.

If it is going well at this point, a work plan has been defined with the community. Activity number six will correspond to the first activity which has been agreed upon to be carried out with the community. For example, an agreement may arise in which each participant has to visit two more families which were not present at the meeting, in order to motivate them to participate in the training activities. On the other hand, it might be that the following action is to choose the lot where a series of demonstrations are to be executed, and so on.

The work plan will contemplate the execution of a series of training activities, which are to be carefully planned. The training activities in communication planning and technics offered by the DCA through the CTTA Project, are of great assistance in this sense, since they contribute to develop the change agent's communication abilities. In other words, they teach to "teach".

2.7.1.3 Reinforcement and Sustainment Phase

The "educational" phase of the communication strategy must be complemented by a subsequent phase of reinforcement and sustainment. Here, the radio and other mass media will play a major role.

The above does not mean that the communities attended, where a significant impact has been obtained, will be abandoned. On the contrary, due to the dynamic existing on the agricultural sector, and specifically on production systems, it is necessary to maintain an active program through which farmers will be well informed of new research results and the technology changes introduced through time are monitored. Thus, we look forward so that these communities continue benefitting efficiently from the MNR's action and give the opportunity to increase the user's coverage.

In the reinforcement and sustainment phase, a higher demand for information is emphasized rather than supply of information, since it is expected that the communities attended in this phase are highly motivated to visit the extension agencies where, besides communicating with change agents, they will be able to find posters, pamphlets, etc., which will keep them updated of recent research advances. Some families from the zone that will receive indirect attention will play an important role during this phase, since it is expected that they become "models" for their communities, and to this effect, they will have to keep themselves updated regarding technology advances.

2.8 RESPONSIBILITIES

Once activities that will follow a strategy are established, it is necessary to define those who will be responsible for the execution of each one.

In the strategy's execution, not only change agents and the community intervene, but also research personnel, special supporting units, for example the Agricultural Communication Department (DCA), and the Human Resources Office as well as institutions of the private and official sector. The multi-disciplinary team from each development agency and the community are directly responsible for the planning, execution and evaluation of the activities at the village level, and for this purpose, they will receive support from other

units as detailed further on. Note that just as the community acquires compromises, different units from the MNR are also compromised. It would not be well seen, for example, that the community complies with the program and the MNR doesn't. The contrary may also occur. That is why it is necessary to carefully plan the strategy to be used in each zone. It is not the same to work in zones where a political conflict between the members of a community exists, than that where it doesn't. All of the above emphasizes on the need for the change agent to be well acquainted with the communities with which he is working with.

To clarify this point, following are some roles and responsibilities in the execution of strategies for the transfer of technology projects.

Agricultural Communication Department (DCA)

This Department is to advise Change Agents on the selection of communication strategies to be used: train them in coordination with the Human Resources Office, in planning the communication and the use of individual, group and mass communication technics and support and multiply their job by producing agricultural radio programs and graphic and audiovisual materials. To accomplish these responsibilities, DCA's personnel needs detailed information about technologies recommended and those used by farmers; its profitability; input requirements; agrosupport (credit, marketing, etc.). It additionally requires to know farmer's characteristics --literacy; tenancy; membership in organizations; levels of knowledge; attitudes and behaviour; media use and preference, etc.-- and establish a system of farmer's feedback which can help detect the comprehension and acceptance of messages and the impact obtained with them in terms of changes in learning and use of the technology.

Research

Research personnel is to mainly look for answers to farmer's technology problems for which there is no technology offer available, and feed, based on such research results, those message contents to be disseminated by the transfer projects.

Since there are farm researchers in many development agencies, it is necessary that they coordinate their work with research program personnel located at a regional and national level.

It is expected that the research is made with farmer's active participation. Monitoring of new technologies incorporated by farmers is very important within the transfer and research activities, as pointed out before.

Human Resources

This unit is to coordinate training programs for the multidisciplinary team staff from development agencies at a national and regional level. Training for researchers and change agents must be technical as well as pedagogical.

Agrosupport Entities

This group includes, among others, those entities responsible to offer credit to farmers and to assure the marketing of their products are included. It is their responsibility to create favorable conditions so that the farmers easily adopt the technologies.

Input Distributors

The private sector, and specially those input distributors, should be co-responsible in the distribution and didactical publications to farmers and to dispose of required inputs to apply the technical recommendations by the farmers. At the same time, it is expected that they act as a feedback and feedforward channels for the generation and transfer of technology process, through the information they interchange with farmers.

2.9 CALENDAR

Each one of the activities planned in the communication strategy must be done at a determined period of time. Therefore, in front of each activity, not only the person responsible is to be noted, but also when it will be carried out. In this way, advising, followup and evaluation activities are facilitated.

Dates programmed for the performance of educational activities must take into account agricultural zone calendars. At the same time, it is recommended to consider the MNR's operation constraints when establishing dates with the communities. If they do not comply with the communities, it will cause a bad image and will limit notoriously the possibility of success in the technology transfer programs.

2.10 BUDGET

The activities programmed in the communication strategy have a cost. Part of this cost is absorbed by the community. Part of it by the Ministry of Natural Resources. It is necessary to know the budget requirements to execute a determined transfer project. Once the strategy is defined

with the community, it is required to specify the type and amount of inputs to be used, its cost; materials such as stationery, etc.; gasoline and other aspects considered important. In this way, you can count on an estimate of how much is required; e.g., inputs, well in advance, which are to be obtained once the project has been approved by regional directors. If possible, it is necessary that the community obtains the required inputs to execute some transfer activities such as the method and results demonstrations. The more the community contributes with the inputs, the more they will attend to the activities. In the zone of San Luis in Comayagua, some positive experience in this regard has been obtained. This recommendation should be implemented sooner in the areas where the activities have been carried out for some time. It would be desirable that the regional administration office offer counselling to the change agents regarding budget programming applied to transfer projects.

2.11 EVALUATION.

Evaluation is an essential component within the technology transfer project scheme. It should be guided to determine the achievement degree of the project's objectives. Specifically, by means of the evaluation it is possible to determine among other factors:

- (a) Changes in the farmer's levels of knowledge regarding technology recommendations.
- (b) Application and continued use (adoption) of the recommendations.
- (c) The associated factors of changes obtained.
- (d) The major constraints that affect the objective's accomplishments; and
- (e) The most effective communication strategy.

To evaluate the transfer projects, you can use the formative and summative evaluations. The formative evaluation is the one made during the project's execution and permits that necessary adjustments be made to meet established objectives. This type of evaluation is to be permanent. The summative evaluation is the one made in order to determine the project's impact. As you will conclude, there is a close interdependence between the formative and summative evaluations.

According to the severity, the evaluation may be classified in three categories: informal, semi-formal and formal. The informal evaluation is the less precise of the three evaluations. It is to be used permanently. The semi-formal evaluation is more refined than the informal evaluation and includes the usage of simple explorations, registers and systematic observation. The auto evaluation technic is considered to be involved in this type of evaluation. Finally, the formal evaluation, which requires the use of a scientific method. It is the most precise, but it has the inconvenience that it requires trained staff, time and resources to carry it out.

In all the transfer projects, the formative evaluation must be applied permanently. This evaluation may be done by following up those activities planned in the strategy, by means of lectures with the farmers, registers, observations, etc., in order to introduce the necessary corrections and be able to explain the resulting changes of the transfer project's execution.

In case human and financial resources are available, it is desirable to make a formal summative evaluation of the transfer projects.

2.12 APPROVAL

Once the transfer project has been elaborated, it has to be presented to the regional directorates for its review and approval. Thus, it is expected that the projects executed by the change agents count with the necessary approval to carry them out and that the regional directors have the necessary detailed information available regarding transfer projects which are being carried out in the region.

The directors and the agencies must have available copies of the approved transfer projects. The maximum time given for the review and approval of the projects by the regional directors should be agreed in due time. No transfer project should be executed without the approval at a regional level.

In summary, to elaborate a transfer project, you must begin from the results obtained from the diagnosis of the farmer's most felt needs, their actual levels of knowledge, attitudes and the use of technology regarding such problems. This information should be complemented with information regarding communication media use and preferences by farmers to receive agricultural information. Following the diagnosis and the comparison of results with the recommendations available, the transfer project objectives are formulated, with emphasis in the training of the rural family. Subsequently, messages are precised for each one of the objectives: audiences; areas; media; STRATEGY --how to

comply with objectives; executors; calendar; budget; evaluation and approval by regional directors.

Once the transfer project is approved, execution is initiated following activities planned in the strategy. During the execution process, it is necessary to use the formative evaluation to determine the changes being obtained when activities are executed. When feasible, it is recommended to carry out a formal summative evaluation in order to determine achievements in an objective way. The execution of a transfer project and the existing dynamic in the agricultural production may carry you to redefine priorities in relation to the production systems or the felt needs within each system, for which it is necessary to introduce the changes considered appropriate or to reinitiate the process for the formulation of transfer projects if it is necessary.

To conclude, I would like to call the attention of two fundamental aspects. First, the need to count on a change agent's positive attitude towards the methodology procedures work, which do not look to complicate his job, but on the contrary, facilitate it by working based on an organized scheme. Second, the need to impel the investigation on the most effective communication strategies for the transfer of technology. The social investigation is as necessary as the biophysic investigation. Only through the social investigation can effective and functional technology communication systems be designed, executed and evaluated, for the conditions in Honduras. In this field, there is a long run for the following years to come.

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