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~~PART II~~

B-13

BASIC VILLAGE EDUCATION IN GUATEMALA:  
EVALUATION OF AN EXPERIMENT IN NON-FORMAL EDUCATION  
REPORT OF FIRST YEAR'S PROGRESS

Thomas A. Rich  
Edgar G. Nesman

JULY 1974

## THE EVALUATION STAFF

During the 1973-74 project year the personnel related to the evaluation component were as follows:

- Dr. Thomas A. Rich, Project Director and Evaluation Specialist who has dedicated approximately one-fifth of his time on an overload basis.
- Dr. Edgar G. Hesman, Project Co-Director and Evaluation Specialist who dedicated approximately one-fifth of his time on an overload basis until January 1, 1974 and has since worked on a two-thirds and full-time basis.
- Miss Sandra Kellaher, as a Graduate Assistant, dedicated one-half time, starting in January.
- Mrs. Joan Sheppard, as Secretary, dedicated one-half time starting in February.

In addition to the above personnel specifically contracted by AED through the University of South Florida, the following have been part of the evaluation activities:

- Dr. Richard Anderson, University of Florida, Data Processing Specialist, working on a consultant basis.
- Mr. Robert Terzuola, Guatemala, Field Supervisor for data gathering.
- Senores, Rene Peña, José A. Cacao, Ruben D. Gonzalez, Marco A. Alonso, Jorge E. Garcia L., Hugo R. Gonzalez V., Oscar A. Mellado L., Julio C. Monroy O., Mario A. Rosales C., and José L. Monterroso M.. All of Guatemala and serving as field interviewers.
- Dr. Howard Ray, Guatemala, BVE Program Leader, as a consultant on all aspects of evaluation.
- Mr. William Bradford and Sr. Mario Dardon, Guatemala, as administrative personnel of BVE.

BASIC VILLAGE EDUCATION IN GUATEMALA:  
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## I. THE EVALUATION COMPONENT: AN OVERVIEW OF 1973-74

### A. Program Requirements

The Basic Village Education Project (BVE) is an experimental program of information and agricultural education for the rural adult in Guatemala. The objective of the experiment is to determine the effectiveness and relative costs of different mixes of communications media, used to supplement the work of extension agents (limited in number) in influencing change in agricultural practices and production among the Ladino (Spanish speaking) and Indians (Quiche speaking) of rural Guatemala.

The objective of the services to be provided by evaluation component is to measure the differential effectiveness of the series of communications treatments with respect to changes in knowledge, attitude, practice and production about agriculture on the part of the rural Guatemalan family, particularly the male farmer. The evaluation is directed toward those changes between the experimental and control areas chosen by AID and the Government of Guatemala with the assistance of the evaluation component for the BVE Project and toward changes within the experimental areas subjected to the following three different levels of treatment, each treatment area including five villages with populations of approximately 125 families:

Treatment No. 1 - Radio broadcasts alone.

Treatment No. 2 - Radio broadcasts with additional audio and visual materials and organized radio forums.

Treatment No. 3 - Same as No. 2, with the addition of extension agent services.

It is with the above objective in mind that the following activities have been carried out during the 1973-74 year. In terms of the evaluation component personnel there are two working periods, the first, beginning in July, was carried out on the basis of consultation as time permitted. The second, which began in January was within the agreements of a contract between the Academy for Educational Development and the University of South Florida. The evaluation specialists involved were the same in both cases.

### B. Basic Design of the Project

The evaluation personnel assisted in the planning and design of the overall project from its earliest stages. In the consultations of March and July of 1973, the basic experimental design was considered as a fundamental part of the project. This has continued up to the present day with the result that the evaluation component is an integral part of the total project.

### C. Preliminary Survey and Site Selection

During the 1973 summer months, the evaluation personnel assisted the field personnel in the different aspects of site selection for the first experimental area. This included a number of trips into promising areas followed by a review of the available census data on those areas. The field personnel conducted an in-depth reconnaissance survey to determine the agricultural characteristics before final selection. The Quesada Valley was chosen as the experimental area and

Yupillereque as a control.

#### D. Base-Line Survey, First Phase

During the months of September and October, 506 farmers were interviewed in the experimental and control areas mentioned above. Prior to this, a number of preparatory steps were necessary: 1) selection of the sample for interviewing; 2) developing the strategy for interviewing; 3) selection and training of the interviewers; and 4) developing the questionnaire. The questionnaire development began even prior to site selection and was based on a review of the literature related to non-formal education and agricultural practice adoption as well as many years of personal experience by the evaluation personnel. Many revisions of the questionnaire were made prior to the pre-test in the field.

The results of the survey were processed and available for analysis and field use in the last week in October. The steps in processing were as follows: 1) checking the questionnaires in the field; 2) transferring the data to key-out sheets; 3) key punching the computer cards; 4) assisting in the development of the computer program; and 5) interpretation of the computer print-out.

All of the information from the first phase of the base-line survey will be used as a starting point for the measurement of changes as a result of the educational program. In addition to the use in the future, preliminary analysis has been initiated. A summary is found in Appendix A.

#### E. Base-Line Survey, Second Phase (Agriculture)

In November, the interviewers returned to the field to do the second round of interviewing. There were 489 of the original 506 that were available for reinterviewing. Many of the same steps were followed as in the first phase: 1) the development of an interview strategy plan; 2) additional training of the interviewers; 3) questionnaire preparation; 4) questionnaire pre-test; 5) field checking of questionnaires; 6) transfer of data on sense sheets; 7) electronic preparation of computer cards; 8) development of the computer program; and 9) interpretation of the computer output after processing was finished.

This information was also made available for immediate field use as well as being retained for measurement of change. The computer output has been summarized and is found in Appendix B.

#### F. Intensive Agricultural Survey

An intensive agricultural survey was conducted at the same time as the second phase interviewing was in process. A random sample of one-in-five was selected for this survey. The evaluation personnel assisted in the different steps of the process although the major responsibility rested with the agricultural field personnel.

#### G. Time Sample Survey #1

The educational radio station was inaugurated on Saturday, March 23. On the following Monday the first round of time sample interviewing began and continued through April. Prior to this a number of steps were necessary: 1) development of the interview strategy plan; 2) development of the system for selection of the monthly sub-sample; and 3) the preparation of the questionnaire.

The usual steps were followed in processing the data: 1) field checking of the questionnaires; 2) transfer of data to sense sheets; 3) electronic punching of computer cards; 4) development of the computer program; and 5) interpretation of the computer output after processing.

The output of the first time sample has been added to the accumulated data from the base-line surveys. All surveys have been indexed so that change can be measured at the level of the individual, the village, the experimental sub-area, and the total area. The computer printout of the first time sample was available for analysis and field use in May. In addition, a summary has been prepared and is found in Appendix C.

## II. Continued Time Sampling

The same steps outlined in Time Sample #1 have been continued. The second round of time sampling was finished in May and is ready for computer processing. As of July 1, 1974, the third survey has been completed in the field and will be prepared soon for processing. The questionnaire for the fourth round has been revised in the direction of increased reliability and validity. Time sampling will continue up to October when the year-end survey will be conducted.

### I. Preparation for 1974-75

Since January 1974, considerable time has been dedicated to site selection and design review for the expanded program of 1974-75. In conjunction with this, a review of personnel and budget requirements for the evaluation component was undertaken in June. The projected work load for the next period is approximately three times that of the period just ending. The experiences from the first year will be helpful for the second year but careful planning will be necessary to coordinate all of the required activities.

### J. Educational Aspects of Evaluation

Many of the evaluation activities have had direct educational or training implications. A partial list continues: 1) field interviewers - through training sessions, field experience and explanation of the total evaluation process; 2) field supervisors - through explanation of the total process, field experience and provision of written materials; 3) project administrators - through explanation, written material and informal discussions; 4) international development personnel - through participation in international meetings and explanation to visitors in the field; 5) university colleagues - through interchange in forums at professional meetings and informal conversations; 6) graduate students - as graduate assistants on the project and in graduate seminars; 7) undergraduate students - in classes on Research Methods, Social Change, Social Psychology, Central American Societies, and Introductory Sociology as well as participation as data coders and in informal discussions; and 8) the public - through radio and newspaper coverage and invited talks.

## II. BACKGROUND

Interest in development and modernization has been stimulated by recognition of rapid population increases, food shortages, and the mounting evidence of the crippling effects of severe nutritional deficiencies on human growth and potential. The traditional subsistence economy, with mounting population pressures and concomitant low yield farm practices has become the special target of development programs through formal and nonformal education, agricultural improvement practices, and health and nutrition improvement practices.

Despite attempts to improve formal rural education and to develop adult literacy programs, the subsistence level peasant population remains largely illiterate and slow to change. Nonformal education, through mass media, such as radio, appears to be a major communication channel for reaching enough people in a time period that will make an overall impact. The present report is a description of the evaluation activities during the first year of one program designed to test this approach.

The Academy for Educational Development (1973) concluded that an experimental project in Basic Village Education is feasible in Guatemala and stressed the importance of the following factors:

- 1) The need for rural development in Guatemala.
- 2) The potential benefits of the project to rural development.
- 3) The availability of resources to develop materials and information for such educational programs.
- 4) The capacity and willingness of Guatemalan agencies in health, agriculture and education to cooperate and to provide adequate administration of the project.

The target population in Guatemala is the rural, peasant subsistence farmer, characteristic of the traditional rural societies that are still found throughout the world. Arensberg and Hiehoff (1971) describe the attributes of the rural peasant and their description is most applicable to that of the current population under study. These attributes are as follows, paraphrasing generally from the reference:

- 1) Use subsistence form of agriculture.
- 2) live in a cluster of houses, from a few hundred to a few thousand people.
- 3) Have greater self-sufficiency than farmers in industrial states but dependent on cities for special goods.
- 4) Sell some surplus production for cash.
- 5) Are ambivalent towards the city in that they need goods but have fear of exploitation.
- 6) Are bound by traditional values and custom.
- 7) Are on the average, illiterate.
- 8) Have low levels of educational attainment.
- 9) Follow regional patterns of diet, home use of remedies, and use of local practitioners.
- 10) Are not productive farmers in terms of the national economy.

This description covers the attributes found in our population and can be generalized in developing nations. These characteristics have been included in the base-line measurements made during this first year.

The population is thus defined and the program includes the use of radio plus additional interpersonal channels, as media. As Lerner (1967) indicated "This is the present challenge of communication. The media have taught people what to want, they must now teach people how to get." Lerner went on to emphasize we must teach new skills as well as values. We must make inputs and services available if we stimulate wants. Again, the present project is designed around the concept that through radio we not only can stimulate want but skills can be taught, and ways to obtain needed inputs and services made clear to the peasant farmer so that he may make his own decision about involvement and risk in the modernization process.

Rogers and Shoemaker (1971) define communication as a change in knowledge and attitudes while diffusion as overt behavior change (adoption). In the present

study, the evaluation of communication, diffusion and consequences is built into a research design. It is critical to know if changes in knowledge and attitudes are in fact reflected in overt behavior change and if this overt behavior change does, in a direct way, have measurable consequences. Each of the three time-sample surveys has included measurement of change at all three levels - knowledge, attitude, and behavior.

The most clear cut consequence in the present study would be change in agricultural yield. Yet, if we do not measure at all steps in the process, the meaning of the findings would be unclear. A change in knowledge, attitudes and adoption of new agricultural practices without actual major positive consequences for the farmer taking the risk would tell very little. The base-line data survey and re-test approach in the present study taps knowledge in a variety of areas and particularly as related to the adoption of the innovation package in part or in whole. Short term consequences would be in crop yield whereas long term consequences might well be changes in nutritional level, energy available, and cash income. Such changes may then be reflected in increased readiness to accept messages through the media of radio, increased mobility, change in formal education programs within the community and a variety of other adoptions. For this reason such things as levels of living, nutrition, mobility, communication patterns, and education have been measured in the base-line survey and will continue to be measured throughout the life of the project.

For this first project, agriculture was selected as being an aspect of life in which actual services and inputs (such as credit and fertilizer) could be made available if the radio messages were motivating enough for the peasant to seek assistance. While it is close to the heart of the peasant economy, a paradox may have been created by this selection.

- 1) It should be the most motivating area since it is close to peasant life and understood and meaningful.
- 2) It could be the least changeable since it is the most tradition bound.

The consequences of such conflicting motivations may well be investigated further during this study and assist in the interpretation of outcome. A comforting thought however, is that the modernization process has started within an aspect of life that includes almost all areas of traditional peasant living and it may be that readiness for change is now at a much higher level than it would have been ten years ago. The eagerness for new information that has been demonstrated during the first months of programming gives an indication of this readiness for change. The year-end survey will give a more exact measurement of the results.

### III. DESIGN, EVALUATION, ANALYSIS

#### A. Desired Outcomes of Evaluation

The evaluation plan deals specifically with:

- 1) Evaluation of the differential effectiveness of a series of communication treatments in producing change in attitude, knowledge, practice, and production.
- 2) Measurement of such changes in two highly different cultural settings (Oriente-ladino, Occidente-Indian).
- 3) A cost benefit analysis following the experimental aspects of development.

Measurement of change is based primarily upon degrees of significance of differences between various treatment and control areas in changes in knowledge, attitudes, practices, and production. Given the measurement of differences, together with crop yields and program cost elements, cost effectiveness will be determined and extrapolated for a larger population by an agricultural economist.

Formal analysis, evaluation and reporting can encompass only the above. Some important side benefits should also accrue, however, in terms of additional inferences that may be made, and later researched by others. These include, for example:

- 1) A time sample feed-back system throughout the experiment will provide much information concerning effectiveness of specific modes of message presentation within each of the treatments. Such information, used to guide preparation of message materials for BVE, should also be of value to communicators in other rural education programs.
- 2) Where changes in knowledge and attitudes are not accompanied by changes in practices or production, there will be opportunity to gain insights into other obstacles that inhibit or prevent change.
- 3) Although no conclusions will be possible concerning forms of organization that can best provide needed agricultural infrastructure, nor the quantitative effects of adequate vs. inadequate service availability, nevertheless some inferences on the influence of such service availability on rapidity of change may be possible.
- 4) If treatment application does result in differential rates of change, conditions will be created that will permit study (not by BVE) of the social and economic consequences of such change.

#### B. Experimental Design

The basic approach of the evaluation component follows standard experimental design. A description of this method is found in the following excerpts:

"Some types of study design provide more convincing grounds for drawing causal inferences than do others... An experimental design provides both greater certainty and greater efficiency by making possible the simultaneous gathering of various lines of evidence. In an experimental test... the investigator... would select the subjects to be assigned to different "treatments," and would in one treatment expose the subjects to the presumed causal variable and in the other treatment not expose them to it... Thus, in a single study he (the investigator) could gather evidence of three kinds needed to provide a basis for inferring a causal relationship: concomitant variation, time order, and the possible influence of other factors" (Schlitz, et al. 1960:83-90).

This particular type of experimental design is classified as the "Method of Difference" which is characterized by the use of an experimental and control group. The standard procedures for this method are as follows:

- 1) Two groups of subjects are selected by matching, by randomization, or by both and are presumed to be equal in all relevant respects except for measurable chance differences.
- 2) One group is designated the control group and the other the experimental group. The experimental group is properly exposed to the independent variable or variables, and the same is withheld from the control group.
- 3) If a change occurs in the dependent variable in the experimental group, but such a change does not occur in the control group,

then the researcher attributes the change to the independent variable he manipulated in the experimental group." (Doby, 1967:141).

### C. Research and Evaluation Design

On the following pages; the outline of the evaluation plan is shown with explanatory materials at each stage in the process. Figure 1 and the accompanying explanation reflect the nature of the target population, the selection of experimental and control groups, the establishment of base-line measures of attitude and practice, the measurement of agricultural yields, a definition of the treatments administered over time, and re-evaluation after the agricultural cycle is complete.

A feature not always found in field research is that of continuous time sampling of behavior and attitudes in the field during the course of the experiment. A field investigator has been trained to systematically contact, interview and observe behaviors and attitudes of members of the intensive subsample. This time sampling has had an impact on the nature of the message and will yield important process data in interpreting the later base-line evaluation.

#### Evaluation Plan for the Oriente

1. Site Selection (see Figure 1) - In the Department of Jutiapa, one control area and one experimental area were selected for the initiation of the project. For 1974, Quesada was selected as the experimental area and Yupiltepeque the control area. The experimental area was divided into three sub-units, each to receive a different treatment during the year. The three sub-divisions were based on a combination of geographic proximity and estimated degree of interpersonal interaction, providing for three distinct areas as separate as possible within the same general geographic area. No comparable sub-divisions were made in the control area. From the available data it was calculated that all areas have illiteracy rates of approximately 60%, radios in a ratio of 1:12 persons and generally comparable agricultural practices.

2. Base-Line First Phase Survey (see Figure 1) -

a. Sample Selection - Sample selection for intensive interviews was undertaken in both the experimental and control areas.

Experimental site - in each of the three sub-divisions of the experimental area, a sample of 125 was drawn for intensive interviewing during the months of August and September. A list of subjects by village was prepared from the available census data so that a random sample from a preselected acceptable list in each village was obtained. This random sample consists of approximately 10 to 30 subjects from each village within each sub-division. The total interviewed were 118, 133, and 113 in the three sub-area. This particular sampling gives a broad range of types of subjects, landholding and land quality. The subjects are males, controlling from .5 to 12.0 manzanas (1 manzana = 1.7 acres) of land under cultivation with intent to remain on the land for the coming year. Variables such as perceived literacy, perceived soil quality and other such critical areas were studied through correlation procedures the first year with experimental field verification of actual land suitability and literacy as time and technology permitted. A number of field visits were made both before and after site selection for this purpose.

Control site - in the control site a random sample of 125+ subjects from a broad range of villages was gathered based on the same criteria listed for the experimental site. The intensive interviewing in the

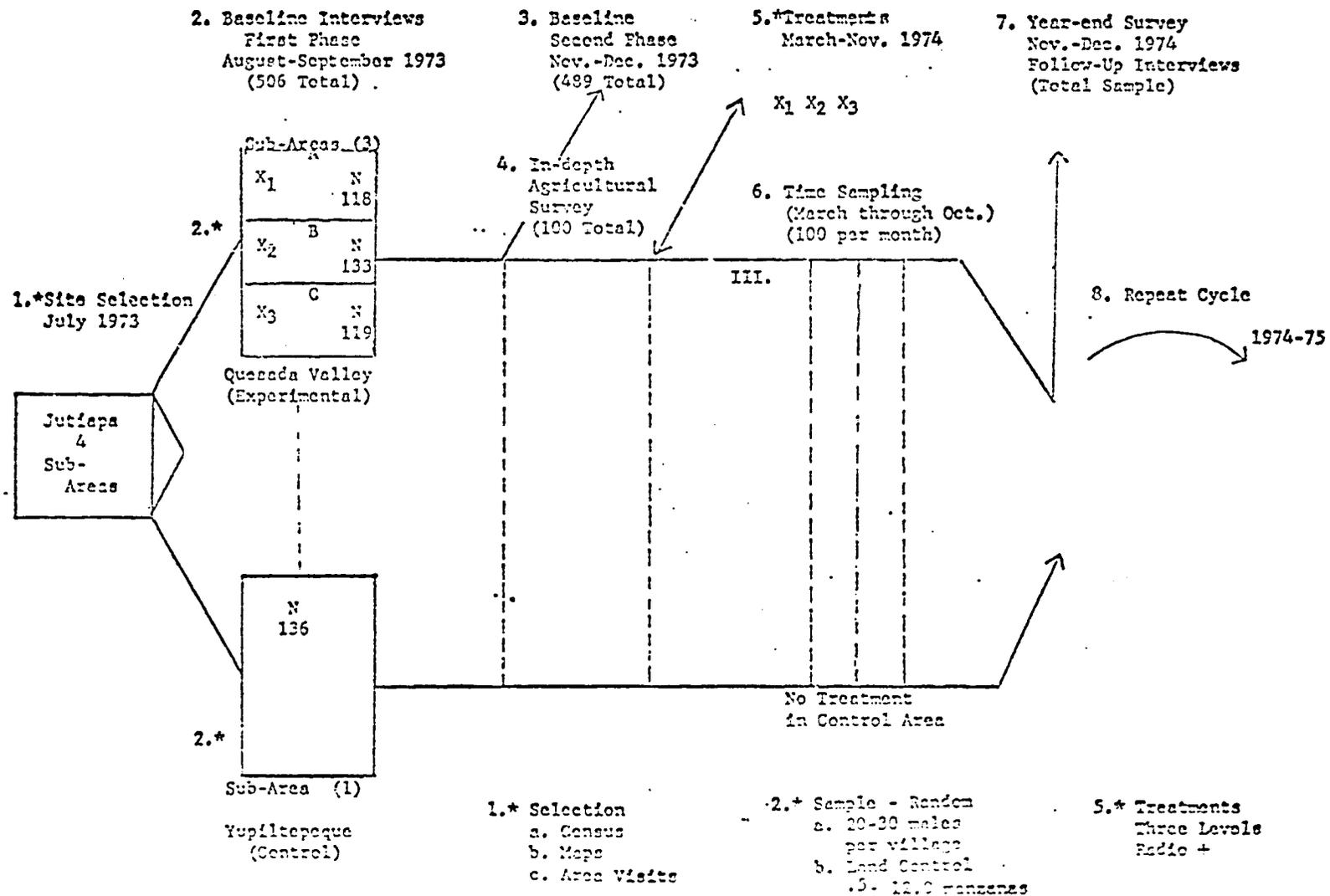


FIGURE 1 - For discussion See Progress Report 1973-74, Part III C.

control area took place in late September and October with a total of 136 interviews completed.

b. Development of the Questionnaire - A survey questionnaire is a measuring instrument and requires numerous revisions before it can be used in the field. Each questionnaire must be tailor-made to fit the specific situation in which it will be used. In this case, every possible item that might be needed as a starting point to measure later change should be included. Also every possible item that might explain the propensity of an individual to change should be considered. At the same time, the questionnaire must not be so long or threatening as to provoke negative responses. The interview had to be a pleasant experience because it was the beginning of a series of such encounters that would last over a period of three years.

The first input in building the questionnaire came from the evaluation team. The experiences of both Rich and Resman in evaluation research provided a general framework for the questions to be included. This experience also provided a procedure for getting the necessary information to develop a refined instrument for the field. Before proceeding further a visit was made to the actual experimental area to observe the physical layout, the agricultural enterprises, and the general way-of-life of the people. It was a view of the whole to see how things fit together and to see the setting in which the instrument would be used.

Early in the process, questions were provided by Dr. Ray in terms of present and possible agricultural practices. Because of the large number of agricultural items it was agreed that a few be selected for the general survey and a second round of interviewing be conducted at the end of the harvest season to get detailed agricultural information.

At the time of the fifth draft on August 2<sup>nd</sup>, 1973, the following criteria had been used in the selection and refinement of the actual questions: 1) questions related to present levels of agriculture; 2) questions related to present patterns of communication and information sources; 3) basic demographic questions that are related to adoption of new agricultural practices; 4) questions that probe present attitudes and knowledge levels in relation to agriculture, communications and change orientation; 5) only items that prior studies in agricultural communications and the diffusion of innovations have shown to be important factors in the adoption process; and 6) only questions that can be pre-coded.

At this same time, further refinements needed before the pre-test were listed: 1) eliminate all questions that can be obtained through observation; 2) eliminate all questions that can better be asked later; 3) eliminate all questions that do not get at (a) present levels of agricultural knowledge, attitudes and practices, or (b) present levels of communication attitudes, knowledge and practices, or (c) possible visible indicators of the propensity of individuals and the community to change agricultural practices through the use of radio; 4) refine the wording of the questions for better understanding; 5) simplify and clarify the coded answers; and 6) re-arrange questions in proper grouping so that there is an easy flow.

In the final stages of questionnaire development, it was reviewed by Dr. Anderson in terms of data processing and analysis. It was then circulated to all concerned for any final recommendations. At this stage, another visit to the experimental area was necessary. This time, specific observations were made as to items on the questionnaire. A visit was made to one of the schools and the sure items were discussed

with the teacher. A brief visit was made in a number of homes also. The main purpose of this trip was to get a "feel" for the specific situation in which the developed questionnaire was to be used. At the same time, all possible care was taken not to contaminate the area.

The questionnaire is actually only one part of the total measuring instrument. The other part is the interviewer that uses it. The final revision before pretest was made by the ones who were going to administer it in the field. Role playing was used to test the questionnaire at this point. Each question was then reviewed as to its intent and how to select the proper pre-coded answer. Many changes in wording, order, and coded answers were made at this point.

A place was selected for pretest that was as similar to the experimental area as possible. Two days were dedicated to pretest in which each of the eight interviewers conducted as many interviews as possible. All of the interviewers met together with the evaluation team for two days after the pretest to make suggestions for changes before the final questionnaire was duplicated for the field.

c. Selection and Training of the Interviewers - In a report submitted by Mr. Robert Terzuola, supervisor of field interviewing, on October 3, 1973, the following items are mentioned:

"Selection of Interviewers - After a review of the communities and areas to be surveyed in the base-line investigation, it was decided to select and train a total of eight field interviewers with one extra to replace any that might drop out during the training program.

Bio-data sheets were received from ten men in all, five already engaged by the Project and five new recruits.

The bio-data sheets were reviewed and the men individually interviewed before a final decision was made as to who would be selected.

Interviewer Selection Criteria -

1) Bio-data sheet: Interviewers were selected on the basis of experience in similar interview roles, experience in rural works, education (a minimum of high-school equivalent was required) willingness to work for periods of time in the rural areas and the ability to do so in terms of personal problems, physical disabilities, etc.

2) Interview: During the interview, trainees were selected on the basis of their attitudes towards rural areas and people, comportment in a pressure situation, speaking abilities and comprehension of the task involved in the baseline survey.

Training of Interviewers - The training program consisted of laboratory and field experiences which were designed to accomplish three basic objectives:

1) To form a cohesive, functional group which could explore and solve its own problems.

To achieve this goal certain games and exercises were used which forced the trainees to depend upon one another to solve problems presented to them.

2) To form and develop interview techniques in the interviewers. Group discussions and written instruments were used to help define and develop good interview techniques during the training exercise. After considerable discussion and lecture, the interviewers began a series of role playing exercises in which they experienced the role of interviewer as well as interviewee. This technique was used extensively throughout the training program coupled with group discussions which helped to focus in on individual problems during the role playing.

3) To develop into a useable instrument the questionnaire and polish it."

After the group had experienced the group-building exercises and problems, role playing was used to help Dr. Hessian focus in on specific problems contained in the format of the questionnaire.

As the interviewers developed their techniques, they also helped to identify certain areas of the questionnaire which needed polishing in terms of order of questions, wording, coding of answers, etc.

After a full day of this type of exercise, the questionnaire was pre-tested in Sta. Rosa de Lima by the interviewers who, at the same time had a chance to practice in a real situation, that which they had learned in the training session.

The following day, the questionnaire was altered based on the suggestions of the interviewers drawing from their experience in Sta. Rosa.

During the entire process of selection and training, no major problem was encountered. The interviewers were all enthusiastic about the program and anxious to get out into the field. The group as a whole appeared to be, if not homogeneous, quite well integrated and adjusted to itself and the task at hand."

As an introduction to the questionnaire a brief explanation by members of the evaluation team covered the following points: the nature of the project, the nature of the evaluation component, the research design, the reasons for the base-line survey, the items to be measured (present agricultural practices, present communication patterns, indicators of the tendency to change, etc.), the steps in preparing the questionnaire to date, and their part in further refinements.

d. Field Interviewing Procedures - A summary of field experiences was prepared by Terzuola in September 1973 to cover the actual interviewing. This report is included in the following paragraphs:

General - Eight Guatemalan interviewers were employed in the Cuesada and Yupiltepeque Valleys during the weeks of September 10, 17 and 24. The interviewers were supported by the field supervisor and the field agronomist using two vehicles for local transportation.

A total of 370 interviews were conducted in 15 communities of the Cuesada Valley and 136 interviews in the Yupiltepeque Valley during this time.

The Sample - The field supervisor was supplied with a list, taken from 1973 census data, of local farmers who fit the requirements (according to the census) of interviewers in terms of land holdings, crops, family status, sex, etc. The names of these farmers had been randomized and a given number plus substitutes to compensate for attrition comprised the master list for each community.

Interview Procedures - Wherever possible, the interview was conducted in the home of the interviewer. Due to the dispersed nature of many of the communities and our lack of experience with them, it was decided to use, where possible, the local school as a base of operations and to rely on the teacher and students to indicate whether or not the farmers were available to be interviewed and to act as guides for the interviewers.

After determining which of the farmers were available and working substitutes for those who could not be interviewed, the list was divided among the interviewers who, with a student guide, sought out the farmers.

During the course of the day, as the interviewers reported in to the supervisor, names were checked off as completed, pending or unavailable and substitutions made as indicated.

In the evening, the questionnaires were coded by the interviewers and turned over to the supervisor who counter checked the master list indicating that the person had been interviewed and the questionnaire received, and also entered the receipt of each questionnaire on a control.

sheet which indicated the name of the interviewer, number of interviews conducted that day, the number of each one and the name of the community.

The counter checked master list was deposited in the envelope which held the completed questionnaires which in turn were stored for deposit in the office at the end of the week.

Sample Attrition - A relatively high percentage of the randomized sample appeared to be unavailable for interviewing. The largest single contributing factor was absence due to work on the South Coast for a variety of reasons mainly planting of beans there and exchange of cattle and other livestock.

The second largest contributing factor to sample attrition was the fact that many of the randomized names were those of women who owned but did not work the land.

Other contributing factors were: visits to the capital or cabecera departamental, illness, non-existence of person perhaps due to a totally confused name from census data and drunkenness.

In all cases substitutions were made as indicated."

e. Data Processing - The steps followed in data processing have been summarized in this form:

- 1) The questionnaire for the field survey was pre-coded in Guatemala and shipped immediately after interviewing and careful checking to the evaluation unit in Tampa for transfer to coding sheets.
- 2) The coded data was delivered to Anderson in Gainesville for computer analysis. These programs were designed to provide intensive data analysis for immediate feed-back to the field team and program staff.
- 3) All computer output was presented in triplicate so that one copy was available each for Anderson, Hesman and Rich and for field use in Guatemala.
- 4) Upon completion of the data processing the printouts were reviewed by Anderson, Rich and Hesman for further interpretations and in preparation for further summary and analysis.
- 5) The computer programs included the following: a) tabulation of all the variables (questions 7-130); b) frequency distributions for the total area; for the four sub-areas; for each of the twenty villages; and for each of the interviewers; an overall correlation matrix of 100 X 100; a multiple correlation matrix for a number of variables related to corn yields; and a sub-set comparison of sub-areas on thirteen selected variables.
- 6) All notations on the original questionnaires were summarized and sent back to the field for use in programming.

f. Analysis and Interpretation of the Data - The field interviewing was finished in the last weeks of September. The precoded questionnaires had been sent to Tampa as soon as a sub-area was finished. A group of four to six coders were at work constantly so that the coded layout sheets were in turn transferred to Gainesville for key punching as soon as the sub-area was finished. Consequently, all 506 cases were ready for computer processing on October 16, 1973. Anderson, Rich and Hesman met to review the computer output on October 24 and a copy was carried to Guatemala on October 26 for field use.

In addition to the computer output, summary tables have been prepared that include the frequency distributions and item correlations (see Appendix A). Rough drafts of a narrative summary, a farmer profile, and grouped summaries (i.e. educational characteristics, etc.) have been started but due to lack of time are not in final form. An attempt has been made also

to develop a "level of innovativeness" score for each of the farmers by scaling a number of the items on the questionnaire. These additional levels of analysis will be continued as time permits.

### 3. Base-Line, Second Phase (Agricultural) Survey (See Figure 1) -

The subjects that were interviewed in the first phase were again contacted on an individual basis in November and December. The first part of the interview was dedicated to follow-up questions on agricultural practices that were not included in the first phase due to space limitations. The second major aspect of the interviewing was to obtain accurate and reliable data on major crop yields that would serve as the baseline for comparison with crop yields as the program progressed.

a. Preparation of the questionnaire - The same procedures were followed in the development of the second phase questionnaire as in the first. The questions were divided in six major categories: 1) cultivation practices; 2) yields; 3) marketing; 4) technical assistance; 5) crops grown in other areas; and 6) miscellaneous. All of the questions had pre-coded answers and sufficient space for observations.

A pre-test was conducted in the same location as before. The interviewers assisted in the final preparation of the questionnaire before pre-test and again helped in the revision after the test.

The following information was placed on the questionnaires before going to the field: 1) the case numbers and the corresponding names of the respondents as taken from the first phase questionnaires; 2) the corresponding villages and sub-areas; and 3) the person who had done the first interview.

b. Field Interviewing Procedures - The same interviewers were used in the agricultural survey as in the first phase of the base-line study. No additional training was necessary although one session was dedicated to a complete review of the results of the first survey. All of the data processing steps were demonstrated including: checking the questionnaires for consistency and accuracy, transfer of the data to layout sheets, key punching of the computer cards, computer processing, and the computer print-out. The field copy of the print-out was examined by the interviewers with a great deal of interest and they could easily see the results of their field work in the frequency distributions and the correlations. They were particularly impressed with the need for accuracy in every step of the process.

Once in the field, the following guide-lines were used: 1) only those interviewed in the previous survey were interviewed; 2) every attempt was made to interview all names on the panel list, many repeat visits were made in order to do this; 3) Yupiltepeque was interviewed first due to early migration of the workers, this was followed by Guesada A, B, and C in order; 4) a different interview procedure was followed, interviewing was done in a central location, all of the subjects were notified in advance about the time and place for their interview, and all subjects were compensated for the time involved; 5) wherever possible, the subjects were interviewed by the same interviewer as in the previous survey; 6) additional coded categories were included in every question so that the "0" (no answer) category was used only if there was a refusal; 7) each question was marked immediately with the proper coded answer and additional comments were written in. Care was taken so that the interviews not be hurried although the usual duration was approximately one-half hour in length; 8) immediately after each interview, the interviewer

checked the questionnaire for proper coded answers and made any further written observations before going on to another person; and 9) the field supervisor checked the completed questionnaires before leaving the community so that any questions could be clarified.

A field report by Terzuola and dated October 15, 1973 gives further details of the procedures:

"In order to facilitate the agricultural survey in November, it was decided to prepare the sample in advance and to pay each interviewer the sum of 75¢ for the time he would lose from his work.

The key informants in each area, José Guillén in Yupiltepeque and Gregorio Soto in Quesada were contacted on these days to solicit their help in advising each farmer of the date and location of the interviewer in each village since the surveys will not be conducted at the home as in September but will instead be conducted in the school or municipality of the village.

Each farmer will be contacted by the key informants or his helper and will receive a chit worth 75¢ for which he will sign or make his work on a master control list. Upon being interviewed, he will turn this chit over to the field supervisor who will then pay him the 75¢ in cash.

The system was thoroughly explained to each of the key informants who were also supplied with the necessary materials for the job.

Contact of the interviewers will be made no more than one week in advance of the date of the interview to avoid confusion in dates and days.

The chits will be prepared in the office with the name of each interviewer and the date of his interview clearly printed on it."

A report of the actual interviewing procedure was prepared by Ray, dated November 6, 1973 and reads as follows:

"Following the system worked out by Terzuola, the agronomist in the area had arranged for interviewees from Aspitia and Pueblo Viejo to be at the Municipalidad in Yupiltepeque for interviewing. The group from Pueblo Viejo were present at the time we arrived, so interviewing could begin almost immediately. The group from Aspitia arrived before completion of the Pueblo Viejo group, so interviewing continued without interruption throughout the morning.

The system of interviewing in a central place which had been adopted for the agricultural survey, appeared to work much more smoothly than I had anticipated. Each interviewer was given a questionnaire, made contact with the person he was to interview, and found a secluded spot for the interview - in the shade of a building, on the steps of a nearby building, etc. Using such a dispersion technic, it was possible to conduct the interviews without other people listening in. The interviewers reported that in this informal setting, the respondents offered information freely, and they felt the results were as good as when the interviews had been conducted at the homes.

The absentees were few in number. Only one or two interviewees per village did not show up. At least one person had left for the coast, and will be gone for about a month. An interviewer was to go to each of the villages to seek out the other absentees."

The interviewers did a reasonably good job from the outset with the questionnaire administered to the entire sample. However, a review of each questionnaire by myself or Bradford immediately upon completion of the interview invariably revealed a few errors or omissions which could then be taken care of on the spot. Bradford and I made a list of items relating to the questionnaire that he would discuss with the entire group of interviewers that evening. In spite of all the work done on the questionnaire before final reproduction, the first morning of interviewing did reveal a few problems.

In general we were pleased with the results of the first few interviews. Also, the interviewers appeared to appreciate the fact that we were checking each of their questionnaires carefully and calling problems to their attention. Overall, I was well pleased with the manner in which the survey got underway. The first community Pueblo Viejo was completed in less than three hours without rushing.

There were 489 of the original panel of 506 that were interviewed. Every effort was made to contact all missing cases and many return visits were made. The 17 missing cases either had moved or no longer met the fundamental characteristics necessary to be part of the sample.

c. Data Processing - The questionnaire for the agricultural survey was prepared in a way that observations could be recorded as well as the pre-coded answers. For this reason the original questionnaires were retained in Guatemala for use in later educational programming. The pre-coded answers were transferred to electronic sense sheets for data processing. These were then sent to Tampa for further checking and transfer to computer cards. Anderson then met with Rich and Hesman to go over the computer program that would give the desired analysis of the data.

d. Analysis and Interpretation of the Data - The computer output was replicated so that one copy was immediately available for the field as well as one for Anderson in Gainesville and Hesman and Rich in Tampa. The output included the following types of analysis: 1) frequency distributions of all variables by sub-area and village; 2) an overall correlation matrix; 3) a standard read-out of means, modes, standard deviations and tests of significance for all items, and 4) a comparison of the missing cases to the larger sample.

In addition to the computer output, a summary report has been prepared for field use (see Appendix B). Additional analysis and interpretation is contemplated as time permits.

#### 4. Base-Line, In-Depth Agricultural Survey (see Figure 1) -

There was an early realization that effective educational programming for agricultural development would require a complete knowledge of present practices. The available information from the census and the other previous projects gave some help and discussions with government agricultural workers also added to the information base. Also, during the period of site selection a great deal of time was spent in gathering first hand information through reconnaissance surveys. In the preparation of the first questionnaire it was soon realized that the kind of information needed for programming was much more detailed than could be included in a pre-coded instrument. It was agreed that a special questionnaire was necessary and that it should be administered by agricultural technicians rather than regular interviewers. It was also agreed that it should be administered to a sub-sample rather than the whole panel.

a. Preparation of the Questionnaire - The task of preparing this questionnaire was done almost completely by the agricultural personnel related to the project. The evaluation component gave some advice as to such things as the ordering of questions but little more. The final questionnaire contained a list of a possible 1185 items of which only those relating to the enterprises of the particular farmer being interviewed were used.

The questionnaire was subjected to the same refining process and pre-testing as were the other two used for base-line information gathering.

b. Selection and Preparation of the Interviewers - The two agricultural technicians related to the project served as interviewers. Both had participated in the development of all of the questionnaires to date. They had also participated in the interviewer training sessions as well as having had experience interviewing farmers before. They conducted the pre-test, and the discussions that followed gave further opportunity for relating the questionnaire and interview techniques.

c. Sample Selection and Field Interviewing - A random selection by village was chosen for the in-depth agricultural survey. A total of 100 respondents was selected from the total panel. This number was divided evenly among the sub-areas so that there were twenty-five from each one.

The interviewing was done at the same time as the regular agricultural survey (base-line, second phase). The regular questionnaires were marked so that those chosen for the in-depth survey were asked to go to the agronomist for further interviewing. The interviews were all conducted in a central location and the farmers were being compensated for their time so there were no problems. In a field report by Ray dated November 11, 1973 the following observations are made:

"The second part of the questionnaire appeared to be less troublesome than I had anticipated. Both Pena and Monterroso completed two of the intensive interviews while I was there. Pena completed one such interview in about 45 minutes, while Monterroso required approximately 1 hour and 15 minutes per intensive interview. Both reported that the questionnaire was workable. After reviewing the first few, I had only a few questions to raise with them."

d. Analysis and Interpretation of Data - These questions were open-ended or check-off type for the most part. No computer processing was contemplated until a later date if necessary. The material has been summarized for use on the field as needed.

As a test of representativeness, the sub-sample that was interviewed in-depth was also selected for special tabulation on the regular agricultural survey. Preliminary review of the data indicate that the sub-sample is representative of the larger panel. Further analysis and interpretation is required as time permits.

## 5. Treatments (see Figure 1) -

Beginning in March 1974, the treatments were applied to the three experimental sub-areas. The basic treatment was a radio station located in the experimental area and at the site of the regional school near the village of Quesada. The nature and extent of the three treatments was dependent upon the plan developed by the field team in conjunction with an agricultural communications specialist. The treatments included varying degrees of intensity of messages provided by increased use of audio-visual materials and by personal contact by agricultural specialists. The three treatments are: 1) radio alone; 2) radio plus local monitor and limited audio visual material; and 3) radio, monitors with visual materials, and agricultural technicians.

During the same period that the three levels of treatment are being applied in the experimental area, no treatment will be applied in the control area. It is expected that related services such as credit will be available both in the control and experimental areas so that change will not be restricted by the lack of service inputs. The agricultural message content will be related to the cropping cycle and continue in the experimental area throughout the year.

## 6. Time Sampling -

The time sample surveys were designed to serve a number of purposes. First, it is a method of getting over-all feedback on the effects of the experimental treatments. This should not be confused with the process evaluation that the educational program component is also using. The process evaluation seeks to determine the effect of the different audio-visuals that are used, the listeners reaction to the radio broadcasts and to find out how the components can be improved for greater impact. The time sampling results are of interest to the programmers also but it is in terms of overall treatment impact and comparison rather than for program improvement.

The second major purpose of the time sample is to give a measure of change as the treatments are applied. The base-line surveys indicated the starting point, the time samples give check-point views along the way as to how and where change is taking place. These check-points are measured at the level of the individual, the village, and the treatment areas. The changes that have been observed in the monthly time samples should also be reflected in the year-end survey.

There were a number of guide-lines that were developed for time sampling. On November 6, 1973 the general plan was outlined as follows:

- 1) Five people will be interviewed in each community in all four sub-areas each month. These people will be selected from the base-line sample on a rotating basis.
- 2) One full-time "field visitor" will be required for the above purpose. Working under the general supervision of Terzuola, this field interviewer will spend one day per month in each community. Thus his work load will be five "time-sample" interviews per day.
- 3) The conversation method of interviewing will be used, but specific answers will be sought to a limited number of questions.
- 4) The number of questions to be asked at any one interview will be limited in number, and related to the specific message of the season.
- 5) Questions and "indicators" will be built on the basis of educational objectives for each educational unit (planning, credit, agricultural practice, etc.).
- 6) Since the interviews will be conducted in the communities, and a given individual will be interviewed no more than about three times in a year, the interviewees will receive no compensation.
- 7) Time sampling evaluation will be handled separately from program feedback. (Program feedback needed for immediate use in message development will be handled through the system of agricultural technician, paid monitors and volunteer reporters.)
- 8) Time sampling will be initiated in February 1974, assuming that programming begins in January.
- 9) Ray will send message calendar for 1972 and outline of message content for January through March 1974 to Hesman in Tampa as soon as possible.
- 10) Hesman will develop the detailed framework for conducting time sample interviews, and a series of guide questions based on material to be supplied by Ray.

As the date for the first round of time sampling approached, the guidelines and procedures were refined. During the last two weeks of March 1974, Hesman and Terzuola worked out the following plan:

- 1) Will start in Yupiltepec on Monday, March 25.
- 2) The first round of time sampling will be related to the crop planning

messages prepared for use in late March.

- 3) Selection of the sample. All of the people who have taken part in the first two surveys and for whom we have given case numbers have been placed on maps by house location. Each of the communities has been divided into five zones according to physical location. For the larger communities there will be five or six houses per cluster, and in the smaller communities three or four. Once the zones have been established, the numbers of all of those falling in that zone are listed in terms of accessibility from a central location. A random number was chosen and this was used as the starting point in the list within each one of the zones. In case this person is not at home, then the next person on the list will be interviewed. The following person will be interviewed in each successive month until a complete cycle is finished. Those that are not found at home one month will be the first in the interviewing for the next month. In the smaller communities each person will be interviewed more often than in the larger communities.
- 4) The interviews will be conducted in a conversational style and the interview schedule not be filled out during the interview.
- 5) The results of the interview will be recorded on a standard questionnaire directly after the interview. They will be checked at the end of each day and checked again with the supervisor at the end of the week.
- 6) The questionnaires will be translated to sense sheets for transmission to Florida at the end of the time sampling period after all of the villages have been completed. A photo copy of the questionnaire will also be included in shipment to Florida.
- 7) The questionnaires will be brief, trying to maintain approximately ten questions on each round of interviewing.
- 8) Special care will be taken during the time sampling interviewing so that contamination will be kept at a minimum in terms of the educational messages and radio broadcasting.
- 9) The questions included in the time sampling interviewing will be directly related to learning objectives. The learning objectives will be stated in terms of specific recommendations included in the educational program prepared for the radio broadcasts, the group meetings, and the agronomist's visits.
- 10) The learning objectives will be sent to Florida on or by the 10th of each month so that the questionnaire can be prepared. These learning objectives will be stated in terms of specific recommendations for behavior change that are part of the programming. Also, the objectives will be listed by priority, realizing that all the objectives cannot be measured and that only a few will be selected for the time sampling questionnaire.
- 11) Data Processing. Simple tabulations will be made of the total monthly sample and of each of the sub-areas. At a later date further comparative analysis will be made if it is useful and necessary.
- 12) The field interviewing will be done by Astolfo Mellado who has taken part in all of the interviewing up to this point. He has been given special training and will cover one community per day, one sub-area per week and each month cover all of the twenty communities in the total experimental area. At the end of each week he will turn in the finished questionnaires for the five communities of the sub-area. All of the questionnaires from the four sub-areas of the experimental area (Oriente I) will be checked as they are coded for data processing. Any observations that are of use for educational programming will be summarized at this time also.
- 13) These procedures will be examined during, and at the end of the first round of time sampling to see if any modifications are necessary.
- 14) Mr. Robert Terruola will supervise all aspects of the time-sampling.

The first round of time-sampling was finished on schedule. The data was transferred to electronic sense sheets in Guatemala, checked and converted to computer cards in Tampa and sent to Anderson in Gainesville for processing. The computer output was replicated as in the former surveys so that copies would be available for consultation in all three locations. In addition to the computer print-out a summary of the data was prepared for field use (see Appendix C).

An attempt was made to convert the coded answers to a "level of change" score for each individual. This has worked very well and the result is a score for each individual as well as an average score for each treatment area. As can be expected, the three treatment areas all show more change than the control area.

After the completion of the second time sample (May 1974) some modifications were made in the original plans. The questionnaire was redesigned so that change in the directions of the ideal practice could be measured as well as the source of new information bringing about the change. Also each change was measured in terms of information, attitudes, and behavior. One standard question concerning the amount of corn planted will be used on all time sample questions.

A change was also made in the interviewing technique. Due to problems of reliability and validity, it was agreed that the questionnaire should be filled out at the time of the interview and that specific questions be asked rather than a completely conversational style.

#### IV. PLANS FOR 1974-75

##### A. Oriente I Experimental Area. Year-end Survey.

At the end of the crop cycle in November of 1974 a refined version of the initial questionnaire will be readministered, along with collection of crop-yield data. The analysis will concentrate on differences within the three treatment areas to determine: first, if there is a measurable difference in effectiveness, and second, to determine the extent of this effectiveness to later be related to cost/benefit analysis. The three sub-areas will be individually and collectively compared with the new information obtained for the control group as the base for making statements about change.

In addition to the standard experimental comparisons made between treatment and non-treatment groups, samples will be studied to determine the nature and characteristics of those people who respond most to the treatment or who changed most in the control condition. High change subjects will be compared with low change subjects and studied on the wide range of demographic, agricultural and social variables. In addition to looking at experimental and control groups it should be possible to identify target populations within groups of illiterates with differing responsiveness to mass media.

Since there will be increasingly complex sets of variables as subjects are studied across the total sample it may be necessary to utilize more complex multi-variate analysis of the data to insure that maximum information has been gained from the study.

Other aggregate data such as overall reports of fertilizer sales, grain sales, and credit provided will also be considered for measuring overall changes.

##### B. Continuation and Replication of Experimental Design

Because of the nature of agricultural communications and rural adoption patterns it is important that the program started in the Quesada area (Oriente 1) continue another year and beyond if possible. The longitudinal measurement of change over time depends on this continuation. For this reason the treatments will be continued as will the Time Sample surveys and the year-end survey in November of 1975.

The findings from research and evaluation are only applicable in situations similar to those in which the study was carried out. The plans for the second year include a replication and extension of the experimental design to other areas including one with a vastly different culture, that of the Indian highlands. The following design has been proposed for 1974-75 and has been approved subject to slight modifications:

- 1) Quesada will remain as an experimental area with three treatment sub-areas. A year-end survey will be conducted in November that will cover all of the respondents. Time sampling will continue with a 1 in 5 sample for eight months.
- 2) Yupiltepeque will be expanded into a full experimental area by adding 250 respondents and dividing into three treatment sub-areas. The power of the radio station of Quesada will be increased so that it will reach here also. A year-end survey will be conducted among those 125 respondents that were part of the control area of 1973/74. A base-line survey will be conducted among those selected as the additional 250 to complete the sample size of an experimental area. Time sampling will be conducted in the same way as in the Quesada area.
- 3) Ipala (or other area selected in Oriente) will be initiated as a control area. A sample of 125 respondents will be selected for the base-line survey. These same respondents will be part of the time sample surveys conducted in Quesada and Yupiltepeque. An additional 125 respondents are being considered as an additional group for a non-radio, cassette forum treatment. If this experimental group is added it will also be included in the base-line survey and the monthly time sampling.
- 4) The Occidente will be initiated as a full experimental area with three treatments sub-areas and a control sub-area. A total of 500 respondents will be chosen for the base-line survey and they will also be interviewed in the time sampling interviews throughout the year. This design contemplates the establishment of a new radio station that will reach all except the control sub-area.
- 5) The plans for 1974/75 contemplate the combination of the two base-line surveys (general and agricultural) in one interview. The basic questions used in 1973/74 will be included. A panel of judges and an analysis of the responses in the 1973/74 survey will both be used in the refinement of the questionnaire.
- 6) Standard data processing procedures will be continued in 1974/75. One copy of the computer output will be available for field use. A summary tabulation of the responses in codebook form will also be prepared for field use. This will be accompanied by notations of significant variance between sub-areas on each item and correlation between items when appropriate.

#### C. Data Gathering Requirements for 1974/75

The following list gives a comparative view of the data gathering requirements of 1973/74 and 1974/75:

	1973/74	1974/75
1. Number of subjects		
Quesada	(ABC) 375+	(ABC) 375
Yupi	(CON) 125+	(ABC) 375
Ipala	--	(A + CON) 250
Occidente	--	(ABC + CON) 500
TOTAL	506	1500
2. Number of sub-areas		
Quesada	3	3
Yupi	1	3
Ipala	--	2
Occidente	--	4
TOTAL	4	12
3. Number of villages		
Quesada	15	15
Yupi	5	15
Ipala	--	10
Occidente	--	20
TOTAL	20	60
4. Base-line interviews		
Quesada	375+	
Yupi	125+	250
Ipala	--	250
Occidente	--	500
TOTAL	506	1000
5. Time sample interviews		
Quesada	(75 X 7) 525	(75 X 8) 600
Yupi	(25 X 7) 175	(75 X 8) 600
Ipala	--	(50 X 8) 400
Occidente	--	(100 X 8) 800
TOTAL	700	2400
6. Year-end interviews		
Quesada	--	375
Yupi	--	125
Ipala	--	--
Occidente	--	--
TOTAL	--	500

#### D. Personnel For Evaluation Component 1974/75

The 1974/75 research design is based on the following work arrangements:

##### At University of South Florida, Tampa

- 1) Rich (Director) will dedicate one-fifth of his time to the project during the academic year (October to June) and two months during the summer.
- 2) Nesman (Co-Director) will dedicate one-third time during fall quarter and two-thirds time during the remainder of the year.
- 3) A full-time research assistant will work for 12 months.
- 4) Two graduate assistants will work one-half time during the academic year.
- 5) A secretary will work two-thirds time for 12 months.

On Separate Contract

- 6) Continued assistance from Terzuola as field supervisor in Oriente.
- 7) A field supervisor for Occidente.
- 8) Personnel and transportation for interviewing furnished by the field office.
- 9) Continued assistance from Anderson for data processing.
- 10) Continued advice from field office administrative staff.

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