

BIBLIOGRAPHIC INPUT SHEET

Batch 84

1. SUBJECT CLASSIFICATION	A. PRIMARY Food production and nutrition	AE50-0000-G360
	B. SECONDARY Rural sociology--Nicaragua	<i>PN-AAF-591</i>

2. TITLE AND SUBTITLE
Income and employment planning in the rural sector; study of rural welfare, final report

3. AUTHOR(S)
Pattie, P.S.

4. DOCUMENT DATE 1978	5. NUMBER OF PAGES <i>56p. 57p.</i>	6. ARC NUMBER ARC
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7. REFERENCE ORGANIZATION NAME AND ADDRESS
Nathan

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)

9. ABSTRACT

Discusses the step-by-step progress in the development of a methodology for gathering information on income and employment of rural families in Nicaragua through a moderately low cost survey. Emphasis was placed on seeking other kinds of indicators of welfare in addition to employment and income and collecting and tabulating information in a way that it would have direct implications for current program implementation. These interests account for the somewhat new methodological approaches created for use in the survey: use of a community survey preceding the family survey, and the use of two questionnaires in the family survey. One family survey deals with income and employment and the other addresses use of income and time outside of work-related activities, including rural families' participation in public services. Questionnaire A is titled "Income Generation and Employment". Topics explored include: general characteristics; education and health; structures and equipment; land tenure; crop production; livestock production; non-agricultural production; employment; occupational experience; use of time: days per year; credit, technical assistance, and marketing; and participation in formal organizations. Questionnaire B is titled "Use of Income, Public Services, Well Being". Topics covered include: general characteristics; education; health; nutrition; housing and possessions; household expenditures; use of time: house per day; production and employment; credit, technical assistance, and marketing; values and attitudes about well being.

10. CONTROL NUMBER <i>PN-AAF-591</i>	11. PRICE OF DOCUMENT
12. DESCRIPTORS Data acquisition Employment Income Methodology Nicaragua	13. PROJECT NUMBER
	14. CONTRACT NUMBER AID-524-76-064-T
	15. TYPE OF DOCUMENT

361-97285

Contract 524-76-0041 R

NATHAN
PN-AAF-591

FINAL REPORT TO AID/NICARAGUA

ON

INCOME AND EMPLOYMENT PLANNING IN THE RURAL SECTOR-

STUDY OF RURAL WELFARE

BY

Preston S. Pattie
Project Director/Consultant
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February 7, 1978.

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FINAL REPORT TO AID/NICARAGUA ON

Income and Employment Planning in the Rural Sector-- Study of Rural Welfare

Preston S. Pattie
Robert R. Nathan Associates, Inc.



February 7, 1978

INTRODUCTION

This project was first funded for 14 months by a grant from AID/Nicaragua, providing technical assistance to DIPSA, Ministry of Agriculture, and then by an additional 4 month contract directly with the MAG to continue this assistance. The project has as its purpose the development of a methodology for gathering information on income and employment of rural families through a moderately low cost survey. Early in the development of this survey, emphasis was placed by DIPSA on: 1) seeking other kinds of indicators of welfare in addition to employment and income, and 2) collecting and tabulating information in a way that it will have direct implications for current program implementation. Throughout the development of the survey, up to the present time, these interests have been expressed more and more sharply, accounting for the somewhat new methodological approaches created for use in this survey. In particular, the new approaches being referred to are 1) use of a community survey preceding the family survey, and 2) use of two questionnaires in the family survey, one dealing with income and employment, and the other addressing use of income and use of time outside of work-related activities. The second questionnaire also emphasizes rural families' participation in, and benefits and costs connected with, public services.

Project Team and Institutional Environment

DIPSA formed a group of five very capable people to carry the major responsibility for the project. Ing. J. A. Mejía was head of the project. He and Ing. Ernesto Valdivia, worked as counterparts with myself as advisor to the team. Work on the project was initiated the very day of my arrival, and, in general, good use was made of the time of these people, and myself. Administrative support varied from very good to very bad, depending on varying priorities set by DIPSA.

DIPSA is a planning unit of the Ministry, and for that reason faces a more turbulent external environment than other kinds of research institutions. This instability causes resource use to be more than what it would otherwise be for a longer term, continuous program of this kind. Especially, elapsed time increases considerably; and this causes complications when making use of outside consultants is a factor. The internal environment of DIPSA was highly centralized, with most communication between divisions within DIPSA being highly formalized and sometimes sluggish. This began to change in the last few months. Still, communication from persons in DIPSA to other agencies of the government nearly always go through the central administration, causing isolation of the Nivel de Vida team from other public programs that relate to it. It was especially made clear early in the project, that DIPSA felt that contacts made by the Nivel de Vida group should be made by members other than the consultant. The result is that few contacts were established other than through the Director of DIPSA.

The lack of cues from the political system weakens the usefulness of studies such as this. Decisions to place emphasis on one aspect or another of rural life are made as a function of the interests of the investigators, rather than potential users. The positive aspect of this study, was that the investigators kept in contact with the population under study through continual field visits, and through two phases of the study. This results in a survey oriented toward what rural people express is of concern to them. But realistically, a planning office in the Latin American environment cannot seriously define this population as the clientele for the information produced. First the information will never reach most of these people, and second, this population cannot give the political support necessary to justify the allocation of funds to this activity. The only way to make the study useful is to orient the survey towards the interests and needs of users, which are persons in higher positions of public, autonomous, and some private institutions.

Elapsed Time and Activities

As will be explained fully in later parts of this report, this study was elaborated into a series of steps, which culminate in the analysis of a family survey. During the period of the contract, starting in September 1976, the steps leading up to this analysis were completed as follows:

Start up	1 month
Preparation and field work on community survey	4 months

Tabulation and analysis of community survey	3 months
Publication of results and seminar over first phase of work	3 months
Preparation of family survey	7 months
<hr/> TOTAL	<hr/> 18 months

A personal feeling of myself is that the elapsed time on many of these steps was somewhat longer than necessary. A variety of factors influenced DIPSAs to take decisions that extended the time period to what it is. Especially important among these factors was a desire to do a fairly complete analysis and prepare a complete document and formal seminar at the end of the community survey. A second aspect affecting the family survey has been difficulties of scheduling field work due to political disturbances in the study area.

BACKGROUND

Three essential factors stood in the way of directly embarking on a family survey:

1. Lack of prior knowledge about various social and economic factors of rural families that would permit designing a reliable questionnaire
2. Lack of a sample frame, free from critical biases, and in workable condition to sample families in the field
3. The decision on the part of Jaime Fernández and J. A. Mejía to use the community as a unit of analysis in order to use survey results for orientation and evaluation of public programs.

All three factors were major obstacles, but the last one has especially far reaching implications. It implies that most existing information about rural families aggregated to the municipal level is not specific enough for the purposes defined. And we discovered that the census, nor any other institution, could disaggregate to the community level reliably.

Level of Prior Knowledge

Public agencies in Nicaragua are either oriented toward urban services or toward production. Rural people receive little attention as such. Previous surveys done by UNASEC and DIPSA have been oriented toward certain enterprises, or toward farm units, usually of a commercial nature. Experience of people on our team with rural families in Region V was initially very limited. The great series of questions that need to be addressed for designing a questionnaire and survey methodology just could not be answered. For instance, the researcher needs prior knowledge on such things as:

- cropping patterns among peasant families
- land tenure arrangements
- units of measure of land (does the farmer accurately estimate land area?)
- units of measure of product (can the farmer give conversions to standard measures?)

- common selling arrangements and prices
- seasonality of activities (are there problems with interviewing at certain times of the year?)
- temporary migrations
- special arrangements between families and large land owners involving labor, housing, care of livestock, use of land and capital assets, etc.
- nature of government services
- means of transport
- use of purchased inputs, credit
- ownership of animals, production, use of products in home
- non-agricultural activities (how many families do not depend on farming?)
- employment patterns (do members employed off the farm still participate in family production activities?)
- role of women and other family members in providing labor, and in making decisions in production, marketing and consumption
- openness to interview (which family members must be present? what questions are delicate? what special problems will arise?)
- how well do people mentally record past events on different subjects, and in what form? do people understand averages or percentages?
- what time period of reference is best on different subjects, and what seasonal variations exist?
- how long of interview time will people accept?
- what ties exist among families?

And, of course, there are dozens of other questions that arise as one works on an individual subject. A great deal of initial preparation time and field testing was needed to overcome this problem. Though we began on this early, the variation throughout the study region made the requirements fairly large.

Further, we faced a special problem that some team members did not at first recognize their need to improve their own knowledge about rural families. The initial thinking was that a rural family is the same as a commercial farm, only smaller. But after making several visits to the field and conducting a series of very preliminary interviews, the value of being in constant contact with the people in the region before beginning the survey became clear.

The Community as a Unit of Analysis

Even though the information sought relates basically to the family, there is considerable interest expressed in the community as a unit of analysis. I believe the reasons that motivate Jaime Fernández and others in this direction is that the community both defines the environment in which rural families are situated, and it often becomes the level at which rural services are provided. Reaching rural people requires identification of target groups. This means not only knowing how many families are in different socio-economic strata, but also how they are geographically distributed. The "address" of a rural family in an LDC is the community residence. Knowing the condition of the community as a whole helps identify the kinds of programs that can help different groups in the community, e.g., target groups.

For instance, the question of which farmers receive INVIERNO production credit and technical assistance has been a three step decision in Nicaragua:

1. Which of the eight regions should receive top priority?
2. Which communities should INVIERNO work in?
3. What qualification standards should be used to select families?

Though it was scarcely conceived by plan, the community became an essential part in the formation of INVIERNO's working strategy, and conveniently so, because working with rural people through community groups can lower operating costs considerably.

The community also holds a critical role in the evaluation of public programs that try to reach rural people. Success and failure of most public programs in rural areas of LDCs varies with the place -- in one community an idea catches on and obtains results, while in another the same program fails because of social or other constraints particular to that place. And prediction of these results can be useful for planning purposes. Since communities vary with respect to several critical factors, such as land tenure, soils, climate, or access to off-farm work, stratification of communities can help insure greater marginal impact of public programs.

Lack of a Sample Frame

For methodological purposes, the clinching obstacle to initiating a family survey directly was the lack of a suitable sample frame of families. The only possibility was a sample frame that is available from census which covers about 40% of the study region. The census divides municipalities into segments similar to census tracts

in the USA. About 40% of the segments in the study region were chosen for review and updating of the 1971 census material. This work has occurred from 1973 to the present. However, the census segments do not correspond to community boundaries, nor to any other phenomenon of interest to us. So using this sample frame would mean abandoning the concept of community and working only with the family unit.

Further, there were questions raised as to how one would physically locate families in the field after having them selected from a list and located on a census map. Field trails quickly led us to conclude that this is no small problem. Reference points are few, and some part of the rural population are quite mobile, changing residence as work (or land tenure) conditions change. It was felt that using this sample frame would probably require visiting each segment selected to become familiar with reference points and boundaries and to make revisions due to recent changes. This suggests use of a well-experienced team since even locating the segment in many cases is a time consuming task.

Alternative Strategies

A position paper was sent to Jaime Fernández on November 5, 1976 describing our progress and presenting two alternative methods of proceeding. The choices for the study seemed to be: a) visit a large number of communities as a preparatory measure and to establish a sample frame of families, and then proceed with a family survey, or b) try to overcome the obstacles by frequent field visits to insure workability of the census sample frame and the questionnaire, sacrificing any analysis at the community level.

The reasons that analysis of the community is impossible by sampling families is of special importance. In rural Nicaragua, community structure is usually weak in the sense of formal organization. Only a few people are highly involved in community matters. These people are from the more stable families which might own land or other small businesses. Other parts of the population, such as families living on large farms, or those that migrate frequently in search of work, or those that share crop, are often not incorporated into the community social structure. Many of these families are not aware of community boundaries or even of the name of the community they live in. For instance, census asks for the name of the locality of the residence. But the interpretation of the meaning of locality varies greatly. Some families give what they believe is the "official" answer, which is the comarca (which, in itself, has never had defined boundaries); others will name the closest fincas which identifies the part of the valley they live in; and many give names which are confused with similar names that actually refer to other places. There can be

many San José's or Las Lajas in a single municipality and even in a single census segment. While one San José may refer to an entire community, another may refer to only a reference point, such as a group of houses, within a community of a different name. A third San José could refer to a large farm in a community of a different name. In effect, every response given by a single family would have to be checked against the consensus of the community leaders, which are the only people knowledgeable about the community boundaries.

Though the community is an essential level for designing programs, directing them, and making them operational, no Nicaraguan institution develops information at this level in a systematic fashion. Many institutions, such as PLAN SAR, and the Ministry of Education, work in places that they recognize as communities. But they seldom make efforts to define the outer limits of the community to identify what is included and what is excluded. Instead, they usually work with a selected group of families in each place, without knowing what portion of families they are reaching. Others such as INVIERNO work in only certain places, and place efforts on only certain strata--family farmers with land.

METHODOLOGY: COMMUNITY SURVEY

It appeared that alternative a), involving a visit to each community would cause an increase in elapsed time for the study, and resource expenditure and budgetary costs would increase. But with virtually no documentation of experience from other studies, it was hard to estimate how much these increases might be. Our feeling was that community visits would require about three to five months work total, and that this process might trim two to three months off of preparation time for the family survey. The loss in time was potentially zero, and could go up to three months. But it was also felt that there would be a considerable gain in usefulness and even accuracy in information obtained from the entire study.

The decision was made to conduct the community visits, but that the number of communities should be realistic to control costs. The information sought would deal with community size and make-up, services, physical access, and other general aspects.

It soon became apparent that a short visit to interview community leaders would involve considerable travel time (about 1 or 1 1/2 hours each way to and from each community) compared with effective working time. Therefore, conducting a more complete interview that would give a solid base for preparation of the family survey would add little to costs, and would be more effective preparation for the family survey.

Community Sampling Procedures

For the reasons stated previously, obtaining an accurate and complete list of communities turned out to be impossible. We relied mainly on the census, because they had the most complete listing, and because relying too heavily on other institutions would have introduced biases toward places served by them. This was especially important with respect to INVIERNO since, at the time, the AGROMOCs were among the few people closely connected with broad groups of rural people.

The complete list from census contains over three thousand "rural places", but many of them have only one dwelling, and about 70% have 10 or less. Naturally, this is a result of not defining communities.

Previous analysis by Ing. Mejía had revealed that for a place to have a service such as a school, community water, or a health center, the minimum

number of homes is about 25. This minimum cut point seemed to identify the places that people that live or work in rural areas are familiar with. Other names on the census list refer mostly to reference points within these communities. Using this listing as a starting point, we made modifications with the help of INVIERNO and other institutions, slowly piecing together a list which we consider fairly complete and free of biases.

Secondary information allowed stratification of communities according to type of access road, distance to nearest municipal center (town), existence of technical assistance for production (from any office), and other services in general. With a large sample, stratification is not essential. And secondary information turned out to be so unreliable for everything except physical access, that I doubt that the strata improved the sample by very much. However, stratifying did help identify the kinds of variables thought to be of most importance for the study.

The sample size was not based on careful statistical evaluation. We did not know what kinds of variations to expect within or among communities. (This was part of the reason for spending the effort on this first phase of work.) The first reaction of people in DIPSA was that all communities in the region should be visited. Though such a large number is not necessary for the purposes of this study, such information would be helpful to persons responsible for currently operating programs. It would be difficult to determine an accurate minimum size of this kind of study, especially since it has two purposes: 1) to gather information on communities as units of analysis, and 2) to establish a sample frame of families for the family survey.^{1/} Probably the latter purpose is more demanding, requiring, perhaps, over 100 communities to insure a well-dispersed sample of families from within these communities visited in the first phase of work. But since the costs of the first phase turn out to be so low, compared with the quantity and quality of information obtained, it seems advisable to include more in the sample.

The final sample had 150 randomly selected communities of which 180 places were finally located in the field during survey work. Of these, interviews were

^{1/} Only families in communities visited form the sample frame for the family survey

not done in two cases where the communities were completely depopulated due to migrations. (No families were remaining in one and only three in another.) Ten cases turned out to be haciendas which are coterminous with their communities. We found the questionnaire inadequate for the haciendas, so the partly completed questionnaires were not used. The result was 168 completed questionnaires in communities other than haciendas. Of these 14 were rejected because, a) seven communities turned out to be located in department outside the study region, b) responses were poor in six cases, and c) one questionnaire was misplaced or lost in the field.

Thus, 154 questionnaires entered the final tabulation. A check of the sample was done using survey results by comparing region and department populations against the 1971 census (projected to 1977). Also the geographical dispersion was checked to insure good representation across all 21 municipalities, in places with and without roads, and in places that have or do not have various key services. The results were encouraging, which should be expected from such a large sample.

The results also include a listing of large farms and groups of houses as reference points in the communities. Comparing these with the census' list of rural places leads to the conclusion that about 90% of the rural population is represented in the sample frame of communities with 25 homes or more. However, the sample that resulted from this frame had 22 communities of 154 that actually had less than 25 homes. That is, these places should not have been in the frame in the first place. They were, however, left in the tabulations and analysis and formed part of the sample frame of families in phase II.

Interview Technique

The central question we faced was choosing the best respondents for the kind of information we sought. Field tests and experience of others on the team had shown that women and young people are not shy about participating and are the best informants on certain subjects. We first believed that two or three group interviews would be needed in each community to obtain representation from a cross section of the population. After the first field trial using two simultaneous interviews in different places in each of three communities, we found that responses were similar in nearly all cases. Where differences occurred, it was accounted for by the interviewer, or there was a lack of knowledge on the part of one of the groups interviewed. Some interviews were uniformly better than others, and there were ones in which the most involved and informed people of the community were present.

Because of this experience, we concluded that one group interview in each community is the best technique. Using two or more seems to spread respondents too thin and less group interaction takes place. It is group interaction that keeps any one member from becoming too dominant, not allowing others to express opinions. In groups that were well composed, people were helpful, and not at all afraid to correct each other when they felt the question had been misinterpreted by another member of the group. We found that to stimulate discussion, the interviewer would state that everyone, including women and younger people, were invited to participate. Also the seating arrangement was always carefully set so that no one was left standing, and the interviewer can establish easy eye contact with everyone present.

The groups were formed spontaneously; no previous notice was given before arriving to do the interviewing. One would usually have to ask directions in 3 to 6 places before finding the community. And upon arriving, one continues asking for directions to the houses of community leaders. These are easily identified by community members, and are nearly always eager to help once the nature of the study is explained.

We request of the leader that he identify a few people (no more than 10), including some women and some younger people, as well as older persons, that he feels would give us some of their time. DIPSA jeeps were used to transport people around the community when necessary (and possible) to form a group. Average time from arriving in the community to having a group together for the interview was only 47 minutes. Control of interviewees revealed that 10 people were present on the average, representing 9 families. And a mix of ages and sexes was obtained for virtually every interview. Interview time averaged less than 1 1/2 hours with a standard deviation of 24 minutes.

It should be noted that we were in the field the very last few days of January and the first days of February. During this period, rural people in Region V are in a slack season, and they can take time for this kind of activity.

The interview was conducted in a low key fashion. Questions were stated in general terms, familiar to rural residents. No response was recorded until the entire group reached agreement. Usually, questions were repeated once or twice while discussion was developing around the concepts contained in the question. Interviewers were not allowed to go outside the wording on the questionnaire until he had repeated the question at least once. After that, he could offer additional explanations or respond to questions directed toward him. However, as interviewers gained experience in one community and carried it to another, they adopted this

rule to fit the situation, especially in the few places where wording on the questionnaire needed improvement.

We found that people were interested in the subject and were stimulated by the group experience. This enthusiasm permitted the interviewers and supervisors, making field work all that much more effective. Interviewers needed only a minimum of knowledge of group dynamics. Since subject matter was of a substantive nature (how many families possess ovens, what portion of worker find employment outside the community, etc.) agreement was reached fairly quickly, once the concepts became clear. Clarification of concepts was, very often, done by the interviewees, themselves. One would even receive extra explanations to clarify apparent inconsistencies in responses, even before one had discovered the inconsistency.

Interviewers were encouraged to take extensive notes in the margins (which gave ample space). In many cases, additional notes were made resulting from discussions between the supervisor and the interviewer. These would stem from things that were mentioned in the interview but that had not gotten into the questionnaire.

Interviewers were, for the most part, under little time pressure, averaging only 1.25 interviews per day. When possible, we tried to have two persons on hand for each interview. The second person, the supervisor or sometimes another enumerator, would take notes, catch errors, and occasionally enter the discussion.

The field team was composed of 3 coordinators, 3 supervisors, 12 enumerators, and 6 drivers. Four days were spent in training and field work required 10 days. Because of geographical isolation of the three departments from each other, the team was split into three equal teams, one for each department.

Enumerators were contracted from the Agricultural School (university level), and averaged about 22 years of age. They each conducted one actual field interview during training, beside practice interviews at the training site near Matagalpa.

Instrument and Tabulation

The questionnaire contained 31 pages and 63 questions (some with several parts). Its six chapters were:

- I Spatial definition of the community
- II Infrastructure and services
- III Employment in the community
- IV Land tenure and agricultural production
- V Migration and employment outside the community
- VI Organization of the community

The first chapter was the most critical, because it focused the discussion on the community. In a few cases, initial responses to this portion gave a false impression because some interviewees were referring to the entire comarca, rather than to just their community. This was especially common with the jueces de mesta because they have jurisdictional responsibilities in the entire comarca. (in fact that is the way the comarca is defined.) It is critical that these errors be caught before finishing chapter I, because the rest of the interview depends on a common orientation established at the outset.

Only questions 1 and 3 refer to neighboring communities in the comarca. The remainder of the interview deals only with the families that live in the community. Questions 4, 5 and 6 give the size of the community in terms of number of families and a breakdown by type of location. Subtracting the quantities given in number 4 and number 5 from the total given in number 6 estimates the number of families residing in the central part of the community. This is hard to ask for directly because the center may be hard to define. Many communities are widely dispersed; some are linear in fashion.

The enumerator must keep this total and breakdown in mind for the remainder of the interview. The total of responses to questions on employment: number 17 the last column of the table in numbers 18, 19, 20, 22, 23 and 52 should make sense with the total number of families.

The strategy in questions 19-23 is of special importance. Most rural people consider themselves agriculturalists of one kind or another. Yet a large number also work for pay. Our procedure was to start with the specific, which was those that have steady jobs for pay in agriculture (number 19). Then number 20 asked for those that work only as day laborers, inferring that they do not work their own crops or livestock. This includes a large part of those that live on large farms. Number 21 was an additional question that gave unreliable results, so can be skipped. Number 22 asks for those who are small farmers, even though they may sometimes work off the farm. Number 23 is an additional check on number 19. This strategy of separating those that only work for pay before asking for number of small farmers seems to have been quite effective. Also the two step check in number 22 that asks for number of farmers was found to be necessary.

Another major check was the number of farmers with the source of land. Owned land in number 34 plus land received free in number 40, plus sharecroppers in number 42 and renters in number 43 had to equal or surpass number of farmers. Variations can arise when respondents include older sons (perhaps married) living with their parents as farmers, but do not count them as families receiving free land in number

40. So some latitude for interpretation must be allowed in checks such as this. Still, since we were after an overall view of the community, detail on particular family situations is not required.

Key punching the data required only four days, with verification. Total number of cards was under 2,000. Two bottlenecks developed in processing which caused delays in getting the information onto tape. One was complications in the final review of questionnaires in the office. Or rather this was a result of supervisors participating closely in field work (by design) and not able to take enough time with review of questionnaires before leaving the field. Another was the inclusion of additional pieces of "data" that resulted from evaluation of questionnaires and had tabulations of some information. That is, communities were categorized according to predominant land tenure patterns, services, cropping patterns, and other variables. These categories were punched and included in the tabulations.

Distribution of Results of Community Survey

When tabulations were received, initial output tables were redesigned to better reflect the kinds of information obtained. Our feeling was that distribution of results before the family survey would be useful to DIPSA and to the survey team, especially if interest was stimulated in other institutions. For this purpose, we organized a two day seminar with other public agencies that deal with rural areas. A 47 page publication was carefully prepared along with other materials for presentation, including colored maps and graphs.

This effort took much more time than we realized, stretching from early May until mid July. Attendance was good at both days of the seminar, and some amount of inter-agency dialogue was started on this subject as a result. However, among the seminar participants, there was such a small amount of field experience, that we received little guidance or help for phase II, the family survey.

METHODOLOGY: FAMILY SURVEY

The basic unit of analysis for the study is the family. Inclusion of the community permits analysis of families in the different community environments where they live and work. And it also makes possible analysis of the environment, itself. The interdependencies among factors in the community can be separately explored, for example, effects of local organization on services provided to the community.

The family is studied, rather than the individual, because it is recognized that most productive efforts of rural people in LDCs is performed as family members working in a team. Family labor is a fixed cost to the firm, and the use of this labor is subject to decisions made by the head of the household. Individual earnings do not depend on marginal productivity, but instead are determined by the needs and desires of the family head(s) when assigning earnings to different uses.

The basic kind of information of concern is income and employment data. This reflects the continued emphasis on program evaluation and program design, especially with respect to INVIERNO, but also for other public services. However, well-being is seen as having many sides--health, nutrition, education, housing security, and even activities for amusement or participation in communal organizations. Naturally, one study cannot gather every possible kind of information. Unfortunately, cues that would serve to guide the study toward the most relevant issues are very infrequent in the Nicaraguan institutional environment. Instead, investigators are left to choose what they think is important to study. As a consequence, there has been a struggle to balance the survey with information from many economic and social sides of the lives of rural families, but without sacrificing any detail about income and manpower utilization. The result is two separate questionnaires, with two separate samples of families. One questionnaire deals with the economics of resource utilization, production and income, and other deals with use of income and time, public services, housing, health and attitudes about rural living conditions.

An extensive literature review was completed during early phases of work. Knowledge gathered from the community survey simplified and streamlined design of the questionnaires.

Sampling of Families in Two Stages

An extra effort was made to insure that sampling procedures both "in the office" and in the field would result in a sample of the size and distribution to provide the best information possible for the money invested. RRNA/Washington produced a 35 page report for DIPSA (In Spanish and English) to set out the two stage procedure which

was employed. The reader should refer to that document for the statistical basis for sample size and distribution.

The sample frame established in the community survey, consists of 14,424 families located in 154 communities and 10 haciendas. This sample frame was found in the community survey to very well represent the population which contains around 40,000 families in perhaps around 700 rural places.

The sample size was carefully calculated after considerable effort to identify meaningful targets for statistical significance of results. This refers mainly to questionnaire A, from which quantitative measures of income, production, and resource utilization were expected. The results of this effort is a sample of 333 for questionnaire A which measures levels of economic activity and income, and 167 for questionnaire B which is more qualitative in nature. Adding 10 percent to this for attrition results in 550 families to be selected. Naturally, if a random number is chosen for every family separately, most of the 154 communities and 10 haciendas in the sample frame would have to be visited. Only one or two families would be interviewed in many of these places, making travel costs and supervision problems rise. Clustering reduces the dispersion of the sample, and simplifies field logistics. To reduce costs, a cluster should contain a number of families that a team can work conveniently in a day. Interestingly, vehicle capacity seems to dominate this issue. In our case, each enumerator will handle two interviews per day, and three interviewers plus one supervisor can be accommodated in one jeep. Thus, a convenient cluster size for this survey is six. Since this gives the required dispersion of the sample, it was decided to use 92 clusters of 6 families each, resulting 552 families to be selected.

First Stage

The first stage of sampling determines the number of families to be interviewed in each community. Thus, in effect, the first stage is a selection of communities. However, more than one cluster may fall in any community. And because of clustering, the sample of families is not distributed throughout all 164 places in the sample frame. One cluster in a community means that six families need to be selected there in the second stage of sampling. Two clusters means twelve families, etc.

Very useful and specific stratification procedures were made possible by the community survey. Two concepts were used in stratification of communities for the first stage of sampling. These are climatic situation and land tenure. But more specifically, presence of great amounts of coffee in a municipality was used to classify all communities in the municipality as being in the humid portion of the region. And a broader concept of access to land, rather than just ownership, was used to classify

communities by type:

- I Communities where most small farmers own some land and there are also large farms
- II Communities where most small farmers own land, but there are no large farms
- III Communities where most small farmers are sharecroppers or renters
- V Communities where there are more day laborers than small farmers, including the 10 haciendas.

Dividing each category by climatic zone (in the coffee portion of the dry portion of the region) obtains eight strata. Community populations in each strata were listed, and cumulated. A random number (smaller than the total of families in the strata) was drawn for each cluster. Since communities were listed in the strata by department, e.g., first Matagalpa, then Jinotega and Estelí, it was hypothesized that systematizing would improve the sample. Systematizing would uniformly spread the sample over families throughout the listing, using a set interval between random number. Several checks were made using employment and other data in phase I. It was found that in certain strata, there were marked tendencies in some variables to decrease or increase with the position of the community in the strata. This is especially important in strata where only a few clusters (perhaps under 12) are to be chosen. Thus systematizing was employed in strata where it was seen to improve the sample. In strata where systematizing was not necessary, a simple random sample was drawn. This had the advantage of selecting fewer communities or concentrating the sample slightly more, because random numbers did not have uniform intervals between them, as with systemization.

Second Stage

The community study also provided a stratified sample frame in each community. This frame gives the total number of houses in the community, and breaks them down by type of location: in the central place, in fincas, isolated, or in separate clusters identified by a different name. Systematization was used to choose houses in order to take advantage of the stratification of the sample. That is, the houses were first listed out by type of location, and cumulative numbers were assigned to each. As with systematized selection of clusters, a random start is drawn, and an interval is calculated corresponding to the desired number of houses. The interval is added to

the random start until going full circle back to the random start.

The critical part is in the field. Accurate maps of communities are not available, and few of the reference points, such as fincas, house clusters, or even community centers are indicated on municipal maps. Our procedure is to ask for the locations of these places upon arriving in the community. For instance, if we need to find house number 11 in a finca owned by Enrique Oliú (an actual case) then we find the center of the finca and begin counting with the house following the owner's house. In this case, we counted three houses in the center of the finca, and continued about 2 kilometers up a mountain road past coffee plantings before we came to houses 4 through 14, counting as we went along. We stopped at house number 11 for the interview.

This method seems to assure that supervisors will not choose houses according to ease of access or because they like the environment of one better than another. It does not insure a complete enumeration of every existing house in the community. We have to depend on the informants of the community survey for the sample frame, but the results of that survey seem quite reliable. Many of the families in finca Enrique Oliú are transient, yet the informants of the study, 6 months before had told us there were 15 families in the finca. We found 14. Our experience was similar in other places.

Another problem is finding people at home. This can affect selection of houses, because families in different occupations have different probabilities of being found at home. Especially, families having stores, and ranch foremen are very likely to be found close to the house. When the head of the household is not home, we ask for the type of work of the head. Then we continue to the next house of the same kind. Thus when we look for house number 1 in finca El Carmen but found no one home we do not continue to the next house in finca El Carmen, because house number 1 in this case was that of the ranch foreman. We continue to the ranch foreman in the next finca in the same community. If there is none, we do not try to replace the case.

Additionally, if the supervisor locates a house, say number 8, but finds it is an extension of the family in the previous house counted as number 7, he assigns them the same number (number 7), and proceeds to the next house, "the real" number 8. Otherwise, the family with a dwelling divided in two buildings has a double chance of being selected, one for number 7 and one for number 8.

Overall Sampling Strategy

Some summarization and evaluation is in order at this point on the complete sampling scheme used for both phases of the study. The table below covers salient details. It can be read down, or across. Arrows indicate how one phase or stage of sampling prepares the frame for the next stage.

OVERALL SAMPLING PROCEDURE FOR COMMUNITIES AND FAMILIES COMBINED

	PHASE I Community Survey	PHASE II Family Survey	
		First Stage	Second Stage
UNIT	Community	Cluster of six families	Family
FRAME	426 communities of 25 homes or more	17,424 families in 154 communities studied, plus 10 haciendas visited	Total of families in each of 60 communities and 10 haciendas
SAMPLE	60 communities and 10 haciendas	92 clusters in 60 communities and 3 haciendas	552 families in 92 clusters
PROBABILITY OF SELECTION ON A SINGLE PICK ^{1/}	$\frac{1}{426}$ *	$\frac{\text{Total families in corresponding community}}{14,424}$ *	$\frac{1}{\text{Total families in corresponding community}}$
RESULTING PROBABILITY OF SELECTING A SINGLE FAMILY	$= \frac{(154 + 10)}{426} *$	$= \frac{552}{14,424}$	
	$= .01473$		
	$= 1.473\%$		

^{1/} With pick of one community, one cluster and one family. Note the population of families of the particular community cancels out leaving an equal probability for all families, irregardless of the community

It is important to recognize that choosing clusters in the first stage of family selection is similar to choosing communities using the population (of families) of each community as a weight. Cluster selection determines from which communities families will be chosen and how many families will be chosen from each, e.g., number of clusters that fall in a particular community times six families per cluster. This weighting of communities according to size can only be used once in the sampling scheme. If it had been used previously in selection of communities for the community survey, a strong bias would occur in favor of families in larger communities.

To give an example, suppose community A has population P_a and community B, has population P_b . The probability of selection of a family in A (for selection of a single community, a single cluster, and a single family, for convenience) is:

Community Survey	Family Survey			Product
	First Stage	Second Stage		
$\frac{P_a}{\text{Total Population}}$	*	$\frac{P_a}{\text{Population of communities selected in community survey}}$	*	$\frac{1}{P_a}$
			=	$\frac{P_a}{\text{Total pop. times that of communities in community survey}}$

And that of a family in community B would be the same with P_b replacing P_a in the final formula above. Since the two total populations in the denominator are the same in the two cases, only the numerator causes changes in the probability of selection. If A is a community twice the size of B, the size of P_a will cause families in A to have twice the probability of entering the sample. But it can be seen that weighting communities the same when selecting for the community survey (as was done in this study) eliminates this problem, and leaves all families with the same probability of being selected, as can be seen on the preceding page.

Instruments and Tabulations

The two instruments employed with families are intended to compliment each other in several ways. Whereas a concept, such as employment, has determined dimensions in a sophisticated market economy, in LDCs a series of facets need further definition:

- manpower capacity
- utilization
- productivity
- incentives
- costs

Capacity implies information on health, nutrition, work experience, and education. Utilization implies detail on time and effort expended on different activities, coupled with productivity in each. Incentives means assignment of earnings to family members, use of earnings in consumption activities, and aspirations for use of additional income. Costs include travel, clothing, housing, search for employment insecurity, etc.

Initially, an attempt was made to reduce the size of a single questionnaire which incorporated all of the above relating to manpower, income and general well being. Use of a single questionnaire would have been preferable had we been able to reduce the interview to less than 2 1/2 hours, which is the limit of many rural families' willingness or ability to attend an interview. But the information sacrifice in many areas became a serious consideration with this reduced interview.

The result is two questionnaires, each requiring about two hours. Only one will be used with a single family. Both contain portions which relate to the other. For instance, instrument A contains a brief section on education and health, and B contains a brief portion on production and income. The contents of each are outlined here:

Questionnaire A, Income General and Employment

- General Characteristics
- Education and Health
- Structures and Equipment
- Land Tenure
- Crop Production
- Livestock Production
- Non-agricultural Production
- Employment
- Occupational Experience
- Use of Time: Days per Year:
- Credit, Technical Assistance, and Marketing
- Other Income and Transfers
- Participation in Formal Organizations

Questionnaire B, Use of Income, Public Services, Well Being

- General Characteristics
- Education
- Health
- Nutrition
- Housing and Possessions
- Household Expenditures
- Use of Time: Hours per Day
- Production and Employment
- Credit, Technical Assistance, and Marketing
- Values and Attitudes about Well Being

Instrument A will cover 4 families out of every cluster of 6, resulting in a sample of 333, and questionnaire B will cover 2 of 6, of 167 out of the total sample of 500.

Tabulation methods were set up for both questionnaires in similar fashions, as if Instrument B was a direct continuation of Instrument A, or vice versa. Programs of inconsistencies were developed by first identifying the most frequent kinds of errors expected in enumeration and keypunching, and then identifying the easiest way of making a mechanical check for the inconsistency. Programs were largely written and tried before starting field work.

The following summaries of each chapter include the rationale for the structure of the chapter, and notes on the critical points in tabulation. It is assumed that the reader has access to copies of each questionnaire to follow the detail of explanation here. It should be noted that summary tables are not a part of this report, but guidelines on tabulation included here lead to development of these tables.

Questionnaire A: Income General and Employment

General Characteristics

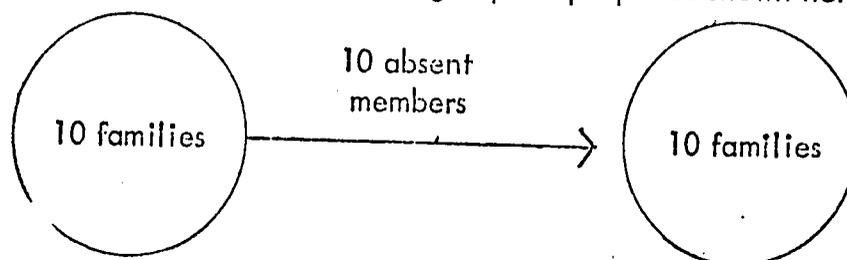
This chapter contains several sub-parts: identification of the family, of family members, interdependencies with other families, short family history, and migration history of family members and of the family as a unit.

The family is defined on the basis of residence, place where people slept for at least 6 months of the last 12 months. Everyone in the household is included,

though they may not be related. That is, all persons contributing to the economic or social framework of the household, through their labor or property, are included. And those depending on the household for residence or food, or other care, are included when this is not a result of direct contractual relationship with clearly defined limits.

For instance, if on a large farm, a cook lives in the same dwelling with the farm administrator's family, it must be determined if the cook depends on the family, or contributes to the family in any way that would change the family's well being or behavior. If the cook provides a contractual service for the farm owner, and receives a dwelling and a wage in return, the household services performed for the administrator's family could be considered a fringe benefit provided by the farm owner to the administrator. In this case, the cook could be a separate family unit or an absent member of another family.

A simplified illustration will help clarify the rule we have chosen to use in this study. Suppose there are three groups of people as shown here:



When families in the above environment are interviewed, the 10 on the left could report 10 absent members, but the 10 on the right could report these same people as family members. This would result in an overcounting of people. There seem to be three alternative approaches:

1. Ignore these people on both sides and define them as separate family units.
2. Arbitrarily assign them to one side or the other at the outset.
3. At the beginning of each interview, make a determination as to contribution and/or dependence, and assign each to one side or the other.

Alternative 1 is inconvenient when the sample frame and selection procedure is based on dwellings. Since both families carry only 1 chance of selection

choosing either one of them would cut the chances of selection in half, resulting in biases away from families that share dwellings. This implies that both families be interviewed separately, on two questionnaires, which is nearly the same as including both on the same form.

Alternative 2 has the disadvantage of distortions due to regional imbalances. If only families from inside the study area have absentee members, and the choice is made to exclude them from the survey, then these people are not picked up in the families that they live with, because these families are outside the study area.

Alternative 3 requires judgement on the part of enumerators and supervisors, and allows no way to check exactly to see if the right balance was struck to avoid overcounting or undercounting of people. But the same can be said of alternatives 1 and 2. Alternative 3 is the one chosen for this study.

The family head is defined by respondents. Where two spouses head the family, the male is automatically considered the head, in accordance with tradition in rural Nicaragua.

Nuclei are defined within the family according to marriages or unions, or other circumstances that place individuals or groups of people on the same plain, rather than hierarchically dependent. For instance, a brother or mother of the family head would not be a part of the nucleus of the head.

Migration data are included for family members that have left the family since 1971. Number of people which left the community complements data from the first phase of the study where responses were obtained about the number of families that left the community in the last three years.

Reason for leaving the community reflects on local conditions, the same with reason for coming to the community in the case where the family unit arrived there in the last six years.

Education and Health

This short chapter contains the introductory questions out of the education chapter and the health chapter of questionnaire B. These are repeated in A to provide a larger sampling for these questions, because more precise, quantitative estimates are desired.

Structures and Equipment

The one page chapter on structures and possessions is designed to catch only capital items that could possibly relate to productive processes. Values are asked only for major kinds of equipment that deal with agricultural production. The calculation of depreciation based on a straight line since time of acquisition is:

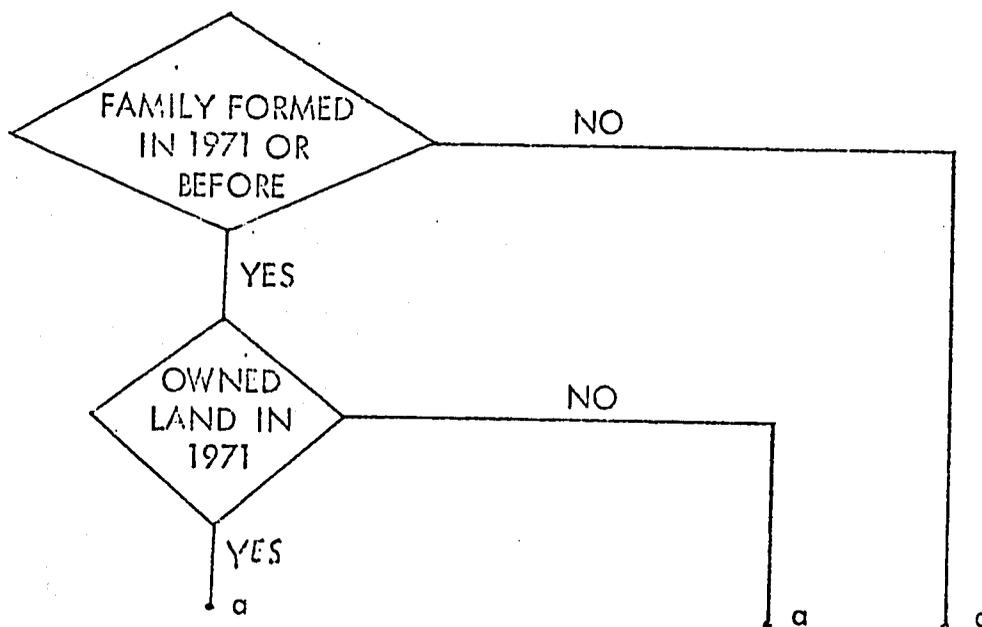
$$\text{Annual depreciation cost} = \frac{\text{Value at acquisition}}{\left(\frac{\text{Estimated total years of life} - \text{Present age}}{\text{Number of years since acquisition}} \right)}$$

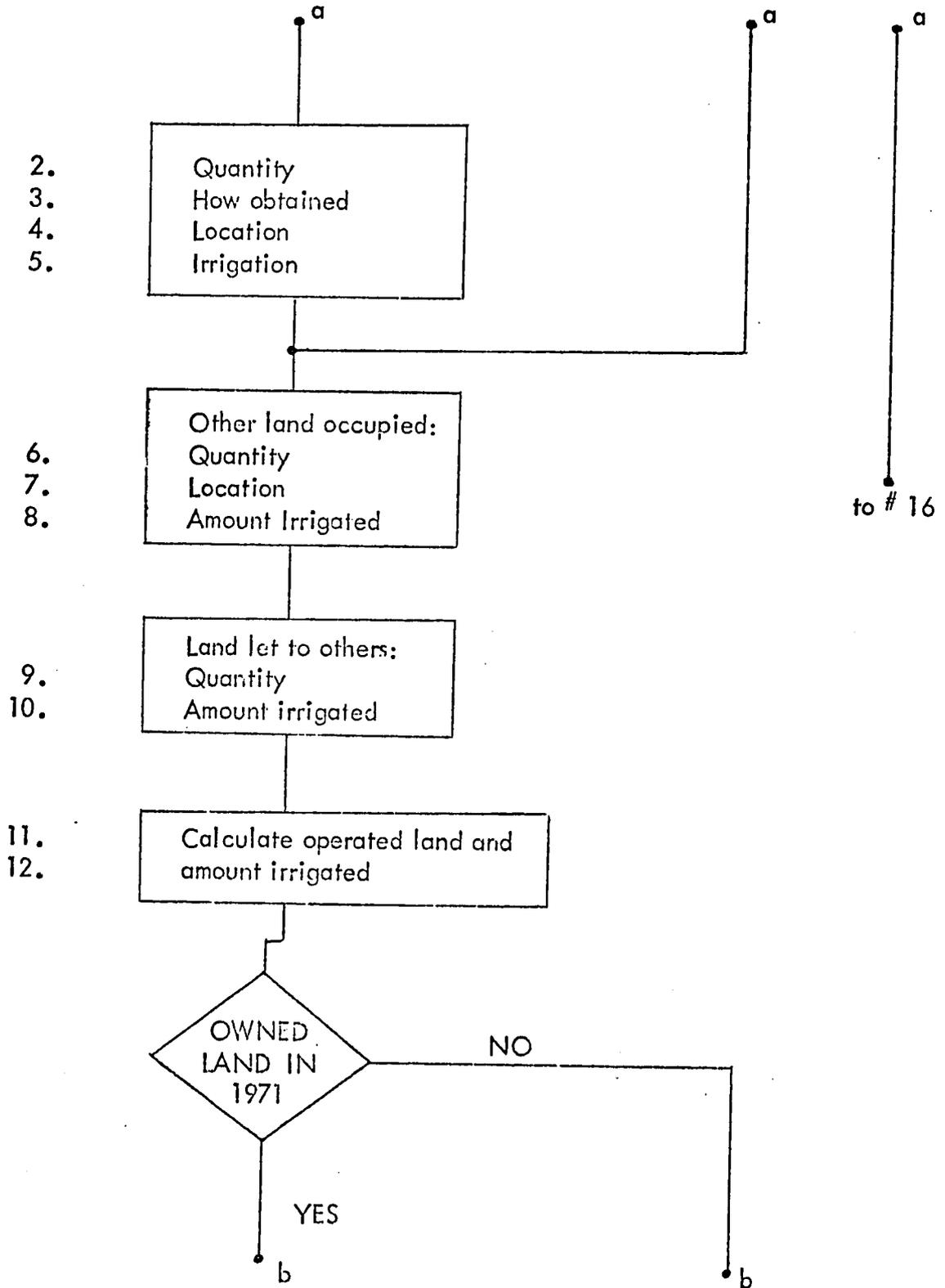
Estimated total years of life is the useful life that the equipment can be expected to achieve. This must be estimated by the investigators, applying the same estimate to all capital items of a given kind. Responses in the questionnaires will help arrive at these estimates.

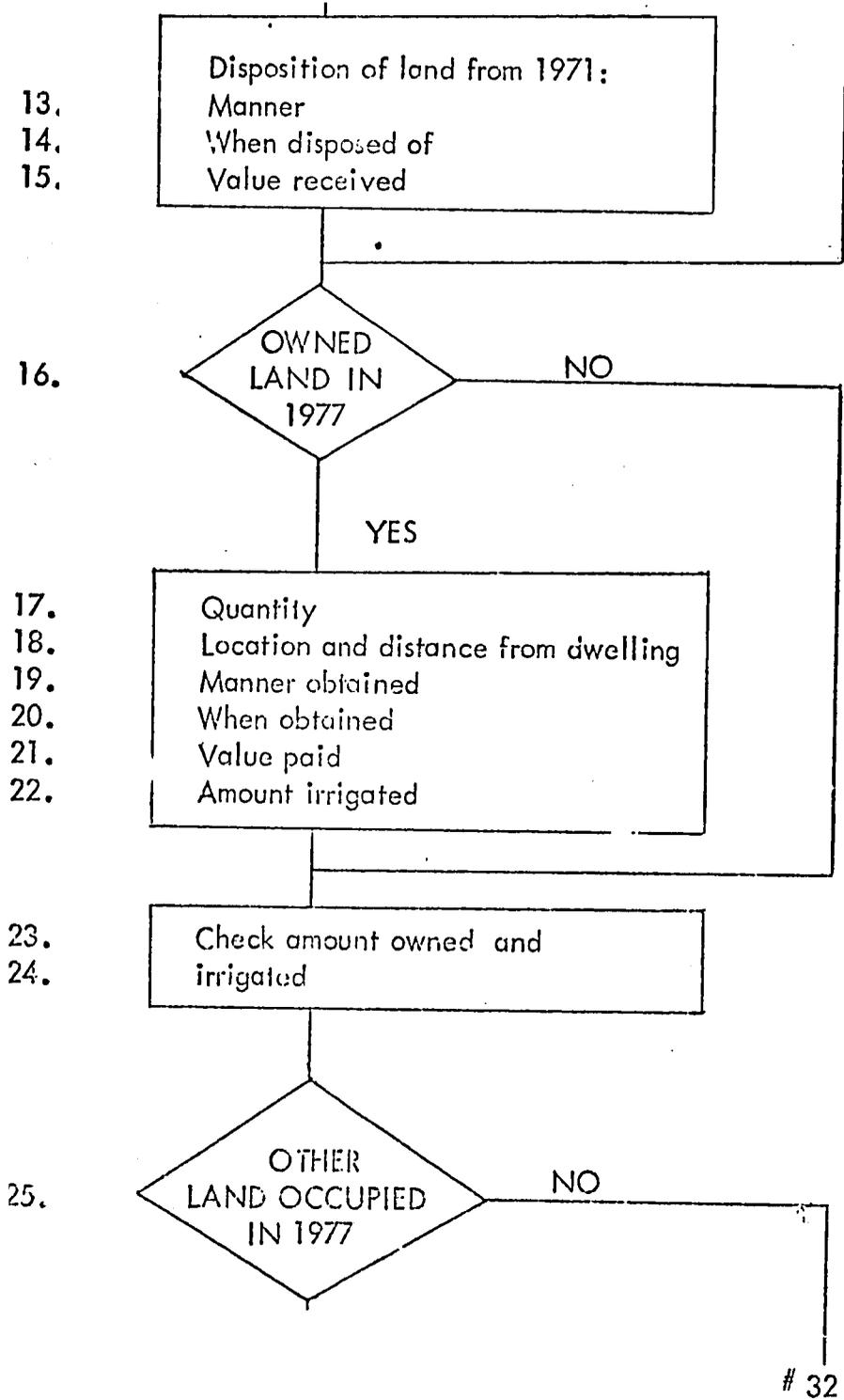
Land Tenure

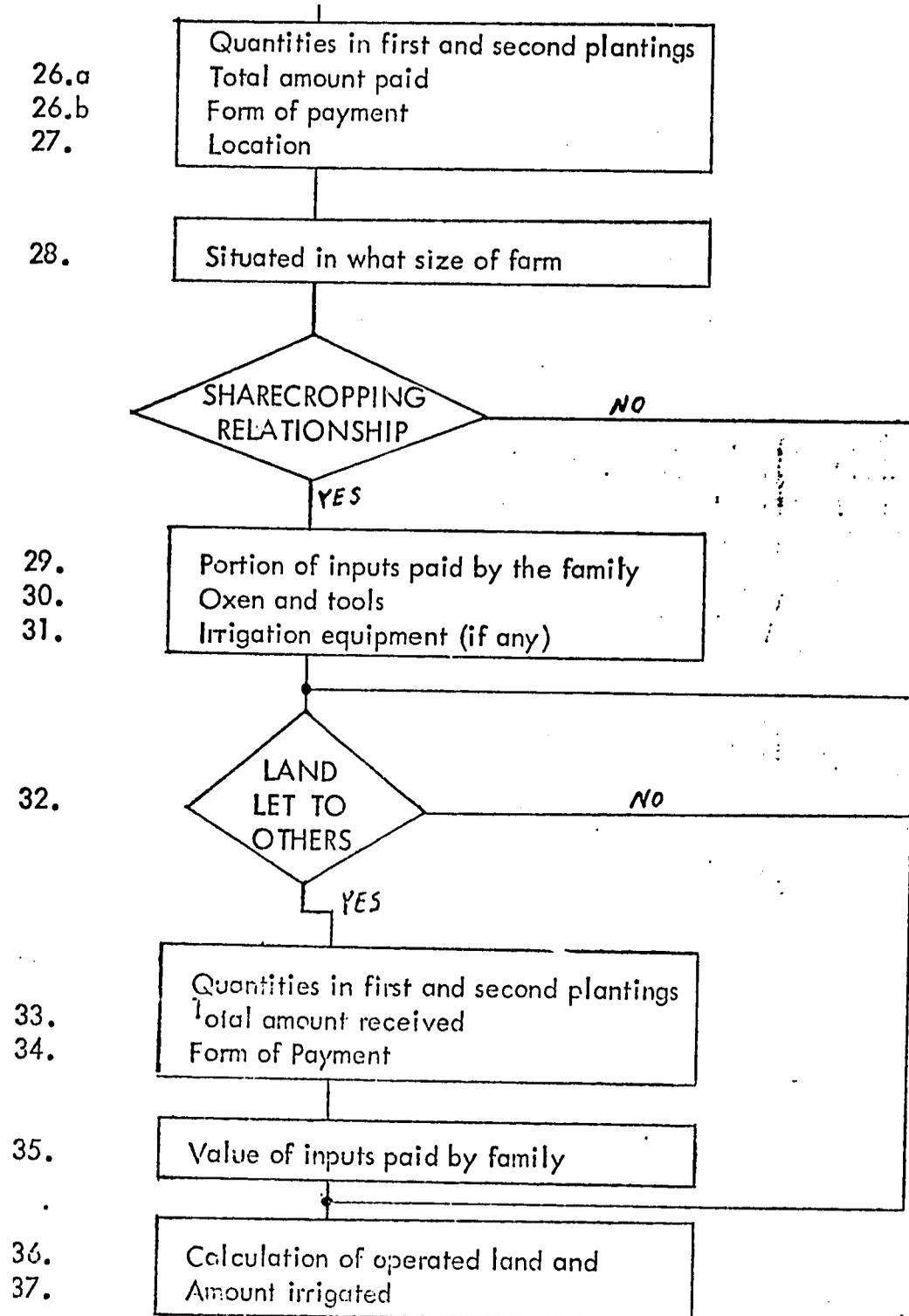
This multi-part chapter begins with a history of the family's tenure situation from 1971. The 1977 tenure situation is addressed in somewhat more detail, including questions relating to the nature of sharecropping relationships. The final product is the total of land operated by the family, which leads into a summary of how this land is used.

The following flow chart should help in understanding the sequence of this chapter.









though this chapter is one of the more complex, tabulation of most variables is fairly straight forward, involving simple sums and averages. Calculation of cost of using land per manzana or revenue from letting it to others should be done on an annual basis, to account for both plantings:

$$\text{Annual cost of land per manzana} = \frac{\text{Total amount paid}}{\text{Total land in first and second plantings divided by two}}$$

The denominator represents the average amount of land used throughout the year. One caution should be added to the above. If examination of the data reveals that rates paid in the first plantings are greater than those paid in the second, presumably because marginal production is higher, then the weighting should be changed. The first planting could be counted as .6 of a year while the second planting could be .4, or some similar balance based on survey results.

Question number 35 captures costs connected with land let to others, which should be subtracted from revenue to determine net return to land.

Another useful tabulation will be the history of land available to families. Besides a tabulation across all families in each strata, showing amounts of land by type of tenure, it is also possible to tabulate amounts of land available to families in their own communities, again giving an historical picture. The same tabulation would be done, with the following changes:

- a) Only families that lived in the same community in 1971 would be included
- b) Only owned land and land received from others that is located in the community would be counted.

In both kinds of tabulations, it is better to keep land let to others separate, not subtracting it from land received. And in both cases, it would be instructive to include cost per manzana as discussed above. Further prices per manzana for land sales and purchases can be included.

Crop Production

The important aspect of this chapter is tabulation of costs and revenues of different crops. Crops that are interplanted with others are treated together as a single enterprise. Costs and revenues are only those which pertain to the family.

The portion belonging to a partner or landlord should not enter the tabulation, except where specified as such.

$$\text{Production pertaining to the family} = \text{Amount sold in standard units} + \left(\frac{\text{Production in standard units}}{\text{Production in local units}} \times \text{Home consumption plus animal consumption and other uses in local units} \right)$$

This excludes the amount of production that went to the landlord, and excludes after-harvest losses.

Value of production can be computed in different ways depending on the valuation placed on product used in the home. Using the salesprice received by an individual farmer would reflect variations in opportunity cost between them due to distance to market, regional variations in prices, or quality of the product. This would not be the case where the farmer made an emergency sale or was able to sell at an especially good time. Since we have asked for the total value of sales, not just for the price at the last sale, or the largest sale, these problems should be minimized. Thus I would suggest the use of the following formula, which places a different value on each family's product:

$$\text{Value of production} = \frac{\text{Value of Sales}}{\text{Amount Sold}} \times \text{Product pertaining the family}$$

To compare costs with value of production of interplanted crops, the values of production would need to be aggregated to represent a single enterprise. An additional note on costs is that value of seed produced on the farm should be estimated for each crop.

Livestock Production

Since livestock is frequently held for short periods of time, being subject to continual transactions, it more resembles working capital than long term investment for the majority of rural families. Thus the concept of income from livestock used here includes changes in value of inventories as a part of income, whether a sale is made or not. Gross margin, which is income obtained less costs of acquisition is calculated:

$$G. M. = \text{Sales plus value of home consumption} - \text{Purchases} - \text{Value of initial inventory} + \text{Value of ending inventory}$$

Gross margin less production costs equals net income from livestock.

A series of examples will clarify the usefulness of this formula:

1. An animal purchased the previous year and sold in this period enters initial inventory (as a cost of goods sold) and enters sales as a revenue. Thus only increased (or decreased) value accruing to this period is applied.
2. An animal on hand at the first of the period, then sold and replaced with another of equal value, which is on hand at the end of the period, does not affect income at all.
3. Deaths of livestock in the period get recorded as losses if they appear in purchases or in initial inventory.

For a few "large" farmers, the livestock inventory should probably be treated as a permanent investment. In this case, purchases and sales breeding stock would be counted as investments and disinvestments, and cattle would be subjected to a depreciation scale, rather than counting them at their market value. It is possible to do this by separating households that have more than (say) 10 cows and tabulating breeding stock separate from the others.

Another useful calculation to be made from this section is cash income. This concept might be modified to include not only cash sales, but also value of home consumption (since this diminishes household purchases), and cash expenses, including purchase of livestock. This would give total cash and product contribution to the household in the 12 months. The rest of income from livestock represents increases and decreases in working capital.

Income from dairy products and bees' honey is done for two periods of the year. The year is divided into the period of high production (seven months maximum) and low production. The rule on enumeration of this section is that if fewer months than seven (say four) are indicated in the high production season, the remainder (three in this example) automatically pass to the low production season. They are added in by the enumerator, so they should not be added again in tabulations. The total of months in both production seasons need not total 12, since it is quite possible that nothing is produced in some months.

In various places in this chapter, the need to value home produced and consumed goods arises. This includes animals, animal products, and grains fed to livestock. Alternatives are values given by farmers, sales price, and purchase price. The most reliable method for consumption of animals is to ask the family's judgement of the value, because of variations in value due to weight variations in animals consumed. Selling price can be used for animal products, and purchase price for grains, only when some amount has been purchased or sold. If no sale or purchase has taken place, the value which the family members give for the product is probably a reliable estimate of market prices in the community. Seasonal variations in prices are not accounted for systematically under any of these systems.

Non-Agricultural Production

The calculation of gross margin from the first table in this chapter is done by a weighted average of sales through the year multiplied by average net earnings per C\$100 of sales. The formula for total annual sales is:

$$\begin{aligned} \text{Total annual sales} &= \left(\text{Maximum sales} \times \text{Frequency} \right) + \left(\text{Minimum sales} \times \text{Frequency} \right) + \\ &\quad \text{Normal sales} \times \left(\text{Total number of sales per year} - \text{Frequency of maximum and minimum sales} \right) \end{aligned}$$

And gross margin is calculated by multiplying annual sales by net earnings per C\$100 divided by 100. The frequency asked for at the first of the table plus number of weeks of activity per month, and form of participation are all for general orientation and additional information. They do not directly enter into calculation of earnings.

Costs considered by the respondent when giving net earnings per C\$100 of sales will vary with the type of activity, but will rarely represent all cash costs incurred. The questionnaire does not go into detail here because: 1) the number of non-agricultural enterprises are few, making a high degree of detail of less interest, 2) the difficulty of estimating costs other than raw product and labor is considerable for such a large variety of very small enterprises, and 3) the volume of other costs is usually very low.

Labor costs for day workers are calculated by:

$$\text{Wages paid by the day} = \text{Days/week} \times 4 \times \text{months/year} \times \text{salary/day}$$

~~Four~~ weeks per ^{month} year are used rather than 52/12 because it is supposed that there are normal interruptions in activity due to holidays, etc.

Wage bill of monthly workers is simply months per year times monthly salary. Total wage bill includes food given to employees and unpaid, non-family workers:

$$\text{Total cost of hired workers} = \text{wages or day workers} + \text{Wages of monthly workers} + \left(\text{Days when food was given to workers} \times \text{Value Food/day} \right)$$

Employment

Income for employment is calculated differently depending on the pay period:

$$\text{Annual wage and salary income} = \text{Salary/day} \times \text{days/week} \times \text{sum of weeks/month}$$

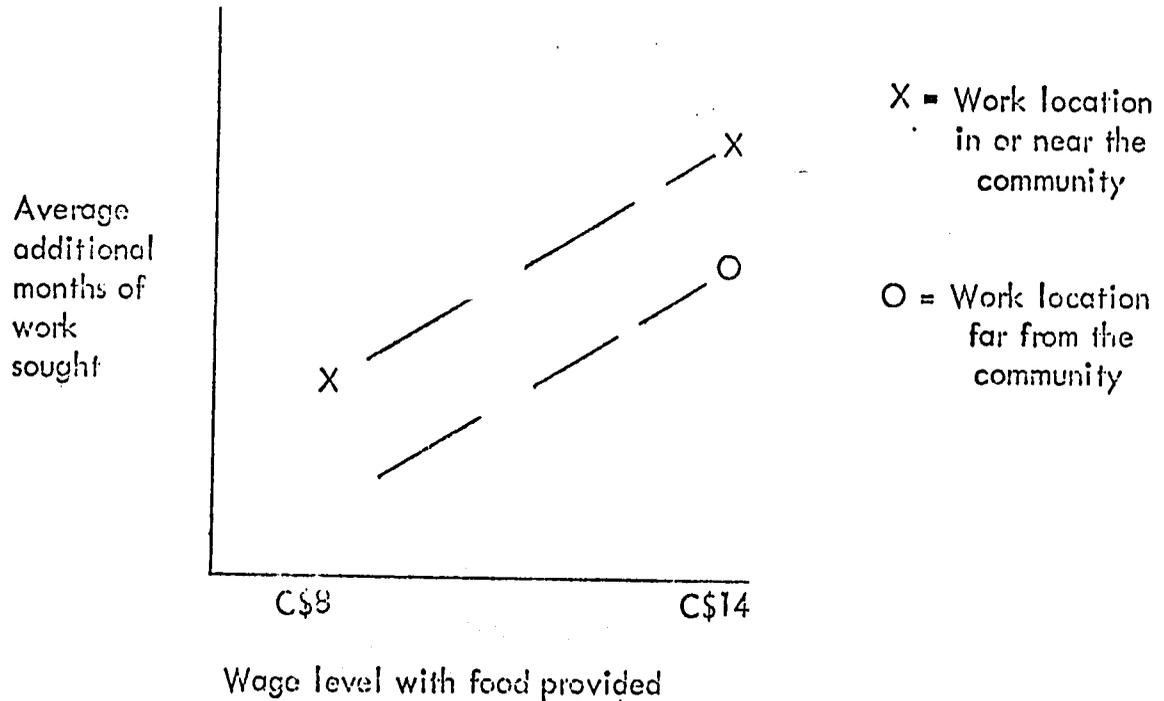
$$\text{or} = \text{Salary/week} \times \text{sum of weeks/month}$$

$$\text{or} = \text{Salary/month} \times \text{sum of weeks/months divided by 4}$$

Value of other benefits will be determined from information averaged from other chapters in questionnaires, i.e., value of food per day, of lodging, etc. Then annual costs need to be subtracted to arrive at net income from employment.

The remainder of the chapter deals with willingness to work additionally, and unemployment specified by family members. Two dimensions are specified in asking for number of months of additional work sought: wage and location. This is crossed with the family member (giving age, sex, marital status, etc.) and occupational level sought. Thus, a simple average of months of any given group will result in information that can be graphed in this form:

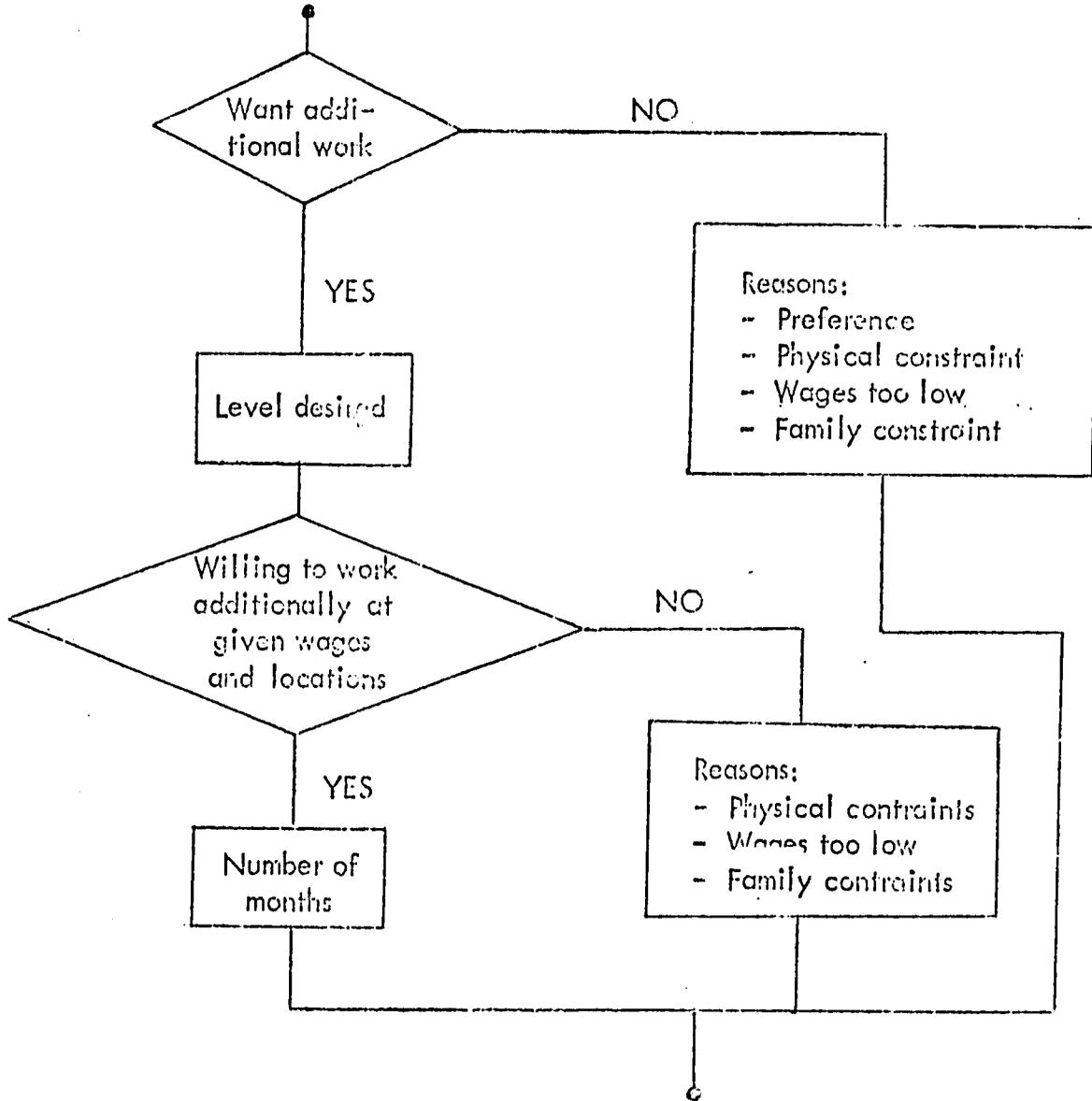
AVERAGE ADDITIONAL WORK SOUGHT BY MEN, 15 TO 20 YEARS OF AGE, AT LEVEL OF DAY LABORERS BY WAGE AND LOCATION



For those that would not consider working more at the specified wages and locations, or that would not consider working more at all, a scale of reasons is provided that is ordered from less available to more available. The respondent is being asked to evaluate both his/her actual alternatives and the hypothetical alternatives and compare them with the current activity pattern. Thus if the respondent indicates that time is available, it is presumed that he/she would occupy this time, and the reason for not doing so is that no work that provides a threshold level of benefits is available to him/her. But if the respondent indicates that no extra time is available, the limitations or reasons for non-availability are explored.

The first reason in the list indicates non-availability by preference for the current pattern of activity. The next one indicates inability due to constraints imposed by physical condition. The next three indicate that options are considered, but that net benefits are too low compared with the current pattern of activities. And the last three indicate a willingness to accept employment, but that family or landlord constraints interfere.

The following schematic gives an idea of how this list of reasons is used and what it signifies.



Thus it can be seen that the first reason in the list, preference for not participating in activities other than the current pattern realized, should not be used when the person indicates a preference for doing further work. But indications of displeasure with wage levels is allowed even though the person claims an unwillingness to do further work, as this might be an indication of discouragement of potential job seekers.

Question 10 is included as a check on the use of job search as an indication of underemployment in comparison with other measures.

Occupational Experience

This chapter is straight forward, involving simple sums and averages for tabulation. It is intended that indications of current occupations in this chapter be checked against actual work reported for the same persons in the 12 month reference period. This check of self-classification given by respondents with the other more objective information on work performed is intended to provide an idea about the usefulness of the concept of "occupation" in the rural LDC environment. The two persons to which this applies are identified in the first chapter always under codes 01 and 02 for family head and spouse, respectively. Where there is no spouse, no information will appear in the second half of the table in the chapter on occupational experience.

Use of Time: Days in the Year

Use of time receives a great deal of emphasis throughout questionnaire A and in parts of questionnaire B. This chapter places special emphasis on non-work activities as reflected by the order in which activities are listed in the rows of the table. First, specific occasions are singled out. These tend to be activities in diversions such as holidays, trips, sporting events (often on Sundays), and the like. Then inactive time is asked for, which should be easy to identify as a result of the previous chapter. Days sick is asked for on a yearly basis because of difficulties in recalling days by month. In the enumeration, days in normal work activities become a residual. What does not go into another activity is usually thought of by respondents as time spent in work (housework, employment, etc.). Sick days need to be subtracted in tabulations to arrive at a more critical estimate of days worked.

The reason for leaving work as a residual is that rural people in Nicaragua respond to this sort of questioning according to their beliefs and social mores. These guide them to claim that nearly all days of the entire year are spent working. Only by looking at the exceptions, days not spent working, can one arrive at a better estimates of allocation of time to different activities.

A check should be made after tabulations of number of days indicated in this chapter as spent in work against work days from the rest of the questionnaire. Experience to now has been that asking about individual tasks, as is done in case of agricultural work, results in an underestimation of work time. but that more

general lines of questioning such as asking for time working over the last month, result in over-estimations. It is hoped that attacking the question from more than one side with the same respondents can help develop an appropriate methodology for the case of Nicaragua.

The main topic of interest here is use of non-work time. In questionnaire B, another chapter gathers data on use of hours in the day. Together, this will provide a detailed view of total use of time of men and women, especially in activities that are not formal kinds of work.

Credit Services

This chapter is broken into a series of steps which aid in defining the several dimensions involved in use of credit. The dimensions referred to are:

- activity
- source
- specific use

Activity means the enterprise, such as corn production, hog production, or building of a dwelling. Specific use, in this instance, is the item purchased--seed, animals, or building materials. The chapter takes each of these, starting with source of credit in questions 1 through 3, turning to specific use in question number 6, and linking to activity in number 7. Codes of credit sources from questions number 2 and 3 are to be transferred into the table of number 4, where information relevant to the source are noted. Question number 5 is general for all sources. The sources from question number 4 are repeated in the same order in number 6, but are not tabulated there. Instead, the numbers marked in number 6 are transferred ahead to question number 7. The number indicates the specific use and indicates the source by its position, e.g., numbers 01 through 14 correspond to the first source listed in the table of questions number 4. Numbers 15 through 26 correspond to the second source, etc.

The cost of credit can be tabulated from number 4 by the following formula:

$$\text{Cost of credit} = \text{Amount paid} + \text{Amount to be paid} - \text{Amount received}$$

Annual interest rate is calculated by dividing cost of credit by outstanding credit times the loan period in years, which is estimated as follows:

cept when the loan period is greater than 12 months, the cost of costs applying to the last 12 months is:

$$1 - \frac{12}{\text{period}} \times \text{Cost of Credit}$$

$$\text{Interest Rate} = \frac{\text{Cost of Credit}}{\text{Amount Received} \times (\text{Loan period in months} \div 12)}$$

This can be converted to percent by multiplying by 100.

The questionnaire could have gone into much more detail about amounts of outstanding credit and timing of repayments. However, some confusion arises with respect to some sources, such as INVIERNO, since the loan period begins when materials are delivered, yet interest may start accumulating before this date. Also the period will vary for different crops, though they are on a single loan and are paid back with a single bill. The best way to avoid a long series of questioning is to define the period as the total elapsed time for the first delivery of materials till the last payment.

Technical Assistance

This chapter is modeled after the previous one. Codes are the same for those institutions that appear in both chapters, for ease of tabulation. In question number 1, the source of technical assistance is identified, and it is linked with activity in the table of question number 22. The rest of the chapter is straight forward.

Marketing

This brief chapter contains general questions for which no special comment is needed.

Other Income and Transfers

A very brief treatment is made here of property income, interest income, and receipts or payment of a few kinds of transfers--inheritance, lottery, taxes and other. It is expected that little use will be made of this page, since most families are not that far integrated into the capital accumulation process. But a check is necessary to help explain what otherwise would appear to be inconsistencies in particular questionnaires. An important note in enumeration of this page is that there should be no duplication of answers from other chapters, especially number 4 in General Characteristics, and number 33 in Land Tenure.

Formal Organization

This final chapter of questionnaire A is identical to a portion of a more

complete chapter in Questionnaire B, that covers formal, informal, and political organization. This portion is included in both questionnaires because of special interest in determining participation rates of rural people in local organization. For a discussion of this portion of the chapter, refer to the discussion of Questionnaire B.

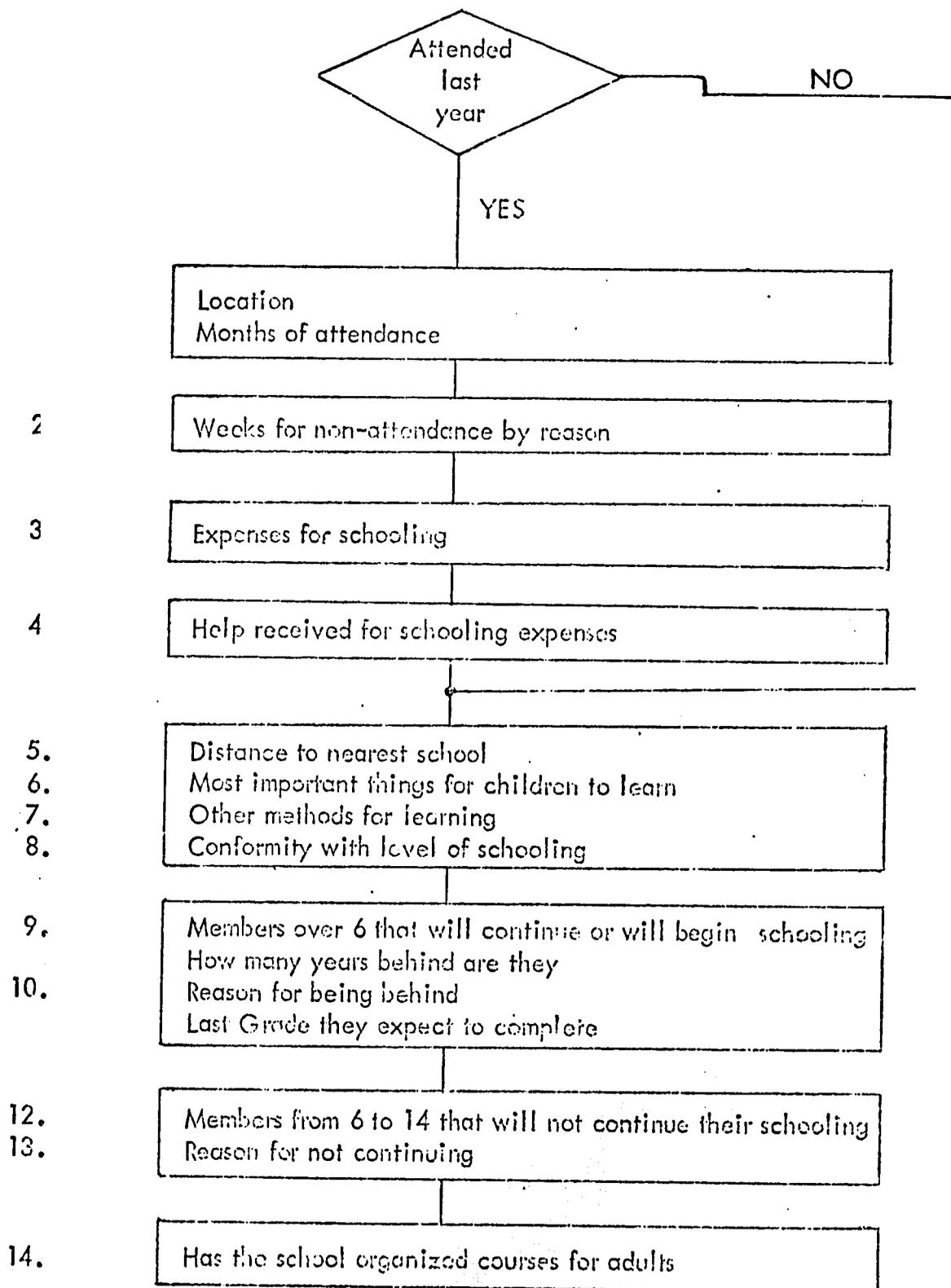
Questionnaire B: Use of Income, Public Services, Well Being

General Characteristics

This chapter is identical to the first chapter of questionnaire A. The reader may refer to the explanation given earlier.

Education

This chapter contains portions on current (1977) school attendance, reasons for being behind in school, and reasons for dropping out of school. There are additional questions on attitudes about schooling. The following diagram should help clarify the structure of this chapter:



Note that all members from 6 to 14 years of age must be represented in questions 9 or 12, but not in both.

Health

Question number 1 is designed to identify the members that are regarded to have been ill in the last four weeks, and number 2 is to measure the loss in manpower resulting from illness. The most important consideration here is the reference period. One month, or four weeks, seems to be a short enough time for people to recall easily who was ill and for how long. It was observed that when we referred to the last month, people would mention illnesses in the last calendar month or in the current month up to the date of the interview. If the interview was on February 15, the reference period used by the respondent is from January 1 to February 15, or six weeks rather than four. There is a marked tendency among enumerators to want to fill blanks in the questionnaire with as much information as possible, causing them to report this last illness, no matter if it occurred in the last 30 days, or in the last calendar month. If the response is used as an estimate of number of days ill in the last 30 days, an overstatement of days ill occurs. Thus, the terminology "last four weeks" is much superior, and this must be coupled with rigorous training of enumerators.

The other problem with reference period is not so easily overcome. This deals with seasonal variations. Several seasonal factors could be of influence in determining number of days ill. Some are rainfall, sanitary conditions, water quality, temperature, amount of strenuous labor performed, and others. A rough check can be made with this same information in Instrument A. Questions 1 and 2 in this chapter also appear in Instrument A in the brief chapter on Health and Education. And later in the same instrument, the chapter in Use of Days in the Year asks for number of days ill during the entire year. Comparing days ill during the year with days ill in the last four weeks multiplied by 12 would ostensibly lend itself to a rough check on seasonality. (This would be done for averages across a larger number of persons.) But the other factor involved here is recall of number of days ill during the entire year. It appears that this problem will go partially unsolved until more information on seasonality of illnesses become available in Nicaragua.

A similar question regarding expenditures on health care arises in questions number 10 and number 11 in this chapter. Question number 11 was included to try to detect recall problems. Though the responses to number 11 will probably be considered less reliable for overall averages, there is a gain in detail of out-of-pocket expenditures for individual families. This is especially important in the case of a family with large health expenditures that they can recall well, but that are not within the last four weeks.

Nutrition

This chapter went through several reformulations during its development. Its final form is the briefest and simplest, requiring a minimum of enumeration time, yet gathering all information initially desired.

Types of food are to be enumerated by basic ingredients when possible. Thus, all products of corn, for instance, need not be listed separately if the respondent can give the amount of corn consumed by the family for the day, as is usually the case. Number of persons eating with the family in each meal and between meals is given, along with types of food consumed. Quantities are for the entire day, which should give better results than asking for them for each meal. This reduces complications in enumeration time, especially since this is the form in which rural people (housewives) are usually prepared to answer.

"Yesterday" was chosen as the reference period because of continual experience in field trials with inflation of frequencies and amounts of certain items consumed, when asking for longer periods, or asking for averages. This is the same experience noted in studies elsewhere. The check in the case of our field trials was to ask for the diet of a typical day, then ask for specifics of "yesterday". The latter nearly always showed a less favorable diet than that described for a "typical" day, though the time of year of the field trials varied. This technique of referring to the previous day does, however, infer considerable seasonal variation, especially since the survey is during the dry portion of the year, after harvest, but when family gardening is at a low. The justification is that it is better to have a good measure of the diet at a given time of year, than have a poor measure for the entire year.

Tabulation of this chapter requires the assistance of a person familiar with dietary standards and nutritional values of foods as they are prepared by rural families in Nicaragua. These are needed to assign caloric values, and vitamin and protein contents to each type of food consumed. Since another study has recently been completed by the Comité de Nutrición, which requires a similar tabulation process, the same weighting used for that survey can be employed by DIPSA. This would aid in comparison of results since the method of questioning used by the Comité was not for the previous day, but for a typical day. The sample of families used in that survey is comparable in Region V, being slightly larger than DIPSA's sample for Questionnaire B, but being concentrated in fewer places. Selection procedures used in both surveys are similar, and the rural portion of the Comité's sample seems to come from the same population as DIPSA's.

Dwelling and Possessions

This chapter is straight forward, and is not too much different from those in other questionnaires used in Nicaragua (Census) and elsewhere. The user should note the correspondence between the question in the chapter on the source of water, number 7, and those on water quality in the chapter on Health, numbers 14 through number 17.

Household Expenditures

In this chapter, the reference period is chosen by the respondent -- week, two weeks, month or occasional -- depending on the type of purchase mentioned. Average expenditure per period is asked for, rather than expenditure in the last period. This decision was made because it is felt that respondents are able to give a reliable figure, averaging over all periods of a year, thus helping adjust for the problem of seasonality, which is considerable in this case. Problems with inflating figures to impress enumerators are felt to be minimal because most kinds of purchases are fairly routine. Prestige items, such as eggs and meat are normally obtained from home production. Exceptions where enumerators need to watch for elevated responses seem to be with women's clothing, and perhaps children's clothing.

A further question on the period helps pin down the matter of average expenditure. If the respondent says he/she purchases clothing monthly, and spends X amount per month, then he/she is asked how many months this kind of purchase was not made in the last year. The enumerator takes the difference and enters the number of times per year that the purchase was made.

Use of Time: Hours in the Day

This is a counterpart of a chapter in Instrument A called Use of Time: Days in the Year. The two parts were separated because it was felt that neither requires a full sample of families, and it can be seen that they are completely independent in their enumeration.

The questioning in this short chapter is similar to that used in questions number 5 through number 9 in the chapter on Employment in Instrument A. A breakdown of use of hours during the previous day is given either for the head of the household or for the spouse. (See the questionnaire for the system of selecting between them) Question number 2 gets to the point of the chapter. This is to explore the possibility of underemployment during the day. One form of under-

employment is to stretch activities over the time available, when in reality, more would be done by an individual if there were opportunities to do so. It is intended here that the respondent indicate if this is the case, in his/her response to question number 2. Thus, the response requested reflects upon the pattern of activities listed, but cannot necessarily be seen directly in that pattern. Only a good training of enumerators, so that respondents realize what is being asked, will obtain reliable responses to this section. Still, the response to question number 2 is not to be taken at face value. In the same manner as the chapter on Employment, the list of reasons for not using this time are sought out. Reasons higher up on the list indicate non-availability even though the respondent has identified some time as "free".

Codes for activities in the daily activity pattern are organized in the manner in which it is expected that they are most useful for analysis. However, because of sample size, only a general idea will be gained. For example, of 167 completed questionnaires of type B, half, or about 83, will be with family heads, and perhaps about 65 of these will be with male heads. Each will respond for the previous day, giving a sample of about 10 responses for each day of the week from male family heads. And these are at one particular time of the year. Nevertheless, for the general purposes in mind, this size of sample is considered reasonable, considering especially that most answers are expected to be similar across people of the same sex and across days, except for weekends. If for some reason this turns out not to be true, perhaps due to time of year, the information that results from this section should be used only for very limited purposes. It can be easily compared with data from the chapter on Use of Days in the Year, and Employment to help check for seasonal variations in work-related activities.

Production and Employment

As can be seen, this is a compilation of sections for five chapters in Instrument A: Land Tenure, Crop Production, Livestock Production, Non-Agricultural Activities, and Employment. Only a minimum of data is collected on these activities to identify the size of each enterprise in which the family partakes. It is felt that family income can be reasonably estimated by knowing:

1. How much land the family owns
2. How much land the family operates
3. Breakdown by specific crops
4. Amount of livestock owned
5. Amount of livestock managed
6. Nature of relationship with partners in livestock

7. Volume of sales in non-agricultural activities
8. Employment income

Enough specifics are included to apply average earning per manzana or per head from families completing questionnaire A to those completing questionnaire B. The detail being sacrificed deals with exact levels of production, price, and costs. The variations expected in these are not as great as variations due to size of enterprise and ownership of land. Family labor input, which is the next largest factor, can be estimated by size of family labor force, taking out labor in salaried employment.

Since computation of income has many steps, they will not all be detailed exactly here, but generally, the pattern of computations would appear like this:

$$\begin{aligned}
 \text{Net Family Income} = & \left(\text{Land let to others} \times \text{Estimated price per } \underline{\text{manzana}} \right) - \left(\text{Land rented from others} \times \text{Estimated price per } \underline{\text{manzana}} \right) \\
 & + \left(\frac{\text{Manzanas of each crop}}{\text{Estimated net income per head by type}} \times \text{Estimated net income per } \underline{\text{manzana}} \right) + \left(\text{Number of live-stock of type} \times \right. \\
 & \left. \text{Estimated net income per head by type} \right) + \left(\text{Value of sales from non-agri. activities} \times \text{Estimated profit margin} \right) \\
 & + \text{Employment income} - \text{Interest paid for production activities}
 \end{aligned}$$

Net income per manzana of crops, per head of livestock, and profit margin from non-agricultural activities would be functions of family manpower available, and manpower requirements of all these activities operated by the family. Net income per head of livestock also depends on relationships with partners, if any. It is felt that there will be several simplifying assumptions that can be made to reduce the amount of calculation necessary, once the questionnaires are completed and examined.

Credit Service, Technical Assistance, and Marketing

These three chapters are identical to those in Instrument A. The reader may refer to the corresponding explanation of that questionnaire.

Psychosocial Factors

This part of Instrument B contains several portions:

Values
Attitudes
Feeling of Security
Conformity
Organization: Formal, Political, Informal
Geographical and Historical Knowledge
Emotions

Since this chapter was primarily developed by others in DIPSA besides myself, less explanation will be included here than the chapter deserves. It is worth reporting that field trials of this chapter have helped uncover difficulties in methodology in other portion of both instruments. Some of the comments in other portions of this report are based upon observations derived from attitudinal responses of rural people. More specifically, the manner of questioning in some places dealing with work and use of time, plus household expenditures and nutrition have been changed in part due to responses to the portion on values. More specifics on education were included resulting from responses to values and conformity. More emphasis on health throughout the study, and in the analysis, is thought necessary due to emphasis placed on this factor by rural people. By the same token, the dwelling is probably seen as less important than investigators originally thought it to be because of responses in field trials.

The value of this section as a methodological tool is only now becoming apparent. The chapter continues to be somewhat tentative, searching out the importance of aspects of life not as clearly understood as those in other parts of the survey.

Tabulation of this chapter is done in a series of indexes. These are mostly straight forward, and will not be detailed here, because it is presumed that the exact tabulation of them may need some minor adjustments after the survey is completed. That is, emphasis can still change in many parts of this chapter, depending on the kinds of responses obtained.

Additional Health Survey

Mention here should be made of an additional part of the study that was developed when most of the other portions of the study were already prepared. This

part of the study deals with health of rural families, in addition to the sections on health included in the two instruments already described. The brief questionnaire to be employed in this study was developed with the assistance of a team loaned to DIPSAs from the Ministry of Health. This instrument is entirely prepared and preparations for tabulation are completed in the same way as those for the other two DIPSAs instruments. The purpose of this portion of the study is to determine the current status of rural families with respect to health. It is felt that this aspect of rural well-being is probably the most critical in determining productive, and consumptive capacity of rural families.

No special mention need be made here about the questionnaire or tabulation procedures. But some indication of the means of managing this team in the field merits documentation here. The sample size for this study was chosen to be 60 families. These are chosen from families that will also respond to questionnaire B, and the selection procedure was to pick every third group or cluster. Thus this portion of the study will visit 31 clusters in 29 communities, and will interview 62 families, two from each group.

The team is provided with an extra supervisor who will accompany this team to the communities where they work. The supervisor will select the families to be interviewed according to the selection for questionnaire B. The following day, the supervisor will return to the same community with a team of DIPSAs interviewers to interview the same families, plus four others corresponding to Instrument A. This method of operation was chosen because only two families must be chosen for the health team, but six must be chosen for the DIPSAs team. Having the health team work in the community first reduces the time pressures for family selection, and the supervisor will be better oriented to return later to select additional families for the DIPSAs team.

Field Team and Operation

Personnel to be used for field work are the following:

- 3 coordinators
- 6 supervisors
- 13 enumerators
- 2 nurses
- 9 drivers

These people are formed into five enumeration teams, four for the DIPSAs questionnaires, and one for the health questionnaire:

- teams of one supervisor and 3 enumerators
- 1 team of one supervisor and 2 nurses
- 1 extra supervisor with one enumerator
- 1 field coordinator
- 2 coordinators linked with data processing

The extra supervisor and enumerator were included as a backstop for situations that are especially difficult to reach, or where enumeration falls behind schedule for any other reason. Note that supervisors rotate among teams, that is, one day they may work with the health team, the next day they may be with a team of three enumerators, and the next day they could be doing special (cleanup) work as the extra supervisor.

The cluster of 6 families used in sample procedures was based on two interviews per day by three enumerators. Supervisor are to select families in all cases, and to review completed questionnaires.

Review procedures for questionnaires are as follows:

1. The enumerator takes a look at each part of the completed instrument before leaving the family. This should take about 20 minutes.
2. The supervisor looks at the questionnaire the same day, looking mainly for logical errors as well as enumeration errors.
3. The coordinator looks at some questionnaires, giving them a spot check for any kind of error.

Questionnaires are to go straight into keypunching the following day, if possible, after which, a program of inconsistencies will check for further errors that affect tabulation. Field coordinators should receive outputs from that program as soon as possible so that corrections can be made before supervisors and enumerators cannot recall the nature of the particular interview in question. No major factual changes should be made in the questionnaires unless they are definitely substantiated by information stemming directly from the interview. If there are serious problems with a questionnaire, it should be rejected, rather than be "patched up" according to what investigators think is correct.

COMMENTS AND SUGGESTIONS

Only a few comments dealing with a variety of aspects of the survey will be included here. Without a full analysis completed, it is not possible to go into detail about all the specific changes that could be made in another study of this kind. First in relation to the community survey instrument:

- more interdependencies among communities need to be identified. This applies mainly to smaller communities.
- More on the relation of large farms to the communities might be included, as a attitudinal section of this survey.
- More specifics on numbers of people in different occupations could be asked for, especially in reference to those who leave the community in search of non-agricultural work.

These suggestions reflect two conditions perceived in this study: 1) that the average survey time (1 1/2 hours) was shorter than expected and shorter than respondents seemed to be able to handle, and 2) respondents seemed to be capable of giving information in more specific forms than we requested of them.

On sampling of communities in the first phase of work I would not make use of secondary information for stratification. Instead, it seems to make more sense to keep the number of communities in the sample very high, and rely on sample size to provide good representation.

On definition of the community, a more simplified system might be used that would exclude the concept of comarca (found not to be meaningful in most rural places) and would ask for names of neighboring communities, locating them by direction -- north, west, south, east. Further, in definition of the community, more care should be taken in enumeration of question number 5 to insure that number of families reported to be in large farms in the community are actually, themselves, in the community. That is, a large farm can be in more than one community. The families in those farms might be in a part of the farm in another community, and should not be reported in question number 5.

Finally, the seminar at the end of the community survey should be an initial tentative discussion among professionals interested in the subject matter. The

increase in elapsed time caused by developing a full two-day presentation and 35 page report is not justified, considering that analysis can only be sketchy at this point, since it covers only the first phase of work.

CURRENT STATUS OF STUDY

The family survey has not yet been completed in the field at the time of submitting this report, due mainly to security considerations for the enumeration team. DIPSA remains confident that the study will be completed within the next few months or the beginning of next year at the outside. Instruments are completely prepared, as indicated herein. Manuals for training of enumerators are prepared, as well as a program for training. Other materials for selection of families in the communities, maps, etc., are also ready. Key punching will be done directly from questionnaires. Programming necessary for preparation for the questionnaire, for reading the keypunched information, and for checking for inconsistencies, has been virtually completed. The guidelines contained in this report are meant to be used for tabulation into output tables or for simple regressions or graphs. With these materials, plus the set of well-identified files that are left in the Nivel de Vida section, DIPSA is assured of the capacity to carry the study out when this becomes possible. Naturally, it is critical that competent, dedicated people are made available to direct field work and tabulation.

Technical assistance to DIPSA for this project has been temporarily suspended as of February 7, 1978 to begin again before March 27, 1978. During the last month of work, to begin in March, an effort will be made to train people assigned to the project by DIPSA so that a team remains intact that is capable of carrying through with field work and tabulation when that becomes possible.