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The 1979/81 Bolivian Rural Household Survey

Report on Consultation Trip to La Paz, Bolivia

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## ACRONYMS

RHS	Rural Household Survey
MACA	Ministerio de Asuntos Campesinos y Agropecuarios
CONEPLAN	Consejo Nacional de Economía y Planeamiento
INE	Instituto Nacional de Estadística
GOB	Government of Bolivia
DP	Data Processing

## 1. Introduction

This report constitutes a follow-up statement to a preliminary survey design paper which I wrote in August 1978 based on a two-week TDY in La Paz. The purpose of that paper was to initiate discussion regarding design and implementation of a rural household survey (RHS) in Bolivia. The RHS was visualized in that paper as a major statistical sample study designed to yield information on rural (landed and landless) household incomes, expenditure patterns, food consumption habits, and nutritional status. Accordingly, the paper contained a brief conceptual introduction into the economics of the rural household, a questionnaire by which the information needed for a causal economic analysis of household budgets is solicited, a suggested field methodology, and finally, an attempt to identify the interest and readiness to cooperate of potential GOB counterpart institutions.

A series of problems, including difficulties in obtaining a commitment on the part of a GOB institution with the necessary personnel and infrastructural and financial resources to house the RHS, are responsible for the fact that little progress has been made in planning for the survey between August 1978 and August 1979. Verbal assurances of interest in the study have come forth from several GOB institutions (CONEPLAN, MACA, INE), but funds are tight and (remarks to the contrary in the 1978 report notwithstanding) enthusiasm for the survey is not sufficient in these institutions for them (or any one of them) to take initiative in survey planning and mobilization of counterpart funds. The burden of survey

planning and financing lies therefore with the Mission which is interested in rural expenditure and consumption data for its agricultural sector assessment and review of loan programs.

The purpose of this three-week TDY in La Paz was to advance RHS design and planning by several steps in preparation for the phase of data collection in the field which is to begin in 1980. Many of the issues in survey planning which were treated in the earlier report are therefore taken up and subjected to a second round of reflection and discussion in this paper. New insights are incorporated where pertinent and a number of modifications are suggested.

## 2. Choosing Between Two Types of RHS

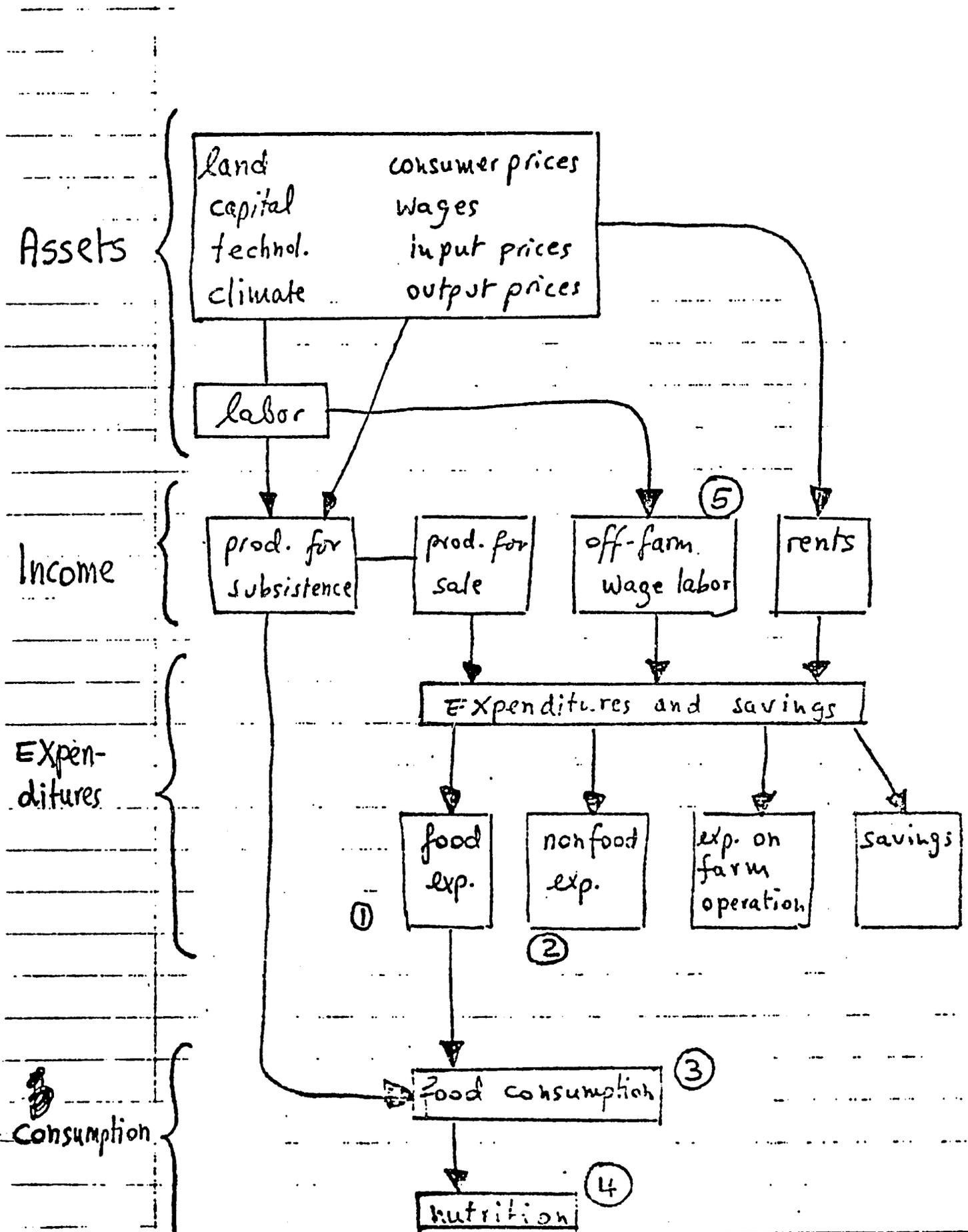
The original idea I encountered last year and again at the beginning of this TDY was that the Bolivian RHS was to be an in-depth study of the rural household economy in order to contribute to knowledge regarding the genesis and distribution of rural poverty. This focus requires an investigation of consumption and expenditures on the one hand, and on the other, an investigation of the determinants of budget allocation patterns. The latter implies empirical observation of all those variables which bear on income. The process of income formation among the poor is complex because low remuneration earned in any one gainful activity forces them to engage in a number of paid activities at the same time or at different times throughout the year. Matters are doubly difficult in the rural areas where people have the option to vary the proportion of income derived from subsistence, or on-farm, production in accordance

with price levels in the markets for consumer goods (including food), farm inputs and outputs, and wage levels in the labor market. Diagram 1 shows in flow-chart form how the peasant family economy can be broken down into stocks and flows and how expenditures and consumption are determined by income which, in turn, depends on assets and market prices. The original concept of the RHS as an in-depth study of the peasant household implies that all of the variables named in the boxes of the diagram be observed in the field. This clearly represents a major data collection effort which (as shown below) will, however, pay handsome dividends in terms of analytical output.

During planning discussions in La Paz, it became evident that both the deadline for the Mission's Farm Policy Project of which the RHS is a component (Sept. 30, 1981) and the budget originally set aside for the RHS are unrealistic. A year's extension, as well as at least an additional \$250,000 over and above the original survey budget of \$350,000 would be required in order to carry out, process, and analyze a survey that would account for the full household model set forth in diagram 1. (Sample design, methods and cost functions for this survey are detailed in Garrie Losee's TDY report. The length of observation period per household would probably amount to seven days, although a pilot survey would be set up to test this and other methodological questions. Methods and costs of the pilot survey pertaining to the full-scale RHS as initially visualized are also presented in Mr. Losee's report. INE (the National Statistics Institute) would appear to be the most appropriate GOB counterpart institution to be in charge of field work and data

Diagram 1:

Determinants of Peasant Family Expenditure System



processing, but significant strengthening of the institution would be required, particularly in terms of personnel, to assure successful implementation of the survey.)

The recognition that the RHS as initially conceived would not be feasible within the planned budget and time horizon and perceived reluctance on the part of Mission administrators to extend the budget and deadline for results, led to the search for an alternative, scaled-down, data collection effort that would fit within the time and money constraints of the Farm Policy Project. The Mission, it was learned, is particularly interested in expenditures and consumption patterns of rural households, with nutritional status being a further item of concern. These points were not touched in any of the Farm Policy surveys heretofore carried out. Information on assets and income of small farmers (though not of the landless) has been collected in the 1978 National Socioeconomic Farm Survey. The quality of this information is still unknown, because the survey has not been processed. Nevertheless, it is expected that important lessons can be derived from these data and, as a result, it was decided to omit the asset and income portion from the RHS in an effort to reduce the scope of the exercise.\* Further actions to diminish costs included cutting the sample size by about 1,000 families from an original 3,120 households and not to interview during all of the 12 months of the year (cf Mr. Losee's report). Questions to be asked of respondents during the

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\* In the 1978 report resampling of the National Socioeconomic Farm Survey families was suggested for purposes of the RHS, in order to take advantage, by extrapolation, of the already collected income data, thus saving interviewing time and effort. This possibility has been discarded because of the conceptual difficulties associated with matching a given year's consumption with two-year old income data and because of sampling considerations discussed in Mr. Losee's report.

scaled-down survey --which will meet financial and time constraints-- refer exclusively to expenditures (purchases), consumption, nutrition, and, in an indicative fashion, off-farm wage employment (points 1 through 5 in diagram 1). It should be noted, though, that nutrition as measured on the basis of diet is not actually observed in the field. Nutritional intake is calculated by multiplying quantities consumed by unit nutrient content.

In the scaled-down RHS which has met the approval of Mission administrators, expenditure and consumption data will largely be obtained by recall questions, and the length of the survey period per household will not exceed ~~three~~ hours, possibly spread over two days (i.e. two interviewer visits at most).<sup>\*</sup> Instead of a pilot survey, only a questionnaire pretest is planned in connection with the scaled-down RHS. The MACA Statistics Office will carry out this data collection activity, since its resources are sufficient to meet the scaled-down demands. (See section 5 for discussion of the problem of DP.)

The new concept of the RHS constitutes a compromise between resource availability and desired data. It follows from the reduction in sample size and probably (although not yet tested by a pilot study) from the use of recall questions as opposed to direct observation that the statistical precision of the estimates derived from the scaled-down version is

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\* The same information would probably have been collected by weighing or some other form of direct observation in the full-scale RHS, although the final word regarding methods was to be reserved until after the analysis of the pilot survey.

inferior to that which could be attained by the full-scale effort. In the remainder of this section, the analytical potential of the two RHS versions is compared and the policy relevance of the data they generate is explored. The principal conclusion of the discussion is that, while the scaled-down survey will produce important and currently unavailable information, it is worthwhile to maintain alive plans to carry out the full-scale survey in rural Bolivia at some point in the future.

The scaled-down alternative generates, for the first time in history, information on purchases and consumption that is statistically valid for all of rural Bolivia. This information will complement the production and technology data which were collected in the other survey components of the Farm Policy Project (see AID Project Paper "Bolivia Farm Policy Study", 1978, on scope and content of the other surveys). On the basis of this information, target groups can be identified (or consumption patterns can be classified) in terms of total expenditures (an income proxy), the proportion of consumption derived from on-farm production, household characteristics (size and age/sex composition, educational achievements, migratory patterns) and wage employment characteristics of household members to the extent that there will be time to collect data regarding this factor.

The scaled-down survey permits the elaboration of "typical" profiles of household budgets, an assessment of the demand for food, and an evaluation of the nature and extent of nutritional deficiencies among the population. It permits the determination of the proportion of livelihood that is derived from market versus subsistence income activities. This

is of importance, because it allows analysts and planners to make a somewhat informed choice regarding the appropriateness of income-enhancing policies that operate through the market as opposed to ones that by-pass the market. By providing an independent estimate of consumption (rather than a residual one as in food balance sheets), the survey data also constitute a check on production statistics and the assumptions regarding the various uses of production built into the food balance sheet.

From the analyst's point of view, the scaled-down RHS produces descriptive information, whereas the full survey constitutes the basis for the development and estimation of analytical models.

In the full-scale RHS, information is generated regarding all household level "dependent" and "independent" variables that are of interest for economic analyses of family budgets. Consequently, it is on the basis of this, and only this, version of the survey that predictive conclusions regarding the level and composition of both family income and consumption can be derived. In the partial subsistence economy, income is not an exogenous factor, but is itself dependent on assets and prices, as shown in diagram 1. Hence, the ideal analytical approach (feasible with the full RHS) would be to estimate (in elasticity terms) the changes in

income (level and composition) due to changes in assets and prices, and the changes in consumption, demand, and nutritional intake due to changes in assets and prices, as well as in income.

In the scaled-down version, the principal explanatory variable of consumption is the sum of all expenditures which cannot be said to be "independent" of consumption and which reveals nothing regarding the economic conditions under which family income is formed. Certain analytical, including econometric, problems associated with the use of total expenditures as an income proxy were discussed in the 1978 report. For the purposes of target group identification, the income concept that emerges from the scaled-down survey (total expenditures) is not very operational, because policy is not directed at, for example, the lowest two deciles of the income (total expenditure) distribution, but rather at groups characterized in terms of those variables which determine income. Hence, target group identification is more operational when data from the full RHS are available.

The objective of the RHS, as well as the other surveys carried out under the Bolivian Farm Policy Project, is to collect information that will permit identification of policies capable of raising rural incomes. The main reason why the full RHS meets this objective more satisfactorily than the scaled-down modes is again, the circumstance that the full RHS provides data regarding assets and prices in the four markets specified in diagram 1, as well as production for sale and detailed labor allocation.

The majority of rural families in Bolivia are small farm (campesino) families, i.e. families which hold at least some land and hence have the option and, given scarce employment opportunities, are forced to derive at least part of their livelihood from on-farm work. The rural family that has no land at all is rare<sup>\*</sup>, but those who do not have access to enough land to produce their yearly food needs are numerous. Hence, income policy can be aimed at the production or the consumption subsystem of the peasant family economy. An example of income policy aimed at the production subsystem is an input subsidy. An example of policy directed at the consumption subsystem is a food subsidy.

Whereas the full RHS permits tracing the effects of both policies on the composition and level of income and consumption, in the scaled-down version only the data needed to trace the consumption effects of the second kind of policy are collected. And, indeed, the conclusions derived from the latter exercise may be erroneous, unless the proportion of on-farm livelihood of the population under study is very small. Assume that, as a result of a subsidy, the price of a staple commodity not widely grown by small farmers declines. (Wheat flour is an appropriate example in the Bolivian case.) An increase in the consumption of the commodity is then expected and (although this cannot be measured on the basis of the scaled-down RHS) time spent in subsistence activities declines in return for an increase in wage employment. Cheap wage goods such as wheat flour stimulate migration to off-farm employment. The structure of income changes, but,

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\* The term "landless" does not normally designate families without any land in the Andean countries. It rather refers to families with very little land. Definitions vary, but .5 hectares seems to be a reasonable cut-off point to differentiate the landed from the landless.

again, only the full RHS permits quantification of the change. Conversely, assume a decline in the price of a commodity that is produced by many farmers, such as the potato. The demand model that can be constructed on the basis of the scaled-down RHS will again "predict" an increase in the consumption of potatoes. (Potatoes, like wheat flour, are not inferior goods at the average income level encountered in rural Bolivia.) However, the true reaction on the part of rural consumers (measurable by means of the full RHS) may amount to the opposite. As potato prices decline, their production and subsistence consumption may decline. Demand may shift to substitutes (home-produced and/or purchased) and total nutritional intake may decline as a result of the decline in income caused by the decrease in production. If, on the other hand, off-farm work and income opportunities are sufficient to absorb the labor freed by the decline in potato production, income and nutritional intake may remain at their original levels, and the only change occurring would be a change in the composition of the consumer food budget.

In sum, it can be seen from these reflections that, beyond the descriptive level, the analytical potential and the policy relevance of the information provided by the scaled-down RHS are significantly less than those of the full model.

### 3. The Need for a Pilot Survey to Test Alternative Methodologies for the Full-Scale RHS

Before elaborating on the method of data collection and other practical issues that need to be discussed in preparation for the scaled-down

RHS, it is appropriate to explore ways to enhance the possibility to carry out the full survey in Bolivia at some future point. It follows from the discussion in the preceding section that the scaled-down data collection effort is a useful, but nevertheless meager substitute for the full RHS, because for analysis of income and consumption in the partial subsistence economy (as opposed to the all-monetary urban economy) the information provided by the latter survey is indispensable. To my knowledge, the full RHS has to this date not been carried out for a statistical sample of a whole country.\* Reasons for this include the high cost of the effort and, at least until recently, wide-spread lack of understanding of peasant decision-making regarding income and consumption behavior. However, with interest in rural development persisting and growing, there is a need for economic analysis involving the type of information collected by the full RHS. A strong case can be made, therefore, that the survey be carried out somewhere despite its cost. If U.S. Government funds can be marshaled for the project, it would seem appropriate to place the study in Bolivia to support the significant USAID commitment to rural development in that country. Not only is the information needed in Bolivia, but the social reality in the rural parts of the country (migration, growing dependence on market transactions for livelihood, yet little scope for subsistence activities to disappear) constitutes ideal ground to test a large number of hypotheses regarding income and consumption behavior of peasant families in Bolivia as well as elsewhere.

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\* However, the scaled-down RHS has been carried out in a number of ~~countries~~ for large, national samples, using more elaborate data collection procedures than the ones proposed here.

There are many methodological questions regarding variable measurement in the full RHS. They must be answered before the final survey is designed in order to make sure that the procedures which will produce the best data quality for given survey cost are chosen. The only way to objectively answer these questions is to implement and analyze a pilot survey designed to test alternative data collection methods. A number of these questions are identified and discussed in Appendices 1 and 2 of this report. They include the appropriate length of the survey per household, methods to obtain quantitative data on food purchases and consumption, and labor time allocation, production and income. They also include interviewer and respondent attitude to a long (probably seven-day) survey, as well as drop-out and nonresponse rates.

The implementation of a pilot survey to study these questions constitutes the first step toward the full-scale RHS. (The pilot survey will, of course, produce useful results and is therefore justified even if the full RHS is never carried out in Bolivia.) A sample design and total cost estimate for a major pilot survey (about \$200,000) as a methodological end in itself are presented in Mr. Losee's report. In view of the general usefulness for survey planning of a methodological pilot RHS carried out in Bolivia, it is suggested that the Nutrition Economics Group at OICD/USDA attempt to identify potential sources of funding and cooperate with the design of the study.

4. The Scaled-Down RHS

The purpose of the scaled-down RHS is to collect the minimum amount of information needed for descriptive characterization of rural expenditure and consumption patterns. Project duration is two years, from September 1, 1979 through August 31, 1981. See Garrie Losee's report on sample, mechanics of field work and cost break-down.

Information to be collected includes\*:

- purchases and subsistence consumption (the latter is analytically counted under purchases or expenditures; see Appendix 2 for definition of concepts). This information relates to consumer budgets. Expenditures on the farm operation (input purchases) are not considered.
- food consumption (ingestion).
- age/sex composition and other family characteristics.
- anthropometry (height, weight, arm circumference).
- employment.

All expenditure, consumption, and employment data will be asked by recall. The time reference for purchases and subsistence consumption of food is the three days preceding the interview. For less frequently purchased commodities, there are "past month" and "past twelve months" reference periods. The reference period for wage employment is the past week worked and for some questions the past 12 months. The reference period for actual consumption (ingestion) is 24 hours.

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\* LAC/DR/HN has inquired about the possibility to add a series of questions regarding people's health status. It is unclear at this time whether or not it will be possible to add some of these questions to the scaled-down RHS. I suggest that someone knowledgeable about public health investigations decide on, and formulate, the two or three most important questions (keeping in mind the need to minimize interviewing time), that they be added to the questionnaire for pretest purposes, and that a decision as to whether or not they should be retained be made after the pretest. The decision criterion will be the time required to ask the questions, given that survey priority is to study expenditure patterns.

A draft questionnaire, variable list, and explanations regarding data collection appear in Appendix 1.

## 5. Data Processing

Getting the various surveys of the Farm Policy Project processed is a major headache, and if past experiences can be extrapolated into the future, it will be years after completion of field work before the results of the RHS become available. As far as equipment is concerned, the capacity to process any or all of the Farm Policy surveys, including the RHS, exists at several computer centers in La Paz.\* Nevertheless, there are significant delays in processing the various surveys. (The RHS is the only survey under the Farm Policy Project which remains to be carried out in the field). Services rendered by CENACO have been particularly unsatisfactory. The PRODES survey, for example, took nine months to be entered into the system, even though the contract for the job called for it to be terminated in three months.

Reasons for the problem seem to include poor management, system failures, insufficiency of qualified programmer analysts, and, significantly, communications gaps between MACA and computer centers, since there are few individuals in the former institution who are knowledgeable about DP.

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\* Come December, 1979, a fresh addition to computing resources in La Paz will be INE's new DEC 20 computer [capacity: 256 k words; 2 disc drives; 2 (800/1600) tape drives; one (slow) printer]. INE is currently operating 10 data entry machines. With the new equipment, INE's computing capacity will be equivalent to CENACO's (data supplied by Mr. Lawrence Greenberg, INE).

What has to be done to avoid these pitfalls in the case of the RHS? It is desirable that data entry begin before the end of the year of field work, since the alternative of waiting until all questionnaires are returned implies that considerable time is wasted. Thus, RHS data entry should start about October 1980 (after two of the three survey periods are completed), which means that from the time of writing this report, there is a year left to plan for DP. Given the lack of progress in DP achieved locally, it would seem worthwhile to initiate discussions regarding the possibility to process the RHS at EUCEN. Also useful would be an evaluation by a DP specialist of bottlenecks as they relate to processing of the RHS at various centers in La Paz. With the progress made in designing the RHS and the draft questionnaire and variable list presented in Appendix 1, a major ingredient into such an evaluation --the DP demands of the RHS-- can now readily be quantified.

6. Future Activities Regarding the RHS

The bulk of this report has dealt with the identification of a manageable RHS version. The proposed product of this effort is the scaled-down RHS. Having determined the nature of the study, as well as its scope in terms of data collection, it is now possible to specify the next steps in RHS planning. There are six months to go until the scheduled questionnaire pretest (3 March 1980). Preparations include the following activities:

- questionnaire development;
- writing of questionnaire manuals and enumerator and supervisor training manuals;
- sample design and selection;

- hiring and training of supervisors who will carry out the questionnaire pretest and will train the enumerators;
- determination of desired characteristics of enumerators (see 1978 report for a beginning);
- determination of equipment needs (transportation, sleeping bags, flash lights, scales and meters for anthropometry, etc.);
- determination of DP demands and of computer center to carry out DP;
- advance work by a nutritionist regarding food composition tables and conversion factors\* (for both raw and cooked foods) to be used, and regarding food habits in various regions and typical household measures used, in order to create a basis for instruction of supervisors and enumerators.\*\* Mr. Losee's list of needed technical assistance, mostly involving the Bureau of the Census, should be augmented to allow for short-term cooperation by a

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\* to convert food "as purchased" into the edible portion.

\*\* the comprehensive table of commonly used cooking, serving and eating utensils (including volume and dimensions) prepared as part of the activities of the Cochabamba soybean project should be used as a starting point. The Cochabamba soybean promotion project is an on-going, joint endeavor between the Department of Nutrition of the University of North Carolina School of Public Health at Chapel Hill, N.C., and the Facultad de Ciencias de la Salud of Universidad Mayor de San Simón at Cochabamba. The soybean project included a sample study of household income and its determinants which is similar in scope to that of the large-scale RHS discussed above. Food consumption was assessed by means of the 24-hour recall method.

nutritionist. I regard a brief stint (possibly two weeks) by a nutritionist as essential, but instead of hiring a TDY, one of the highly qualified Bolivian nutritionists working on the soybean project might be contracted by the Mission for a short time to consult on the questionnaire and later the writing of enumerator training manuals and possibly enumerator training itself.

The questionnaire for the scaled-down RHS in Appendix 1 is a draft and is intended to serve as an initial document for discussion. All of the information needed from an analytical point of view is solicited by the current form of the questionnaire, but a lot remains to be done to improve and operationalize its lay-out and wording. It is suggested that BUCEN specialists review it from an operations and DP point of view. Their suggestions, as well as those of Bolivian counterpart at MACA and elsewhere, can then be incorporated this fall into a second version to be produced simultaneously with a detailed questionnaire manual.

1.4

Questionario

II. Composición Familiar

Cod	Nombre de la Persona 1	Relación JH 2	Fecha nacim. 3			Sitio de nacim. 4			Edad 6		Código	Sexo 8	Edo. Ci-vil 9	Educ. 10	Sigue estudiando? 11	Peso (Kg) 12	Talla (cm) 13	Circum. brazo (cm) 14
			Día	Mes	Año	Depto.	Cod	Prov.	Cod	#								
01																		
02																		
03																		
04																		
05																		
06																		
07																		
08																		
09																		
10																		
11																		
12																		
13																		
14																		
15																		

Col. 2, relación con JH:

- el mismo JH = 1
- esposa conviv. = 2
- hijo/hija del JH o esposa = 3
- padre/madre del JH o esposa = 4
- hermano/hermana del JH o esposa = 5
- otro lazo de parentesco = 6
- sin lazo de parentesco = 7

Col. 9, Estado civil:

- casado = 1
- soltero = 2
- conviviente = 3
- divorciado = 4
- viudo = 5

Col. 10, Educación

- ninguna = 1
- primaria = 2
- secundaria = 3
- superior = 4
- universitaria = 5

Col. 11, Sigue estudiando

- Sí = 1
- No = 2

Col. 7, UM = unidad de medida (día, mes, año)

Col. 8, Sexo  
 hombre = 1  
 mujer = 2









III. (fin)

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Costo de oportunidad											
					32						

52

IV. Consumo de Alimentos, últimas 24 horas

Número	Nombre de la comida		Hora	Plato	Ingredientes (Alimentos y bebidas)	Código alim. y bebidas		Origen alim.		Cantidad indicada	UM	Cantidad en Gramos	Otras partes	Factor Conversión	Parte Comestible (gr.)
	1	Cod				2	3	4	5						
1															
2															
3															

IV. (continuación)

Número	Nombre de la comida		Hora	Plato	Ingredientes (Alimentos y bebidas)	Código alim. y bebidas	Origen alim.		Cantidad indicada	UM	Cantidad en Gramos	Factor de conversión	Parte Comestible (gr)
	1	Cod					2	3					
4													
5													
6													
7													

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V. Fresencia de los comensales en las comidas del día anterior

	Cod.	Nombre de la persona 1	Edad 2	Sexo 3	Número de la comida							
					1 4	2 5	3 6	4 7	5 8	6 9	7 10	
Familiares	01											
	02											
	03											
	04											
	05											
	06											
	07											
	08											
	09											
	10											
	11											
	12											
	13											
	14											
	15											
Invitados	50											
	51											
	52											
	53											

Col. 2 : apuntar edad en años enteros

Col. 3: sexo: 1 = hombre  
2 = mujer









VII F. Gasto en bienes y servicios no comestibles.

Tipo de Gasto	Artículo	Código	Valor Pagado (\$b.)	Observaciones
Alquiler y servicios	alquiler			
	agua			
	electricidad			
	teléfono			
Combustible	gasolina			
	gas			
	kerosene			
	leña			
	carbón			
Servicio doméstico	empleados			
Ropa y mantenimiento				
Otros				

VIII. Gastos del hogar durante los 12 meses que precedieron la encuesta.

Tipo de Gasto	Artículo	Código	Valor Pagado (\$b.)	Observaciones
Amoblamiento y equipo del hogar				
Asistencia médica				
Educación				
Vehículos y viajes				
Gastos extraordinarios en construcción reparaciones, etc.				

Appendix 1

1. Questionnaire for the Scaled-Down RHS

1.1. Comments

The questionnaire contains eight parts:

- I Control data
- II Family composition
- III Employment characteristics
- IV 24-hour recall of food consumption
- V Meal attendance record
- VI 3-day recall of purchases and subsistence consumption
- VII 1-month recall of purchases of semi-durables and services.
- VIII 12-month recall of purchases of durables and other infrequent expenses.

The questionnaire should be organized such that the information can be punched directly from it, without having to be passed onto coding sheets prior to punching. I suggest the same design as has been used for the National Socioeconomic Farm Survey. One advantage of this is that the coding crew at MACA/Statistics already has experience processing this type of questionnaire. The form has a two-color lay-out. Information to be coded in the office is recorded by the enumerators in grey-colored boxes. It is coded onto adjacent white-colored boxes from which it is keyed. Coded information collected in the field is recorded in white boxes.

I. Control data: See MACA National Socioeconomic Farm Survey questionnaire and variable list below.

II. Family composition: The first person enumerated is the household head (JH = jefe de hogar). This person is coded as 01. This is usually a male, but in cases where he is absent or does not exist, the mother or any other pertinent person is considered JH. Families that do not have a defined JH are not interviewed.

Col. 1: Write down the name of the person.

Col. 2: Relationship to JH - to save space, the enumerator is to enter the information in coded form. See codes appended to Table II in questionnaire.

Col. 3: birth date. The order of data entry is day-month-year. Enumerators are assumed to be able to order the 12 months of year numerically. Correct entry of an October 2, 1940, birth date is 021040.

Col. 4, 5: enumerator to record department and province of birth, respectively. Coding done at office.

Col. 6, 7: age. Enumerator to record number and unit of measurement (days, months, years). Age to be recorded in days up to 30 days, in months up to 60 months, and in years from 60 months (5 years) onward. Coding done at office.

Col. 8: sex. Enumerator to record coded information. See codes appended to Table II.

Col. 9: civil status. Enumerator to record coded information. See codes appended to Table II.

Col. 10, 11: education; does person continue studying at time of survey? Same comment as Col. 9.

Col. 12: weight. Record in kgs. with 2 decimal places.

Col. 13, 14: height, arm circumference. Record in cm. (integers).

III. Wage Employment Characteristics: The objective of this section of the questionnaire is to obtain time and wage budgets of wage, or off-farm, employment. The incidence of wage employment is anticipated to be a prime determinant of consumption patterns. This information should, therefore, be of considerable classificatory value. The time spent in non-wage gainful activities (on-farm work, reciprocal labor exchange) can be derived from this information on the basis of assumptions regarding total number of hours or days worked per year. It is recognized that data on income derived from wage employment cannot be used to construct total income in the absence of data on other income sources. Nevertheless, the information is sought to create the possibility to study the characteristics of the rural wage sector and to differentiate between groups of people on the basis of their wage earnings.

An unanswered question in collecting labor use data is the length of the period to which queries regarding labor time and income should "ideally" refer. The appropriate reference period for analytical purposes is a year. But that is likely to be too long a period for people to remember exact time allocation and earnings. In small-sample labor use studies, families are typically revisited a number of times during the year and asked short-term recall questions referring to the past month or week. Repeat visits are beyond the scope of the scaled-down RHS. Hence, exact time and income

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data are asked regarding the most frequent full week of off-farm work, and indicative data regarding the same variables are solicited with reference to the 12 months preceding the survey.

The questions in Table III are asked of all family members eight years or older. In identifying family members who have been gainfully employed, the enumerator should use Table II as a guide in order to make sure that no family member is forgotten. The person codes in col. 2 of Table III refer to the same individuals they identify in Table II.

Col. 3: has (member) worked for someone else away from the family farm during the past 12 months? If yes, go to 4; if no, ask same of next person.

Col. 4: when was the most recent consecutive week during which (member) worked for someone else? (give date, i.e. month and year).

Col. 5: what activity did (member) spend most of his/her time doing during that week? (agricultural = 1; cattle raising = 2; mining = 3; handicrafts = 4; ambulant vending = 5; other (specify) = 6).

Col. 6: how many hours per day were spent on the activity during that week?

Col. 7: what was the form of payment? (cash = 1; kind = 2; cash and kind = 3).

Col. 8: how much did (member) earn in cash from that activity during that week?

Col. 9: what commodities were earned in kind? (fill commodity codes from left to right. There is space for a total of five. If number of cells exceeds commodity number, put zeros in remaining cells. Meals = 1; coca = 2;

alcohol and/or cigarettes = 3; food = 4; other (specify) = 5).

Col. 10: how much would have had to pay in order to buy the commodities received in kind? (give total).

Col. 11: did (member) carry out any other wage activities during that week? If yes, go to 12. If no, go to 19.

Col. 12: what were these activities? (use same codes as col. 5. Fill activity codes into cells from left to right, putting down zero's when cell number exceeds activity number).

Col. 13: how many days were spent on these activities during that week? (give total of all activities).

Col. 14: how many hours per day were spent on these activities during that week? (give total of all activities).

Col. 15, 16, 17, 18: same as col. 7, 8, 9, 10, respectively (lump activities together).

Col. 19: what was (member's) main wage activity during the year (12 months) preceding the survey? Same codes as col. 5. The main activity is that from which most income is earned.

Col. 20: during what months did (member) work in this capacity part-time or full-time? January = 01; December = 12. Fill number of month worked from left to right, beginning with the 1st month preceding the interview and ending with the 12th month preceding the interview. Put down zero's for months not worked.

Col. 21: how many days did (member) work in this capacity during each of the months indicated?

Col. 22: what was the form of payment during each month (member)

worked in this capacity? If cash, or cash and kind, go to 23; otherwise go to 24.

Col. 23: what was the daily wage (jornal) received during each of the months (member) worked in this capacity?

Col. 24: what would it have cost to buy the commodities received as payment in kind during each of the months (member) worked in this capacity?

Col. 25: where did (member) carry out this occupation? (immediate neighborhood = 1; same canton of residence, but beyond immediate neighborhood = 2; different canton, but same province = 3; different province, but same state = 4; different state or country = 5).

Col. 26: for whom did (member) do this work? (private employer = 1; government = 2; cooperative = 3).

Col. 27: what was (member's) second-most important wage activity during the year (12 months) preceding the survey? (same codes as col. 5).

Col. 29: how many days did (member) work in this activity during each of the months indicated?

Col. 30: what was the form of payment during each month (member) received for this activity? If cash, or cash and kind, go to 31; otherwise go to 32.

Col. 31: what was the daily wage (jornal) received during each of the months (member) worked in this capacity?

Col. 32: what would it have cost to buy the commodities received as payment in kind during each of the months (member) worked in this capacity?

IV. 24-hour recall of food consumption: This information is asked of the mother or female head of household. All meals and snacks consumed during the 24 hours preceding the interview, whether consumed by the family as a whole or only by certain family members, are to be recorded in Table IV.

Col. 1: name of meal. Write down the local denomination of each meal (breakfast, lunch, etc.). Coding done at office.

Col. 2: record the hours the meal was taken (use military denominations, i.e. 0800 or 1400).

Col. 3: record the dish or combination of food and beverages consumed.

Col. 4: specify all ingredients into meals or snacks. It is of vital importance that the enumerator probe adequately to obtain such easily forgotten ingredients as oil and fat, spices, salt, etc. Write down one ingredient per horizontal line.

Col. 5: food codes recorded in office.

Col. 6: origin of foods. Codes are: subsistence production = 1; purchased = 2; donated = 3; bartered = 4; other = 5(specify).

Col. 7, 8: quantity as reported. This column is reserved for information reported in terms of household measures (UM = unidad de medida,

measuring unit). Household measures include units (1 apple, etc.), cups, spoons, sacks, pots, etc. The enumerators will be given a chart of standard household measures (with pictures), including their usual volume. When household measures are reported, the enumerator records them in col. 7 and 8 and writes in col. 9 the equivalent in grains. If utensils of non-standard size are reported, the enumerator is to estimate their size and volume relative to standards.

Col. 10: food quantities are to be reported in raw form. If for some reason this is not possible, this must be recorded in column 10 by inserting the code 1.

Col. 11: conversion factor to transform the weight "as purchased" which appears in col. 9 into the edible portion. Average, published conversion factors will be used. This is part of coding and is done at the office.

Col. 12: the raw edible portion of foods is entered at the office. It is the product of col. 9 times col. 11.

V. Meal attendance record: The purpose of this table is to develop the information to calculate per capita (or per consumer unit) intake and to properly weight requirements for energy and nutrients. (See 1978 report for a technical discussion of procedures). The person codes for family members in Table V must identify the same persons as in Table II, such that their age/sex characteristics can be retrieved. There are codes for guests who may have been present at the meals (codes 50 and up; see Table V). Age and sex information is required of guests (col's 2 and 3 in Table V).

The Table (col's 4 through 10) is filled by assigning code 1 to any cell identified by a particular meal and family member or guest, if the person has participated in the meal. In the opposite case, the corresponding cell is assigned the code 0 (zero).

VI. Three-day recall of purchases and subsistence consumption:

Col's 3, 4, 5, etc. of Table VI A.: as in Table IV, the quantity information is first recorded in local or household measurement units and subsequently converted to the metric system (grams ).

Col. 7 of Table VI A: of the three elements quantity, value, and unit price, any two are needed to determine the third. Asking respondents to report all three elements is redundant in terms of information, but may serve as a memory aid.

Col. 18: frequency of purchase. Codes are: daily = 1; weekly = 2; biweekly = 3; monthly = 4; less than monthly = 5.

Col. 19: type of retail establishment where purchased. Categories (not definitive) include: market (fair) = 1; tienda = 2; vendedor ambulante = 3, supermercado = 4.

VIB. Subsistence consumption during second and third day prior to the interview (the subsistence consumption on the day immediately preceding the interview is already accounted for in the 24-hour recall, Table IV):

It may be necessary to break Table VIB. down by meals. This should serve as a memory aid.

Col. 6, 10: the imputed value of subsistence consumption is calculated and recorded in the office.

VIC. Nonfood purchases during the week preceding the interview:

This table is as yet incomplete in that it does not contain a list of frequently purchased commodities. Such a list (to appear in the left-most column under "artículos") is thought to be necessary as a memory aid and interview guide to both the enumerator and the respondent.

The principal commodities to be listed here include expenditures on transportation, small household appliances, fuel, recreation, medical expenses, consumer articles (soap, combs), etc.

VII. One-month recall of expenditures on semi-durables, services, and infrequently purchased foods (oil, sugar, salt).

VIII. Twelve-month recall of expenditures on durables and other infrequent expenses.

Tables VII and VIII contain a breakdown of frequent expenditure items, which is, however, preliminary and must be subject to further scrutiny for completeness and appropriateness.

Food commodities accounted for in Table VII are not the same that appear in Table VIA.

1.2 Variable list (family level)

a) Observed variables (directly keyed from survey form)

<u>Topic</u> *	<u>Var. No.</u>	<u>Format</u>	<u>Descriptive var. name</u>
I	001	F4.0	No. of case
	002	F3.0	Dept.
	003	F3.0	Prov.
	004	F3.0	Cantón
	005	F4.0	No. Segment
	006	F6.0	Date first visit
	007	F1.0	Number of visits
	008	F2.0	Enumerator code
	009	F2.0	Supervisor code
	010	F1.0	Interview successful/reject
	011	F3.0	distance to town most frequently visited (km).
IV	012	F1.0	meal number

012 occurs 7 (questionnaire space allows for 7 meals, incl. snacks).

013	F4.0	food code
014	F1.0	food origin
015	F4.0	food qty "as purch." (gr.)
016	F4.0	food qty "edible" (gr.)

013 through 016 occur 7 x 15 (maximum of 7 meals with maximum of 15 foods each).

VIA.	017	F.40	food code
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017 occurs 15 (questionnaire allows for maximum of 15 items in Table VIA.)

\* refers to the chapters of the questionnaire.

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<u>Topic</u>	<u>Var.No.</u>	<u>Format</u>	<u>Descriptive var. name</u>
	018	F4.0	quantity purchased (gr.)
	019	F4.0	Amount paid (\$b.)
	020	F5.1	price per kg. (\$b.)
	018 through 020 occur 3 x 15 (for 3 days and a maximum of 15 food items each day).		
	021	F1.0	frequency of purchase
	022	F1.0	vending establishment
	021 through 022 occur 15 (for maximum number of 15 food items).		
VIB.	023	F4.0	food code
	? (023 occurs 15)		
	024	F4.0	quantity consumed (gr.)
	025	F4.0	imputed value (\$b.)
	024 through 025 occur 2 x 15 (2 days and 15 commodities at most).		
VIC.	026	F4.0	commodity code
	027	F5.0	amount paid (\$b.)
	028	F1.0	cash or credit
	026 through 028 occur 15 (for maximum number of 15 commodities).		
VIIA.	029	F4.0	commodity code
	030	F4.0	quantity purchased (gr.)
	031	F5.0	amount paid (\$b.)
	032	F5.1	unit price (\$b.)
	029 through 032 occur 15 (for maximum of 15 food commodities).		

<u>Topic</u>	<u>Var. No.</u>	<u>Format</u>	<u>Descriptive variable name</u>
VIIIB.	033	F4.0	commodity code
	034	F5.0	amount paid (\$b.)
	033 through 034 occur 20 (for a maximum of 20 commodities).		
VIII	035	F4.0	commodity code
	036	F6.0	amount paid (\$b.)
	035 through 036 occur 20 (for a maximum of 20 commodities).		

b) Calculated variables include:

- family size (no. of members)
- family size (adult equivalents)
- average family per capita requirement for calories and nine nutrients.
- daily consumption of individual foods, by origin (purchased vs. subsistence), expressed in quantity, monetary, and calorie and nutrient terms.
- yearly purchases of all expenditure items (food and nonfood) accounted for in parts VI through VIII of questionnaire.
- total expenditures
- total wage income
- etc.

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1.3 Variable list (individual level)

a) Observed variables (directly keyed from survey form)

<u>Topic</u>	<u>Var. No.</u>	<u>Format</u>	<u>Descriptive variable name</u>
II	001	F2.0	code of farm member
	002	F1.0	relationship to head of hh
	003	F6.0	birth date
	004	F3.0	Dept. of birth
	005	F3.0	Prov. of birth
	006	F3.0	age
	007	F1.0	sex
	008	F1.0	civil status
	009	F1.0	education
	010	F1.0	does person continue studying
	011	F5.2	weight (kg.)
	012	F3.0	height (cm)
	013	F2.0	arm circumference (cm)
001 through 013 occur n times, for n family members (questionnaire allows maximum of n = 15).			
III	014	F2.0	code of worker
	015	F1.0	worked/didn't work
	016	F4.0	date most recent work week
	017	F1.0	type of job
	018	F2.0	hours per day
	019	F1.0	form of payment
	020	F4.0	cash salary (\$b.)
	021	F5.0	commodities earned

<u>Topic</u>	<u>Var. No.</u>	<u>Format</u>	<u>Descriptive variable name</u>
	022	F4.0	opportunity cost
	023	F1.0	did/did not do other work
	024	F4.0	types of jobs
	025	F1.0	number days worked
	026	F2.0	hours per day
	027	F1.0	form of payment
	028	F4.0	cash salary (\$b.)
	029	F5.0	commodities earned
	030	F4.0	opportunity cost
	031	F1.0	main activity
	032	F12.0	months worked
	033	F24.0	days worked each of 12 months
	034	F12.0	form of payment each of 12 months
	035	F48.0	cash salary each of 12 months (\$b.)
	036	F48.0	opportunity cost each of 12 months
	037	F1.0	job location
	038	F1.0	type of employer
	039	F1.0	second activity
	040	F12.0	months worked
	041	F24.0	days worked each of 12 months
	042	F12.0	form of payment each of 12 months
	043	F48.0	cash salary each of 12 months (\$b.)
	044	F48.0	opportunity cost each of 12 months

014 through 044 occur m times, for m workers

(questionnaire allows maximum of m = 6).

<u>Topic</u>	<u>Var. No.</u>	<u>Format</u>	<u>Descriptive variable name</u>
V.	045	F2.0	code of family member
	046	F7.0	meal attendance record

045 through 046 occur n times, for n family members (maximum n = 15).

047	F2.0	code of guest .
048	F2.0	age (years)
049	F1.0	sex
050	F7.0	meal attendance record

047 through 050 occur t times, for t guests (maximum t = 4).

b) Calculated variables include:

daily per capita energy and nutrient requirements.

## Appendix 2

### Large-Scale Monitoring of Household Expenditures and Consumption in Rural Bolivia: A Methodological Note

The collection of quantitative data on family purchases and consumption is costly and places a considerable burden on enumerators and respondents alike. The identification of efficient procedures to measure the concepts to be studied is therefore of prime interest in survey design. In this appendix, the principal "dependent" variable in the Bolivian RHS (purchases, consumption, nutrition) are defined and alternative measurement methodologies are discussed. The discussion is primarily intended as a background statement to the suggested pilot survey for the full-scale RHS. It has less relevance for planning of the scaled-down survey, since no testing of alternative methodologies is envisaged there.

Purchases are defined as expenditures on food and nonfood commodities incurred by the household during a specified period of time. In order to permit the analysis of actual demand, purchases of food are monitored by the RHS not only in monetary, but also in physical quantity (kgs) terms. Food "purchase" include subsistence, or home-grown, produce, as well as food obtained through barter. Subsistence and bartered produce is valued at locally and seasonally prevailing market prices. Thus, food can enter the household through a variety of avenues. True purchases, subsistence and barter are the three major food sources in the rural household. Gifts and donations constitute a fourth source which is, however, not counted under "purchases," since the inflow of donated food into the household is not associated with a commensurate outflow of money or produce or the application of labor and other inputs to family farm land. Donated food is not an

analytical category in the analysis of household budgets. But the quantities of it which enter the household must be measured because of their impact on consumption and nutrition.

Consumption is the use made in the household of commodities purchased or otherwise obtained. By food consumption we mean ingestion, i.e. purchases (including subsistence and bartered produce) plus donations minus waste, inedible portions, and leftovers. The weight "as purchased" of a food item is its gross weight which includes both edible and inedible parts of the commodity. The edible portion (net weight) equals the weight "as purchased" minus inedible or customarily uneaten components (bones, peels, excess fat). The actual intake (consumption, ingestion) equals the edible portion minus waste and leftovers.

Whereas physical quantities of purchases and consumption are both observed in the field, nutritional intake is calculated in survey headquarters as the sum of the food energy and nutrients contained in the consumed quantity of individual food items.\* The contribution of each food commodity to total nutritional intake is assessed via the multiplication of the quantity consumed of the commodity by its unit energy and nutrient content, where the latter is derived from direct chemical analysis of an aliquot or (more frequently) from published food composition tables.

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\* In the case of household budget surveys which only record purchases, nutrient values are sometimes calculated for these data after transforming food "as purchased" into "edible portions" on the basis of average, published conversion coefficients.

(There exists a composition table for the principal Bolivian foods which can be supplemented by the FAO composition table for Latin America.) Nutritionists are interested in both the relative contribution of key commodities to total nutritional intake, and apparent nutritional status (as well as the incidence of nutritional deficiencies) determined by means of the qualified comparison between total intake of calories and nutrients, on the one hand, and "requirements" for these nutritional principles, on the other.

Purchases and consumption can be self-enumerated (diary), or they can be recorded by an interviewer. As stated in the 1978 report, self-enumeration (not infrequently practiced in household budget studies in developed countries) is considered to be unacceptable for the purposes of the RHS because of the high prevalence of illiteracy and the relatively undeveloped communications network in rural Bolivia. All data must be recorded by enumerators in direct interviews with the respondents.

With either type of enumeration, purchases and consumption can furthermore be monitored by recall: (past purchases and consumption) or by direct observation and recording. Nutritionists distinguish between the quantitative and the qualitative recall. (Most food recall enumeration refers to the 24 hours preceding the interview). In the first type of recall interview an attempt is made to obtain actual quantities of foods purchased and/or consumed. Respondents are usually asked to express volumes in terms of common household measures (spoons, cups, sacks). Average, published coefficients are used to convert total food to the edible portion. In the second type of recall interview, qualitative

information regarding direct composition and the frequency of consumption of various food commodities is sought. This information is adequate to test certain hypotheses regarding family or community food behavior, but does not permit evaluation of purchases, consumption and nutritional status. Hence, only the quantitative recall is of interest as a potential data collection procedure in the case of the RHS.

Direct recording may take the form of rigorous weighing of gross and net quantities, as well as waste and leftovers, or it may consist of the quantification of purchases and consumption by estimating for all foods the number of household measures of known volume filled.

There are two fundamental and interdependent methodological questions regarding how "best" to obtain quantitative information on household\* purchases and consumption:

- 1) Should food commodities be enumerated by recall, weighing, or current observation in terms of household measures?
- 2) During how many days should purchases and consumption be observed in each household?

The answer to the first question depends on the relative accuracy of the three measurement procedures which must be judged in relation to survey objectives. The second question arises from the often observed circumstance that people subject to an expenditure survey change their normal behavior as consumers during the first day or days of the study.

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\* It is not recommended that individual consumption data be collected in the RHS as a whole, but intra-family food distribution might be studied on the basis of a small subsample of RHS or other families.

Reasons for this usually include the desire to impress the enumerator by consuming commodities thought to be particularly prestigious, and/or the desire to avoid burdensome enumeration by simplifying consumption patterns. One-day expenditure surveys are therefore generally not considered to be very reliable. Data accuracy increase with survey duration, because people "get used" to being enumerated and, if they are poor, they are unable to live beyond their means for more than a day or two. On the other hand, there is a point at which respondent patience with the survey and the presence of the enumerator begins to falter, which is expected to have negative implications for data quality. Hence, the determination of appropriate survey duration is an important component of survey planning. Cost considerations and the intention to avoid excessive taxing of respondent readiness to cooperate call for a deliberate attempt, in survey planning, to minimize survey duration subject to the constraint of specified desired data accuracy.

In the case of the RHS, the decision regarding appropriate survey duration is complicated by the circumstance that the optimum observation period is not necessarily the same for the study of consumption as it is for that of purchases. Consumption patterns among the poor are often monotonous and hence can be monitored in little time (for example, three days). On the other hand, the very poverty of many of the families that will be selected as part of the RHS sample, and the irregularity of their cash income stream, imply that their purchasing patterns are irregular and that volumes bought on the occasion of any one "shopping trip" are very small. Thus, purchases may be more completely observed by a relatively

long, for example, seven-day survey.

Most expenditure - consumption surveys last from three to seven days, with the latter being more frequent, to my knowledge, than the former. (Large-sample, seven-day surveys have been carried out during the 1970s in Brazil, Perú, Liberia and several other developing countries. The most well-known seven-day (panel) survey in developed countries is the British National Food Survey).

The optimum survey period is not independent of the procedure adopted to measure purchases and consumption. The relative standard error of quantities observed, a frequently used statistic to evaluate data reliability, cannot be expected to be the same for different durations of the same measurement method. Because there are limits to human memory and because it is desirable that the enumerator be able to verify respondent information, direct observation is ideally preferred over recall. Moreover, weighing is preferred over estimation by household measures. However, there are numerous inherent difficulties in measuring food consumption and a "reference method that yields absolutely true results does not exist" (Burke and Pao, 1976:42). It is, therefore, indispensable in survey planning to carry out a pilot survey to test the relative accuracy of data obtained by various methods and observation periods. Prior to formulating an appropriate set of different approaches to be evaluated, the pertinent criteria and ways to express them (where not obvious) are identified.

Burk and Pao (ibid, pp. 14-19) list the following five considerations in evaluating alternative survey methods: reliability and validity of the food measurements obtained, the burden on respondents, costs of field work and DP, and -- to paraphrase their last factor -- appropriate data accuracy for given analytical needs. The latter criterion points to the need to use data collection methods which will produce the "right" data accuracy. Assume, for example, that it has been decided to collect consumption data via the 24-hour recall method, and that the only question to be resolved is the number of days during which the recall should be administered. As pointed out by Dr. Joseph Edozien of the Department of Nutrition of the North Carolina University School of Public Health (Chapel Hill, N.C.)\*, many recall food intake studies have found no significant difference in mean intake between one and two or three day surveys. As is to be expected, however, the range and variance of intake vary greatly with the length of survey period. Their tendency is to decline and to assume increasingly realistic values as the survey period increases. While on any given day an individual's intake may be zero or it may be very high in response to unusual energy expenditure, a "normal" food consumption pattern with lower variability is detected over a period of several days. If, however, the researcher is only interested in mean intake, he or she would be ill advised spending the additional resources that are required to extend the study to more than one day.

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\* personal communication, La Paz, Bolivia, 1979.

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Reliability means reproducibility or repeatability, \* whereas validity refers to the degree to which the actual measurements of consumption respond to the analytical concepts one attempts to measure. Reliability relates to sampling and the "ability of the respondents to provide reliable data" (ibid, p. 15). The quantification of sampling error is relatively straightforward; that of respondent error is much more difficult. Ideally, the reliability of a method to measure food consumption would be tested by comparing the results of repeated measurements on the same household under the same circumstances. However, within-individual or within-household variation from assessment to assessment can hardly be controlled and the portion of variance that is accounted for by it cannot be distinguished from that introduced by measurement unreliability. Attempts to measure the relative respondent error component that is associated with alternative measurement methods include the comparison of means, ranges, and percentage standard errors, whereby it is implicitly assumed that the variability in consumption behavior of the measured entity (individual, household) is zero, or at least, "small."

Validity criteria include whether or not respondents alter their food patterns for the sake of the survey, to what extent it is possible to weigh or otherwise enumerate actual quantities purchased or ingested, given the complications presented by packaging, inedible portions, and waste and leftovers, and to what extent it is possible to quantitatively disaggregate mixed dishes into their components. As in the case of re-

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\* This portion closely follows Burk and Pao (ibid).

liability, the validity of a method is usually assessed in relative terms, by comparing the results with those obtained by alternative methods. Another approach, feasible where the problem is to assess the validity of a method to determine energy intake, is to compare intake with requirements. Because of the possibility of overeating and undereating, this is, however, crude, since it permits detection of error only at the extremes, i.e. if measured intake is below or above biologically reasonable limits. A further approval to assessing validity is to relate food consumption behavior to socio-economic factors and to determine, for example, whether or not the data bear out Engel's law (the proportion of income spent on food declines as income grows) or Bennett's law (the proportion of starchy staples to total food declines as income grows).

As suggested earlier, the evaluation of alternative data collection procedures in a pilot RHS in Bolivia should only deal with methods that involve enumeration by an interviewer. If all that is to be identified is the appropriate survey duration, then data are collected by a given method during seven days and the results are compared after one day, two days, three days, etc. (Seven days is taken as the top duration because of cost considerations, although consumer expenditure surveys implemented in the U.S. and elsewhere have lasted longer). One sample of "pilot" households is needed in this case. However, if one wants to test not only duration, but also alternative methods, it is necessary to select several pilot samples. The same information cannot be collected more than once simultaneously in the same household. Because of intra-household variability through time, collecting the same information in the same household by means of different methods at different times may not be better than simultaneously collecting

the same information by different methods, all of which, to be sure, are selected such as to be as homogeneous as possible with respect to their characteristics that determine food behavior. An advantage of the latter approach is that the pilot study can be carried out in one week rather than having to be extended over a period of several weeks.

The Bolivian pilot RRS must be based on several samples selected with this criterion in mind, since both methodology and survey duration must be tested. The objective of the survey is to evaluate the relative reliability, validity, respondent burden, and field and processing costs of information on purchases and consumption obtained by variable duration of weighing, direct - observation estimation via household measures, and recall via household measures. Purchases and consumption obtained by weighing and direct observation via household measures, and consumption obtained by 24-hour recall are to be monitored during a full week. Monitoring purchases by 24-hour recall during seven days is probably not meaningful, since people do not buy food every day in the rural areas. Instead, it is suggested that recall data on purchases be asked with respect to alternative reference periods, i.e. the past week versus the past month.

This requires three samples of households: one for seven days of observation by weighing (where the results are analyzed and compared day-by-day), one for seven days of observation via household measures, and one to be split into two sub-samples in both of which consumption is observed during seven days by means of the 24-hour recall method and purchases are obtained by means of past-week and past-month recalls, respectively.