

October 1991

91-18



Working Papers in  
**Agricultural  
Economics**

**Rural Household Data  
Collection in Developing  
Countries:**

Designing Instruments and  
Methods for Collecting  
Off-Farm Income Data

Julie P. Leones and Scott Rozelle



DEPARTMENT OF AGRICULTURAL ECONOMICS AND  
CORNELL FOOD AND NUTRITION POLICY PROGRAM

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

**RURAL HOUSEHOLD DATA COLLECTION IN DEVELOPING COUNTRIES:  
DESIGNING INSTRUMENTS AND METHODS FOR  
COLLECTING OFF-FARM INCOME DATA**

**Julie P. Leones\***  
**Scott Rozelle\*\***

---

\* Presently an Extension Specialist at the Department of Agricultural Economics, The University of Arizona.

\*\* Presently an Assistant Professor at the Food Research Institute, Stanford University.

This paper was made possible by the cooperative efforts of Per Pinstруп-Andersen, Director of the Cornell Food and Nutrition Policy Program (CFNPP), and William Tomek, Chairman of the Department of Agricultural Economics, Cornell University. The author would like to thank both for financing the editing, production, and printing of this working paper.

The Department of Agricultural Economics at Cornell is concerned with economic issues in agriculture, natural resources and the environment, and rural communities. It is a unit of the College of Agriculture and Life Sciences. The Department strives for excellence in all functional areas (teaching, research, and extension), and departmental programs benefit from associations with other departments and programs on campus, such as CFNPP (see below). Working Papers are manuscripts which are subject to revision, and comments and suggestions are welcome. Nonetheless, these papers are intended as up-to-date reports of research and scholarly activities within the Department.

The Cornell Food and Nutrition Policy Program (CFNPP) was created in 1988 within the Division of Nutritional Sciences to undertake research, training, and technical assistance in food and nutrition policy with emphasis on developing countries. CFNPP has an advisory committee of faculty from the Division of Nutritional Sciences, College of Human Ecology, the Departments of City and Regional Planning and Rural Sociology; the Cornell Institute for International Food, Agriculture and Development; and the Department of Agricultural Economics and the International Agriculture Program. Graduate students and faculty from these units sometimes collaborate with CFNPP on specific projects. The CFNPP professional staff includes nutritionists, economists, and anthropologists. CFNPP work on these papers was supported by USAID Cooperative Agreement No. DSAN-1064-A-00-5092-00.

Agricultural Economics Working Papers can be ordered from

Publications/Mail Room  
Department of Agricultural Economics  
52 Warren Hall  
Cornell University  
Ithaca, NY 14853  
607-255-2101

The series of CFNPP Working Papers and this series of seven papers on collecting rural household data in developing countries also may be obtained by contacting

CFNPP Publications Department  
1400 16th Street NW, Suite 420  
Washington, DC 20036  
202-822-6500

## CONTENTS

<b>ABSTRACT</b>	v
<b>FOREWORD</b>	vii
<b>1. INTRODUCTION</b>	1
<b>2. CONCEPTUAL ISSUES</b>	4
Defining Income	4
Accounting for Investments	5
Privacy and Respondent Recall	6
Valuation of Nonmarket Goods and In-Kind Transfers	7
<b>3. METHODS</b>	8
Interviewing Key Informants and Observation	8
Recordkeeping	9
Survey Interviews	10
<b>4. ORGANIZATIONAL ISSUES</b>	14
<b>5. CONCLUSIONS</b>	15
<b>Appendix A</b> – Initial Interview on Logging in a Philippine Village	16
<b>Appendix B</b> – Initial Interview on Rice Harvesting Arrangements	17
<b>Appendix C</b> – Original Off-Farm and Nonfarm Income Recordkeeping Form from the Philippine Study	18
<b>Appendix D</b> – Modified Recordkeeping Forms for Nonfarm and Off-Farm Income	19
<b>Appendix E</b> – Example of Survey Form for Enumerator (Nonfarm and Off-Farm Income)	25
<b>Appendix F</b> – Supplemental Noncropped Agricultural Form (Construction Industry Job)	27
<b>Appendix G</b> – Supplemental Noncropped Agricultural Form (Factory Job)	28

Appendix F	- Supplemental Noncropped Agricultural Form (Construction Industry Job)	27
Appendix G	- Supplemental Noncropped Agricultural Form (Factory Job)	28
Appendix H	- Supplemental Noncropped Agricultural Form (Fishing Industry)	29
REFERENCES		33

## ABSTRACT

This paper describes the importance of data on off-farm and nonfarm income in calculating total household income, the relative importance of different income sources, and the opportunity costs of family labor. Difficult conceptual problems include defining income, accounting for investments, valuation of nonmarket goods and in-kind transfers, and assuring confidentiality. A useful preliminary step in gathering off-farm and nonfarm income data is to interview key informants and observe actual enterprises using survey interviews or records kept by respondents. Information that is often neglected but necessary includes cost of capital, differences in technologies, commuting and other transaction costs, and conversions for local units of measure.

## FOREWORD

This paper is one in a series of seven working papers on collecting rural household data in developing countries. Between late 1986 and early 1988, six Ph.D. candidates from Cornell's Department of Agricultural Economics left to do the fieldwork in developing countries for their dissertations. Upon returning to Cornell in 1989, they discovered that they shared common experiences and frustrations while collecting household-level data for analyzing applied economic problems in developing countries. This series of working papers is the result of their collective effort to help other researchers avoid common pitfalls and build upon their experiences.

The working papers provide a practical field guide – for use together or separately – for individuals collecting a wide range of household information in developing countries. Each paper introduces the conceptual and practical difficulties involved in making different types of measurements or collecting different types of information. The guide is intended to provide readers with enough information about various methods so that those best suited to an individual's needs can be selected. Therefore, a variety of methods for collecting data are reviewed and the consequences of choosing one method or another are discussed.

Each working paper is organized into a section on conceptual issues, followed by a section on methods and organization. Conceptual issues address problems that researchers encounter when they move from a discipline's theory to empirical investigation. Often these include defining or measuring dynamic concepts or institutions such as the household, farm unit, time, or the valuation of goods. Related to this is evaluating whether or not to use certain variables in measuring rural lifestyles. In attempting to quantify particular aspects of rural economies, researchers realize that their definitions of selected variables do not always suit the reality of village economies. Thus, the sections on conceptual issues address the need to reconcile the researcher's theory and preconceived ideals with the realities of the survey site.

Although the related literature is reviewed in each working paper, the primary source of information has been the collective research experience of the authors. Examples of field experiences illustrate points made in each working paper. Many items that the authors felt they would have benefited from are included as well.

The target audiences are graduate students and other researchers, academicians, consultants, government employees, members of private voluntary organizations, etc., who are interested in collecting high quality socioeconomic, nutrition, and health data related to rural households in developing countries. In particular, the guide is for individuals who may not have had much prior experience in collecting this type of data, who may not have access to other current written material on data collection methods, or who may have some experience, but may not be aware of recent developments in data collection methodology.



One unique aspect of the series of working papers is its attempt to provide many examples of survey forms that have actually been used in field projects. Each working paper is built around the following question: How can survey forms and record keeping instruments be designed to assist the researcher in collecting high quality, nondistorted, less systematically error-filled data? Frequently, two or more forms that were used in different surveys (or in different rounds of the same survey) are discussed. The author has tried to be frank and honest, frequently providing criticisms of forms or tables that they used, but with which they failed to achieve the intended results.

Finally, a brief word on the use of 'he' and 'she' throughout the collection of working papers. Since the group of authors was equally divided into three men and three women, as a convention, generic third person pronouns and possessives (he, she, him, her) were consistent with the author's gender and should not be interpreted as a violation of political correctness.

The working paper series includes:

<b>Paper Subject</b>	<b>Series Number</b>	<b>Author</b>	<b>Author's Country of Study*</b>
Collecting General Household Information Data	91-13	Krishna P. Belbase	Nepal
Collecting Consumption and Expenditure Data	91-14	Carol Levin	Indonesia
Collecting Health and Nutrition Data	91-15	Jan Low	Northern Malawi
Collecting Time Allocation Data	91-16	Julie P. Leones	Philippines
Collecting Farm Production Data	91-17	Scott Rozelle	China
Collecting Off-Farm Income Data	91-18	Leones & Rozelle	Philippines, China
Preparing the Data for Analysis	91-19	Tom Randolph	Southern Malawi

\* Each paper includes examples from other studies along with those from the author's country of study.

October 1991

Carol Levin and Scott Rozelle  
Series Coordinators

## 1. INTRODUCTION

Although agriculture is often the most important source of income in rural communities in developing countries, it is not the only source of income. The importance of off-farm and nonfarm income in rural economies is gaining wider recognition (Anderson and Leiserson 1980; von Braun 1989; Shand 1987; Syed 1987). Chuta and Liedholm (1979) estimated that one-fifth or more of the rural labor force in developing countries was primarily engaged in nonfarm activities in the 1970s, that well over one-fifth of total rural household income came from nonfarm sources, and that nonfarm income and employment were growing faster than agricultural income and employment. In some areas, nonfarm sources of income contribute significantly to total rural income and are becoming increasingly important to farm families in many developed and developing countries (Findeis and Reddy 1987; Besteman 1989; von Braun 1989).

Despite current interest, few studies on nonfarm and off-farm income are available. Many researchers are interested in off-farm and nonfarm income because they wish to derive total household income. These researchers might consider monitoring expenditures instead of attempting to directly monitor income by source (see Working Paper 91-11 on Expenditure and Consumption). Others want a better sense of the relative importance of various sources of income and the demands on the household's resource base of each of these sources. Some studies may be focusing on a particular nonfarm or off-farm enterprise. The techniques presented in this chapter are likely to interest this group of researchers. The chapter, however, will also address methods for collecting information that are less rigorous for studies that want data on off-farm activities but may not want the detail provided by more intensive techniques.

Researchers interested in both production and consumption collect supplemental data on nonfarm and off-farm income. Such income not only affects consumption and expenditure levels of a household, but may also affect farm operations by making available additional capital or by providing alternative uses for family labor and hence affecting the opportunity cost for family labor. Furthermore, the existence of households with nonagricultural income sources is not unusual. In many rural communities, off-farm and nonfarm employment is the rule rather than the exception. In China, over 95 percent of the household have nonagricultural sources of income. Similar levels were found in Indonesia, the Philippines, and Nepal.

Data on nonfarm and off-farm income not only help determine the composition of total household income, but they help determine the degree of diversification and specialization within communities as well. Low- and middle-income households are often involved in a wide range of different economic enterprises. In the Philippines, families are involved in an average of 11 different enterprises

(including individual crop and animal enterprises such as rice production and hog raising, etc.). Reliance on a large number of different income sources is not unusual in rural areas; in fact, reliance on full-time permanent employment is more unusual. Without data on these activities, it is difficult to determine the relative importance of agricultural income.

Nonfarm and off-farm income data are also being collected to analyze differences in family livelihood patterns and strategies and in examining the distributional impact of income by source, particularly of remittance income (Leones 1991a; Stark, Taylor, and Yitzhaki 1986), but also of nonfarm income (Shand 1986; Boisvert and Ranney 1987; Chinn 1979; Findeis and Reddy 1987; Leones 1991b and 1990). Examining the changes in particular nonfarm and off-farm enterprises over time is also important in the studies of technological change, risk, and uncertainty (Kyle 1990), the impact of rural electrification and improvements in rural transportation and communication and in studies on community economic development. Finally, nonfarm and off-farm income data when combined with time allocation or labor data are useful in comparing returns to individual enterprises, in comparing returns to the agricultural and nonagricultural sectors of rural economies, and in examining opportunity costs of family labor (Low 1981; Chinn 1979; Rief and Cochrane 1990). Development of effective rural policies requires an understanding of off-farm and nonfarm activities.

One reason for the lack of studies in this area is that many field researchers are uncomfortable collecting data on enterprises about which they know little. There is no real substitute for taking time to understand the technology of these enterprises. However, in some highly diversified rural economies it is impossible to be technically knowledgeable in all activities. It is still possible to collect good quality data on such enterprises using techniques that will be discussed later in the chapter.

Although "off-farm" is broadly used to mean any economic activity off of the farm, it is often used to refer specifically to *agricultural sources* of income from enterprises off of the family's own farm. Examples of off-farm sources of income include both earned income from agricultural day labor, harvest contracts, enterprises that utilize agricultural by-products, and income received from productive agricultural assets, such as land rental, machinery rentals, etc. Off-farm will be used in this more narrow sense for the remainder of the chapter.

Similarly, "nonfarm" sources of income are commonly defined as sources of income that are *not agricultural*, whether *on or off* the farm. Such sources may include earnings from labor and management, earnings on other productive assets, or transfer payments. Examples of nonfarm sources of income include construction, transportation, trade and retailing, services, government employment, fishing, logging, mining, crafts and cottage industries, food processing, and manufacturing. In addition, some families receive returns on the rental of their fishing and logging equipment, vehicles, or other nonagricultural productive assets. In some areas, farm households are receiving pensions or remittances based on involvement of a family member in nonfarm employment.

The source of income will affect how to collect accurate data on off-farm and nonfarm income. Earned income from off-farm or nonfarm sources may come from wage employment, or it may represent returns from a family-run enterprise. Collection of these data are closely related to time allocation, and certain information may be partially collected in other categories. Efforts should be made to integrate the sections to both minimize repetition and/or provide avenues for creating consistency checks among the pieces of the survey or recordkeeping process. Nonearned income, the other major source, may represent returns on special assets, such as land and capital, or it may represent transfer payments. In turn, transfer payments may include government payments, such as pensions or subsidies, or they may represent gifts and remittance income, money sent to the family from members working outside of their immediate community. This source of nonfarm income may not be mentioned unless household members are asked specifically about pensions and remittances.

The major methods for collecting nonfarm and off-farm data are records, interviews, surveys, and observation. Open-ended interviews and observation play particularly important roles in collecting data on unfamiliar enterprises. These methods are frequently used as tools in the early stages of fieldwork and provide basic information useful in setting up more detailed recordkeeping and survey systems.

The remainder of this chapter will address how to collect off-farm and nonfarm income data. In the first section important conceptual issues such as defining income, accounting for long-term investments in capital to obtain net income, issues relating to privacy and respondent cooperation, and the valuation of in-kind transfers and nonmarket goods are discussed. The second section examines the different methods of off-farm data collection, focusing on the use of records versus surveys and ways to conduct effective interviews. Finally, organizational issues relating to grouping data and special characteristics of nonfarm and off-farm income data are presented.

## 2. CONCEPTUAL ISSUES

### DEFINING INCOME

Income, unlike other quantities that can be directly measured such as yields, total cash sales, and expenditures, is derived from other measurements. Even in the case of wage labor, meals may be provided and thus need to be included in the income figure, or commuting costs may be involved and will need to be subtracted from the income figure. A simple definition of income would be the total revenue from an activity less total costs. Such a definition equates income from individual activities with net revenue or the profits from these activities. For some enterprises, especially family-run enterprises, it may be possible to construct budgets for the enterprise much as budgets for agricultural enterprises are constructed. However, conceptual problems do not end here.

It is not always clear how to value some of the inputs or outputs in an off-farm or nonfarm activity or whether they should be valued at all. For example, should commuting costs, even if they entail no cash cost, be included? Should the cost of meals be deducted if the worker had to purchase food because he or she was working far away from home? How should items sold on credit be valued if no interest is being charged to the buyer and the ultimate date that the item was paid for is unknown?

A distinction may also be made between cash income and income in the form of the products of a nonfarm or off-farm enterprise that are consumed by the family. Respondents are often not aware that information on total income is being collected, not just on cash income. In some settings, products consumed by the family are simply not considered income. (In the Philippine study this was particularly true in the case of fish caught for home consumption.) This practical problem can compound the conceptual problem. The researcher may not be entirely sure that the respondents were providing total net returns, not just cash income from an activity. When it is suspected that only cash returns have been provided, the researcher is left in the awkward position of deciding whether or not to estimate the value of home-consumed goods or services, and if so, how!

Another issue is how to handle fixed costs, particularly depreciation or replacement costs for capital, or returns on investments. What if this capital is unique or for some reason the replacement cost or lifetime of the equipment or tools is difficult to estimate? This issue is discussed in greater detail in its own section below.

## ACCOUNTING FOR INVESTMENTS

One difficult issue in determining nonfarm and off-farm income is how to account for previous investments which are currently generating revenue for the household. In some activities, these investments are primarily in tools or structures, for example, in carpentry, construction, transportation, mining, logging, fishing, or cottage industry. This is particularly important in family-run enterprises as opposed to wage labor sources of income. In some countries, and in some industries, even wage laborers are expected to provide their own tools (for example, in carpentry). The issue becomes even more difficult in the cases of transfer payments, such as remittances, which represent returns from investments in education, training, and migration. Should part of the cost of education in some previous time period be charged against the current income which that education made possible?

Whether these costs are subtracted from current total returns or not also depends on whether the researcher is interested in examining net returns from enterprises or is interested in current total family income. If the study requires determination of net returns, then some form of depreciation or replacement cost must be included. Some methods for doing this are discussed in more detail in Working Paper 91-14 on Farm Production. Calculating depreciation basically requires knowledge of the useful life of the capital and its purchase price and some assumptions on how the value of this capital is actually changing with time and use. The replacement cost approach requires knowledge of the price of capital if it were purchased in the present time period and the life of this capital.

Calculating the costs of migration, education, training, and other investments in human capital or figuring out the returns on these investments is more difficult because it involves estimating returns over a longer horizon, generally the estimated time period over which a person will be employed in an activity in which they utilize the human capital created through those investments. One good example of this is based on the Philippine study. In the Philippines, remittances from overseas contract workers are becoming increasingly important as a source of income (the Philippines sent an average of 600,000 workers abroad every year during the late 1980s or about 3 percent of its adult labor force). The importance for certain rural communities can be far greater. In the study village, for example, 22 percent of total income for 51 families came from remittance income, and most of this was from a few overseas contract workers sending large amounts of money back to a handful of families. However, these large amounts of income represent returns on substantial investments made by families in the education of their children and in their placement in overseas positions. Although a few families were receiving large amounts of income during the years their children worked abroad, they had made large investments in previous years to achieve this. If the costs of education, placement fees, and migration costs were all taken into account, the returns to these families may not have been as great as they first appeared. In addition, several of these families had to repay substantial debts they had accumulated while preparing and sending members overseas and, consequently, were not able to use all of this

income for household consumption. Finally, remittance income is transitory. Children only work abroad for a few years before marrying in most cases.

Similarly, pensions can sometimes be conceptualized as returns on savings. The common element in this problem is that the time frame for a study in which accurate data on investments is required is quite long, yet most researchers are only in the field for short periods of time and are collecting a cross section of data. Hence, most researchers will have to rely upon recall data and family histories for the data they need on past investments and returns. They will also need to depend on recall data to determine whether income from a particular nonfarm or off-farm source has been higher or lower than usual during the study period.

#### **PRIVACY AND RESPONDENT RECALL**

Of all types of information, data on income are commonly the most sensitive. Collecting data on nonfarm and off-farm enterprises, particularly family-run enterprises, can be complicated by respondent reluctance to provide accurate or complete data. In general, total income is underestimated because sensitive or minor sources of income are often not reported or are under-reported.

This problem is difficult to solve, other than by building up levels of trust with respondents, demonstrating to them that their privacy in handling of the data is being protected, and by cross-checking sources of information or providing cross-checks within the data collection instrument when possible. For example, neighbors often know how much income a family received during a particular time from a particular enterprise and may volunteer such information during informal conversations. Or, some family members may discuss income from various sources more openly than other members. Collecting both expenditure and income data may provide a good check on the accuracy of income data as well, although the researcher will also need to know about the use of savings and credit. The conceptual problem not only relates to not knowing how accurate total income figures are, but to knowing how accurately relative amounts of income from different sources are.

Another problem is that some families may be engaged in illegal activities and be unwilling to report returns from these activities. Some common illegal income sources in developing countries are black market trade and gambling operations. However, some illegal economic activities would normally be considered legitimate industries. For example, logging in the Philippines is illegal. The collection of certain types of flora and fauna may be illegal, or the use of certain types of technology in an otherwise respectable industry may be illegal (for example, dynamite fishing in the Philippines). Whether the researcher can collect accurate data on these income sources will depend on the researcher's rapport with local families and how strictly enforced local laws prohibiting these activities are.

#### VALUATION OF NONMARKET GOODS AND IN-KIND TRANSFERS

The valuation of nonmarket goods, barter transactions, and in-kind transfers is another problem and is not unique to collecting data on income. It has been addressed both in the working papers on consumption and expenditures and on production. In-kind payments are common in the harvest of many grain crops and other crops that are harvested all at one time. Another example of in-kind payment is when household members work in exchange labor arrangements. Valuation of nonmarket goods are less obvious but might include job search, waiting, commuting, and other transaction costs.



### 3. METHODS

#### INTERVIEWING KEY INFORMANTS AND OBSERVATION

Regardless of the methods chosen to collect nonfarm and off-farm income data, conducting preliminary exploratory interviews to develop an understanding of these enterprises can be useful in creating good surveys or recordkeeping forms. For most enterprises, it is important to understand the types of technologies used in the enterprise, or the tools and processes used in production. Information on standard units of measure and conversion rates for these standard local measurements to more widely used measurements should be established early on. This kind of information is often collected effectively through key informant interviews.

The researcher may also want to gather whatever information possible on the history of the enterprise, changes in technology, whether more or fewer people are currently engaged in the enterprise than 10 or 20 years ago, and possible reasons for change, if any. Information on inputs or raw materials used should be explored in these preliminary interviews, and markets for the products or services supplied may be discussed. Investments required to get involved in the enterprise might be addressed, particularly the investments in human capital through formal education, training, apprenticeships, and other experience. Examples of open-ended questions used in exploratory interviews on logging and on rice harvest contracts in the Philippines are presented in Appendices A and B.

Another useful method is to observe people working in a particular off-farm or nonfarm activity. Important information may be missed if the interviewer has not had the opportunity to observe the activity. Observation is particularly useful for gathering information on technologies, tools, and skills used. Watching the work performed can also assist in identifying which members tend to work on each task in a given activity, on the time it takes to perform different tasks within the activity, how much variation in this time exists between individuals, and on the location for the activity and the facilities which exist at this location.

The authors of the book agree that some of their most useful and enjoyable experiences during their fieldwork were spent observing the wide variety of nonagricultural enterprises of the sample households. It is time consuming. It takes effort to set up some of the trips (such as accompanying a farmer to his or her construction job or meeting a family member in the city). It is easy to ignore. Once done, however, the improved quality of the subsequent survey or recordkeeping system will provide more accurate and detailed off-farm and nonfarm data.

Once the researcher understands the enterprises and local off-farm and nonfarm labor markets, a survey form or record form can be created. Among the first steps to take is to ensure this portion of the data collection process is integrated into the rest of the effort. Some information needed in the study of off-farm and nonfarm enterprises may be available through other data collection instruments employed by the researcher, such as an inventory of productive assets, education and training, and time allocation data.

## RECORDKEEPING

Assuming the researcher is interested in detailed off-farm income data, records are an attractive approach, especially where families are involved in many nonfarm and off-farm activities on a seasonal, sporadic, or part-time basis.<sup>1</sup> In contrast, surveys work better where households have one or more members working in more regular or predictable nonfarm or off-farm activities.

One special problem with the use of records is that if enterprises vary significantly in the types of inputs used, the time frame for production, and other factors, it may be necessary to develop different forms for different enterprises. For example, one form might be used for recording wage labor activities, another for fishing, and another for logging enterprises. As a result, the recordkeeping system may become quite cumbersome for respondents.

In the Philippine study, only one form was used, which caused many problems. The form used is presented in Appendix C. How information on nonfarm and off-farm income sources would be recorded if the researcher were to undertake this project again is included in records 1-7 in Appendix D. The design for these is based both on forms used by other researchers and on the experience with collecting the data in the Philippine study using only one form. Basically, in these new forms, one form is used for remittances, gifts, one for returns on assets, another for wage labor activities, and one each for family-run enterprises such as logging, fishing, and snack production. The two final forms are for trading and storekeeping activities.

The most serious problem with the one form for all off-farm and nonfarm activities was that insufficient room was provided on the form for recording all inputs used. Hence, research assistants had to add this information on separate pieces of paper in several cases, such as logging and boat building, based on interviews with recordkeepers. In the case of storekeeping, the cooperative store income and balance sheets could be used to retrieve input data, but for small stores, no system was devised. Instead, storekeepers provided a rough estimate of net returns on a weekly basis. None of the small-scale storekeepers were willing to keep more comprehensive accounting records for this study.

---

<sup>1</sup> For a detailed discussion of other strengths and weaknesses of recordkeeping, the reader should examine the working papers on expenditures, time allocation, and farm production.

The advantage of the one open-ended form was that respondents provided information on many nonfarm and off-farm activities that originally the researchers did not realize were taking place in the community. Almost certainly without recordkeeping methods, many nonfarm and off-farm activities would have been neglected. For example, in the Philippines the extensive involvement of families in rice harvesting contract labor and the collection of minor forest products would have been missed if not for the one form recordkeeping format. In addition, the one form was less bulky and less cumbersome for the recordkeepers than several different forms would have been.

Regardless of the type and number of forms used in recordkeeping, training household members how to record data is critical. The most serious problem in the Philippines was convincing participants that what was needed was *total* returns and *total* expenses, not just *cash* returns from nonfarm and off-farm enterprises. This was particularly critical in the cases of fishing and gathering of wild food products. Finally, keeping records implies that households in the community must have at least one member literate enough to complete the forms. Even in the Philippines where literacy rates are relatively high, this was a problem. In several cases, research assistants were forced to visit the household every few days and maintain the household records for those families that had trouble keeping records. This required a higher assistant-to-respondent ratio than would be the case if using less frequent survey interviews.

In nearly all of the study sites technology, "accounting methods," and business styles used in off-farm and nonfarm enterprises differed among villages even more than agricultural activities did. Thus, in a different village it may be necessary to modify the collection of forms. This is why the initial interviews on nonfarm and off-farm enterprises in all of the study sites are so helpful.

## SURVEY INTERVIEWS

Although records kept by a well-trained, conscientious household member potentially will provide the most detailed and accurate data, a survey instrument often makes sense. Under some circumstances, surveys can collect data that are just as detailed as that collected in recordkeeping systems and can form the basis for studies that need intensive information on off-farm and nonfarm enterprises. Surveys may also be the best way to gather data if the researcher requires only total household information. These two survey procedures differ and are examined separately below.

If total household income or less detailed data are needed, the survey instrument can be set up to enumerate the amount of time (e.g., the number of days) and the piece rate (e.g., wage or average net revenue per time unit received). An example of a survey form used in the China study is presented in Appendix E. This table is divided into two parts. The first half prompts the respondent by listing all of the major off-farm and nonfarm activities in which area farmers engage. These were identified in the presurvey. In this part the

enumerator identifies the off-farm and nonfarm activities that were performed by each household member.

The information from the first table provides the enterprise and family number codes required by the enumerator to fill in the second half of the form. After transferring this information, the respondent is then asked to estimate the *number of days* during the previous six month period ("since the time the rice was transplanted") that *each* family member worked at each job. Next, the unit of payment (i.e., "per day," "per month," or "per task") is identified. Finally, the net amount received per time unit is entered for each activity. The enumerator would then extend the figures (either mentally or on the margin of the form) and ask the farmer if he or she thought the total net revenue per six month period sounded reasonable. If not, then adjustments would be made in either total number of days worked or in the wage.

Although this method of data collection is probably more error prone than recordkeeping system, when these figures were compared to those collected by more intensive survey methods (described below) a remarkable degree of correlation was found. Income collected with this abbreviated form, however, was usually found to be overstated - both by the number of days worked *and* by the *net* revenue per time. The reasons for these biases are examined below and suggestions for guarding against them are provided.

The problems with enumerating income from nonfarm and off-farm activities differs according to the type of work. For example, for workers in full-time jobs, the number of days off per month should be explicitly enumerated. Only the number of days actually worked should be recorded. Also, if the wage rate is given in on a per day basis, it should be verified that this has not been derived from monthly wage and divided by 30. As will be seen below, monthly and daily wage payment schemes may have different implications in terms of actual opportunity cost.

Many off-farm and nonfarm activities do not provide regular work schedules. The number of days worked per month varies. Construction jobs, transportation work, and agricultural labor are the most common types of work with irregular schedules. If the survey is conducted monthly, recall is generally good. In China, however, a six-month enumeration period was used, and unless the farmer was clearly able to provide an answer, he or she was asked to estimate the average number of days worked per month in the particular occupation over the previous six-month period.

The most difficult types of activity to enumerate (the ones that probably lend themselves best to recordkeeping) are those where the farmer worked a block of days for a single payment. This type of activity includes shopkeeping, logging, processing, and other household handicraft and small-scale enterprises. When collecting information on this type of job activity with an "abbreviated" survey method, two issues should be emphasized. First, the farmer should be reporting *net*, not gross income. Second, the number of hours worked per day and number of days per month must be carefully estimated or great errors can appear in the extended total net revenue for the period.

When enumerating off-farm and nonfarm income with an abbreviated survey form, the most important pieces of information to understand when asking the question are the unit of time and the piece rate that the farmer is most comfortable thinking in. For example, when performing harvest work in Nepal, farmers are usually paid daily. In the Philippines, they get a proportion of the harvest. At some point the conversion between average share per day and the net value of that share must be made; farmers, however, should not be asked to turn a lump sum salary into daily wage. This task should be left to the researcher.

While these careful and consistent measures will produce fairly accurate estimates of off-farm and nonfarm income, these figures will still be subject to many systematic errors. Use of a more complex and detailed survey form can help overcome some of these problems and should provide more accurate information by carefully enumerating costs and revenues, including both cash and noncash transactions. In addition to estimates of income, the intensive survey method can provide rich detail on elements such as the importance of resource constraints, time allocation elements, transportation, and transaction costs and the opportunity costs of undertaking the off-farm activity.

In China, to get the more detailed information a series of "supplementary" activity-specific forms were used. An example of the form for farmers who worked in construction jobs is in Appendix F. These forms were designed to be used in conjunction with the primary forms already discussed above (Appendix E).

In all, 10 supplementary forms were used, one each for livestock, fishing, forestry, mining, trading, factory work, construction, transportation, government, and others. Mechanically, these forms took up a lot of space (a separate form was required for each different enterprise performed by each household member). Additionally the forms also varied somewhat from village to village. Consequently, these groups of forms were not bound into the survey instrument itself. Instead, each day the enumerator took an "off-farm supplementary packet" of forms, which contained two blank forms for each enterprise for that village. Once the survey was completed for a given respondent, enumerators taped the supplementary forms permanently into the inside of the back cover of the primary instrument to avoid losing or mixing up the supplementary sheets.

Although the supplementary forms varied from enterprise to enterprise and even from place to place for a given enterprise, they were all set up as "income statements." The general pattern was to first enumerate all of the revenues and then all of the expenses, leaving an estimate of net income. In both the revenue (and expense) sections, cash inflows (and outflows) were listed first and the noncash transactions second. It was discovered when comparing the detailed supplementary form with the abbreviated form that cash income was often understated for some enterprises because many of the secondary sources of income from by-product sales, bonuses, and rent were missed. Overall, however, when considering full income - cash and noncash - it is unclear whether income is systematically understated or overstated since both noncash revenues *and* expenses were left out.

An example of these multiple sources of revenues and expenses can be seen in the factory work supplementary table in Appendix G. Besides the basic salary or wage, other sources of inflowing revenues include bonus, overtime payments, meals and lodging, etc. On the expense side, factory workers in China frequently had to pay job fees, satisfy an apprenticeship requirement, purchase tools, incur transportation and commuting costs, etc.

Besides enumerating these expenses, a separate section of each form was used to enumerate the number of labor hours put in the enterprise during the season. For example, in the fishing form in Appendix H prompts were used to ask the farmer how much each household put into fish pond construction, maintenance, the purchasing and processing of fish food, and the care, maintenance, harvest, and marketing of the fish products. When asked this way, it was usually discovered that the abbreviated form underestimated the amount labor put into most off-farm enterprises.

Finally, a section in each of the off-farm income questionnaire in the China study contained one or more questions in order to determine the opportunity cost of labor. Typically the farmer was asked questions such as whether his salary would be reduced if he (a) could choose the days he wanted to work; (b) took time off during the peak agricultural season, e.g., during plowing or harvest; and (c) if so, by how much. One purpose of this last section was to estimate a peak season agricultural wage. This type of information is particularly useful in areas where agricultural labor markets are not well-developed.

Making the choice between choosing recordkeeping or a survey depends on many factors, but in off-farm income data collection the regularity of employment is the key factor. Respondents may find it difficult to remember how much total income they received from enterprises which they are employed in on a sporadic or infrequent basis. The best approach may be to use surveys that prompt respondents by activity, by specific time periods, and by specific family member. During these interviews, it also may be helpful if the interviewers are familiar with the local calendar for seasonal activities such as off-farm labor, fishing, gathering, and logging.

Surveys (or recordkeeping systems) that prompt the respondent are also most effective for collecting information when respondents are reluctant to discuss their incomes. Farmers frequently will provide a series of accurate detailed responses rather than saying outright the family total net income. A more detailed, prompted approach changes the focus on family income to a focus on the enterprises themselves, making the questions less threatening to respondents.

If records are used, the researcher should plan to check these records every one or two weeks. This interaction was found to be critical in gathering yield data by recordkeeping, but such an approach required that extensive time be spent by the enumerator team in the villages. How frequently surveys should be conducted will depend on the types of local nonfarm and off-farm activities and how easy it is for farmers to recall their involvement and income from such activities. In areas where permanent regular employment is unusual, surveys may need to be as frequent as every month to collect good quality data.

#### 4. ORGANIZATIONAL ISSUES

As the researcher begins to create a survey or recordkeeping form, she would be wise to decide how she may want to analyze this data in advance and set up her definitions accordingly. For example, the researcher may wish to classify activities as being agricultural but off of the farm and nonagricultural, or she may wish to lump all of these activities together. Likewise, whether the income is from wage labor or family-run enterprises may be important in the analysis. The researcher may also want information on the amounts of income from full-time, part-time, and casual labor. Alternatively, she may wish to aggregate income sources by whether they are from traditional rural industries or modern industries, or by the skill and education of the workers, by gender, or by the wage rates. Thinking through these issues in advance is useful in structuring the survey or record and in later analysis. Other distinctions the researcher may wish to make are between remittances, gifts, pensions, subsidies, and returns on assets.

It is not always clear whether an activity should be classified as agricultural or not. For example, fish culture, wine production, and gathering might fall in either category, depending on the study and the area. Likewise, the boundaries between off-farm and on-farm can be fuzzy. For example, in areas where livestock are allowed to graze in communal grazing lands, is livestock production an off-farm activity? No hard and fast rules exist in making these distinctions. What is important is that the researcher carefully document the distinctions and classifications made. Sometimes following census standard industry classifications (SIC) from the country under study or from the United States, when appropriate, can be a useful starting point. Ultimately the most useful guide is the focus of the study and the researcher's sense of how to aggregate data for analysis.

Even after listing different sources and aspects of nonfarm and off-farm activities, some activities and aspects are likely to be overlooked. Discussing the survey or record forms or showing them to a knowledgeable key informant may be useful in checking the completeness of the data collection instrument. It is also useful to know the factors and sources of income most commonly overlooked. Some of the most frequently forgotten data are on the commuting costs involved in engaging in nonfarm and off-farm activities, the investments in the life and value of assets used in the activity, and conversion rates for frequently used local measures to international measures.

One good way to check the accuracy of the data collected is to devise forms, whether survey or record, with spaces provided for the calculation of net returns so that these may be checked with the respondent during the interview or during a check on records. This can be particularly useful in identifying neglected costs and additional returns, for example, from by-products.



## 5. CONCLUSIONS

Understanding the economic opportunities for rural families in nonfarm and off-farm enterprises is a relatively new area of research. As developing countries grow and agricultural land becomes relatively scarce, these off-farm and nonfarm income sources become critical in determining whether families remain in rural areas or migrate to urban centers. They also help determine the strength of the economic base of communities and regions and their potential for development.

In this chapter, different sources of nonfarm and off-farm income have been mentioned, including agricultural wage labor, food processing, transportation, trading, logging, fisheries, cottage industries, remittances, and pensions. An important initial source of information is gained through interviewing people knowledgeable about a given enterprise in the community and by observing these activities. Because people are usually reluctant to volunteer information about their incomes, the best approach to collecting data is by enterprise and by using a prompting rather than an open interview or recordkeeping form.

Researchers who collect information in this area should remember to obtain information on the tools and technologies used, the investments in physical and human capital required, commuting costs, and other forms of transaction costs required to engage in off-farm and nonfarm enterprises or that account for the receipt of transfer payments, remittances, or gifts. In addition, information on family and hired labor is important in examining returns to nonfarm and off-farm enterprises. A researcher who is interested more specifically in agriculture or primarily in sources of income by broad categories such as farm, nonfarm, or remittance, may not need to collect as detailed information as someone who wishes to examine specific nonfarm and off-farm enterprises or income sources in greater detail.



APPENDIX A

INITIAL INTERVIEW ON LOGGING IN A PHILIPPINE VILLAGE

- 1) Can you describe the steps involved in logging in this community?
- 2) What tools do you use and how are they used? Has there been any change in the types of tools used recently?
- 3) How do loggers generally learn their trade?
- 4) How long has logging been going on in this community?
- 5) Do you think that more families are currently involved in logging than 10 years ago?
- 6) Where do you sell your lumber?
- 7) What tree species do you harvest and for what uses?
- 8) How does the price for lumber vary by quality and species?
- 9) Do local loggers log alone or in small groups or how are they organized?
- 10) What are the major expenses involved in logging?
- 11) What are the different jobs involved in a logging operation?
- 12) How are loggers paid for their work? How are other workers involved in the logging operation paid and how much is their wage?
- 13) On average, how far must loggers commute to get to the forest where they log? How long does it take them to get there?
- 14) Is there a logging 'season', and if so, when is it?
- 15) What are the basic units of measurement for lumber?

APPENDIX B

INITIAL INTERVIEW ON RICE HARVESTING ARRANGEMENTS

- 1) Can you describe the process of harvesting rice under contract?
- 2) How do you arrange the contract?
- 3) What tools must you supply? What tools are supplied by the owner of the rice?
- 4) How are rice harvest contract workers paid?
- 5) How much are workers paid and has this changed much recently?
- 6) What are the costs involved for the workers?
- 7) How long has rice harvest contracting been used in this village?
- 8) Are there more families involved in contract work now than 10 years ago?
- 9) What do you see as being the reasons for any changes in this activity?
- 10) Are contracts renewed each season or are they maintained for a longer period of time?
- 11) When do families engaged in rice harvest contracts have the most work to do related to their contracts?
- 12) Who in the families generally supplies the labor for this activity?
- 13) Does a family with a harvest contract ever hire additional laborers in order to fulfill their contract?
- 14) How many different contracts is one family likely to have?
- 15) How do families coordinate planting, weeding and harvesting when they have more than one contract?

APPENDIX C

ORIGINAL OFF-FARM AND NONFARM INCOME RECORDKEEPING FORM  
FROM THE PHILIPPINE STUDY

Sources:

Date	Fishing	Logging	Crafts	Number of units	Total Revenue	Total Costs	Net Revenue
5/3	X			10 pcs.	P25.00	P5.00 for line	P20.00
5/7			X	1 mat	P200.00	P25.00 for fiber and dye	P175.00
5/9		X		850 brd ft	P1700.00	P120 for 3 days food for 4 men	P1580.00

APPENDIX D

MODIFIED RECORDKEEPING FORMS FOR NONFARM AND OFF-FARM INCOME

1. Income from Remittances, Pensions, and Gifts

Date	Remittances	Gift	Pension	Total Revenue
5/2	from son			P500
5/7		from sister		P25
5/8			govt service	P450

2. Income from Productive Assets

Date	Asset Type	Amount Used	Rental Rate	Total Revenue	Quantity of Cost Items	Cost	Net Revenue
5/2	irrigated rice land	1 ha.	1/2 of harvest	P4,5000	3 bags 16-20-0 2 bags Urea	P750 P400	P3,350
5/7	hand tractor	2 days	P75 per day	P150	2 days deprec.	P20	P130

Appendix D (continued)

3. Income from Wage Labor

Date	Activity	Time Employed	Wage Rate	Total wages (plus value of meals)	Cost Items	Cost	Net Revenue
5/1	plowing	3 days	P50/day	P180			P180
5/4	carpentry	5 days	P65/day	P375	jeep fare and dinners	P10 P50	P315
5/9	weeding	1 day	P25/day	P30			P30

**Appendix D (continued)**

**Record 4.. Logging Record (fill out 1 for each contract or job)**

Name of contract \_\_\_\_\_ 'housebuilder'

**Wood contracted:**

Amount	Type	Price/ board ft.	Total Cost
266 brd.ft.	tagilumbo	P3.80	P1011
16 brd.ft.	batikuling	P4.00	P64

**Supplies Purchased:**

Date	Item	Amount	Price/unit	Unit	Total Cost
3/7/5	rice	20 kg.	P7.50	kg.	P150.00
3/5	fish	5 kg.	P25.00	kg.	P125.00
3/5	saw blade	1	P25.00	pc.	P25.00

**Labor Hired:**

Date	Activity	# Workers	Total Worker Days	Wage Rate	Total Wages
3/5	cutting	1	4	P25.00	P100.00
3/9	hauling	2	1	P.50/brd.ft.	P141.00

Total Revenue P1075

Costs: Supplies P300.00  
 Labor P241.00

Net Revenue P534.00

Your Share P 178.00

**Appendix D (continued)**

**Record 4.. Logging Record (fill out 1 for each contract or job)**

Name of contract \_\_\_\_\_ 'housebuilder'

**Wood contracted:**

Amount	Type	Price/ board ft.	Total Cost
266 brd.ft.	tagilumbo	P3.80	P1011
16 brd.ft.	batikuling	P4.00	P64

**Supplies Purchased:**

Date	Item	Amount	Price/unit	Unit	Total Cost
3/7/5	rice	20 kg.	P7.50	kg.	P150.00
3/5	fish	5 kg.	P25.00	kg.	P125.00
3/5	saw blade	1	P25.00	pc.	P25.00

**Labor Hired:**

Date	Activity	# Workers	Total Worker Days	Wage Rate	Total Wages
3/5	cutting	1	4	P25.00	P100.00
3/9	hauling	2	1	P.50/brd.ft.	P141.00

Total Revenue P1075

Costs: Supplies P300.00  
 Labor P241.00

Net Revenue P534.00

Your Share P 178.00

Appendix D (continued)

Record 6. Storekeeping (weekly form)

Date	① Cash at Opening	② Cash at Closing	③ Value of Goods Purchased on Credit	④ Value of Goods Consumed by Family	⑤ Expenditures on New Stock	⑥ Travel Tax & Other Expenses
3/1	P50.00	P125.00	P20.00	P10.00		
3/3	P25.00	P355.00	P10.00	P 5.00	P250.00	P10.00

② + ③ + ④ - ① = Total Revenue P450.00

⑤ + ⑥ = Total Costs P260.00

② + ③ + ④ - ① - ⑤ - ⑥ = Net Revenue P190.00





APPENDIX E

EXAMPLE OF SURVEY FORM FOR ENUMERATOR (NONFARM AND OFF-FARM INCOME)

non-cropping labor activities  
这部分了解种植业以外的生产情况。

3.3 本季(去年十月份至今)您家庭成员中有哪几个人经常参加种植业以外的活?  
Which family member engaged in each of the following activities this season:

3.3.1 养殖业(大规模) 否  是  人员号: \_\_\_\_\_  
Large Scale Livestock no yes member code (m.c.)

3.3.2 渔业 否  是  人员号: \_\_\_\_\_  
Fishery n y m.c.

3.3.3 家庭工业 否  是  人员号: \_\_\_\_\_  
Family Industry n y m.c.

3.3.4 运输 否  是  人员号: \_\_\_\_\_  
Transportation n y m.c.

3.3.5 做买卖 否  是  人员号: \_\_\_\_\_  
Commerce/Trade n y m.c.

3.3.6 在厂里工作 否  是  人员号: \_\_\_\_\_  
Factory n y m.c.

3.3.7 建筑方面 否  是  人员号: \_\_\_\_\_  
Construction n y m.c.

3.3.8 在矿上打工 否  是  人员号: \_\_\_\_\_  
Mining n y m.c.

3.3.9 林业 否  是  人员号: \_\_\_\_\_  
Forestry n y m.c.

3.3.10 政府、党、团、等 否  是  人员号: \_\_\_\_\_  
组织工作 n y m.c.

3.3.11 其它-1 否  是  人员号: \_\_\_\_\_  
Govt, Party, Other n y m.c.

3.3.12 其它-2 否  是  人员号: \_\_\_\_\_  
Other-2 n y m.c.

如果全答否, 则答3.5; 如果有一个答是, 答下页

if all boxes are checked "no" go to 3.5; if not continue... 接下页.....

Appendix E (continued)

LABOR  
劳 力

3.4 请填写本季（去年十月份至今）不同家庭成员从事种植业以外工作的时间及收入情况。  
Compensation and number of days worked by each member:

人员号 member code	Non-crop. 非种植业活动 Activity			
	活动1 Activity Code (用标号填)		活动2 Activity Code (标号) (use code)	
	工作天数 # of days worked this Season.	收入形式 元/天, 元/月 income \$/day; \$/month	工作天数	收入形式 元/天, 元/月 same

标号: code

- 1 = 养殖业 Livestock
- 2 = 渔业 Fishing
- 3 = 家庭工业 Family Industry
- 4 = 运输业 Transportation
- 5 = 商业 Commerce
- 6 = 工厂做工 Factory Job
- 7 = 建筑业 Construction
- 8 = 矿上做工 Mining
- 9 = 林业 Forestry
- 10 = 政府及组织工作 Official
- 11 = 其它: Other-1
- 12 = 其它2: Other-2

续表: continue table 3.4

same as form above

人员号	非种植业活动			
	活动3 (标号)		活动4 (标号)	
	工作天数	收入形式 元/天, 元/月	工作天数	收入形式 元/天, 元/月

本页共 8 行，最后一个空行留给 8 号用，否者全果成



APPENDIX G

SUPPLEMENTAL NONCROPPED AGRICULTURAL FORM (FACTORY JOB)

工厂工作

1. 到工厂工作你需要走多少分钟?  分 Minutes  
How long is your commute to the factory?
2. 你得花交通费吗?   
Do you pay your own  
traveling or public costs? 是=1;否=2 yes=1; no=2
3. 交通费多少钱?  元 Yuan  
How much do you pay?
4. 你每月平均往返几次?  次 Each  
How many times on the average per month?
5. 在工厂你得交自己的住宿和伙食费吗?   
Do you pay your own room and board when  
working in the factory? 是=1;否=2 yes=1; no=2
6. 每月你平均住在厂里几天?  天 days  
In an average month how many days  
do you live in the dormitory?
7. 在厂里,你每月花在住宿吃饭上多少钱?  元  
On average how much do you pay each month?
8. 年底你可以分到一份红利吗?   
Do you get a bonus at the end of  
the year? 是=1;否=2 yes=1; no=2
9. 如果能分到,得多少红利?  元 yuan  
If you receive a bonus, how much will  
it be? 是=1;否=2 yes=1; no=2
10. 你干这个工作多久了?  月 month  
How long have you been in the occupation?
11. 你找这个工作花了钱了吗?   
Did you have to pay a fee to  
get this job? 是=1;否=2 yes=1; no=2
12. 花了多少钱?  元 yuan  
How much did you pay?
13. 为了继续干下去,每年你都要交一笔钱吗?   
Do you have to pay a fee or annual dues  
each year to keep your job? 是=1;否=2 yes=1; no=2
14. 交多少钱?  元 Yuan  
How much are the annual dues?
15. 工具是自己买的吗?或你要买一些工具才能上工吗?   
Are you required to own tools? 是=1;否=2 yes=1; no=2
16. 工具花了多少钱?  元 yuan  
How much are your tools worth?
17. 你的工资是依据劳动额交付的吗?   
Are you paid on a piece rate? 是=1;否=2 yes=1; no=2
18. 请简单描述一下你得到工资的方式:  
Explain how wages are paid to you:  是=1;否=2
19. Are your wages deducted if you take off work to  
work on your farm?  yes=1; no=2  
... during the peak season?  yes=1; no=2  
... anytime?  yes=1; no=2

APPENDIX H

SUPPLEMENTAL NONCROPPED AGRICULTURAL FORM (FISHING INDUSTRY)

Household Code:

Family Member Code:

1. Was there a contracting fee?

yes=1 no=2

2. How much was it?

3. Do you manage the fish pond yourself?

yes=1 no=2

4. How big is it?

5. What was your original investment in the entire fishing enterprise?

a. ...in the fish pond excavation?

b. ...equipment?

c. ...boat and nets?

d. ...other: \_\_\_\_\_

6. What is your total revenue?

a. ...Revenue from fish sales

Appendix H (continued)

b. ...Revenue from other water products

c. ...Revenue from processed products.

7. What are your total expenses?

a. ...Interest on loans for short and long term investments

Interest Rate

b. ...Hired labor costs

Wage

c. ...Feed Expense

Price

d. ...Fertilizer Expense

Price

e. ...Fish Fingerlings

Price

f. ...Processing Costs

Appendix H (continued)

g. ...Marketing Expenses

Transportation

Other: \_\_\_\_\_

7. Family Labor Use:

a. for production

i. family member code: \_\_\_\_\_

ii. family member code: \_\_\_\_\_

iii. family member code: \_\_\_\_\_

b. for processing

i. family member code: \_\_\_\_\_

ii. family member code: \_\_\_\_\_

iii. family member code: \_\_\_\_\_

c. for marketing

i. family member code: \_\_\_\_\_

ii. family member code: \_\_\_\_\_

iii. family member code: \_\_\_\_\_

8. How much of your own family's grain did you use?



Appendix H (continued)

9. Fish take:

Type of Fish	Harvested Amt (jin)	Price (yuan/jin)
1.		
2.		
3.		
4.		

## REFERENCES

- Anderson, Dennis, and Mark W. Leiserson. 1980. "Rural Nonfarm Employment in Developing Countries." *Economic Development and Cultural Change*. 28(2): 227-248.
- Besteman, Catherine. 1989. "Economic Strategies of Farming Households in Penabranca, Portugal." *Economic Development and Cultural Change*. 38(1): 129-143.
- Boisvert, Richard N., and Christine Ranney. 1987. *The Importance of Non-Farm Income in Farm Family Income Inequality in New York*. Staff Paper No. 87-7. Ithaca, NY: Cornell University, Department of Agricultural Economics.
- Chinn, Dennis L. 1979. "Rural Poverty and the Structure of Farm Household Income in Developing Countries: Evidence from Taiwan." *Economic Development and Cultural Change*. 27(2): 283-301.
- Chuta, Enyinna, and Carl Liedholm. 1979. *Rural Non-Farm Employment: A Review of the State of the Art*. African Rural Economy Working Paper No. 4. East Lansing, MI: Michigan State University.
- Findeis, J. L., and V. K. Reddy. 1987. "Decomposition of Income Distribution Among Farm Families." *Northeastern Journal of Agricultural and Resource Economics*. 16(2): 165-173.
- Kyle, Steven C. 1990. *Farm Production Risk and Reliance on Off-Farm Income*. Working Paper 90-2. Ithaca, NY: Cornell University, Department of Agricultural Economics.
- Leones, Julie P. 1991a. *The Impact of Remittances on Rural Income Distribution and Social Welfare: The Importance of Institutional Context*. Working Paper No. 67. Tucson: University of Arizona, Department of Agricultural Economics.
- \_\_\_\_\_. 1991b. *The Impact of Non-Farm Activity on Income in a Philippine Upland Village*. Working Paper No. 66. Tucson: University of Arizona, Department of Agricultural Economics.
- \_\_\_\_\_. 1990. Sources of Variance in Household Production and Income in a Philippine Upland Village. Ph.D. Dissertation, Ithaca, NY, Cornell University.

- Lerman, Robert, and Shlomo Yitzhaki. 1985. "Income Inequality Effects by Income Source: A New Approach and Applications to the U.S." *Review of Economics and Statistics*. 67: 151-156.
- Low, A.R.C. 1981. "The Effects of Off-Farm Employment on Farm Incomes and Production: Taiwan Contrasted with Southern Africa." *Economic Development and Cultural Change*. 29(4): 741-747.
- Rief, Yaffa Machnes, and Susan Hill Cochrane. 1990. "The Off-Farm Labor Supply of Farmers: The Case of the Chiang Mai Valley of Thailand." *Economic Development and Cultural Change*. 38(4): 683-698.
- Shand, R. T. (ed.). 1986. *Off Farm Employment in the Development of Rural Asia*. Papers presented at a conference in Chiang Mai, Thailand. 23-26, August, 1983. Vol. 1. Canberra: Australian National University, National Centre for Development Studies.
- Shand, R.T. 1987. "Income Distribution in a Dynamic Rural Sector: Some Evidence from Malaysia." *Economic Development and Cultural Change*. 36(1): 35-50.
- Stark, Oded, J. Edward Taylor, and Shlomo Yitzhaki. 1986. *Remittances and Inequality*. Discussion Paper No. 1212. Cambridge, MA: Harvard Institute of Economic Research.
- Syed, Reza H. (ed.). 1987. *The Rural Non-Farm Sector and Process of Economic Development*. Karachi, Pakistan: Association of Development Research and Training Institutes of Asia and the Pacific and the Advisory Centre of Pakistan.
- von Braun, Joachim. 1989. "Changing Income Sources of the Malnourished Rural Poor in Africa: Implications for Food and Nutrition Policy." PEW/Cornell Lecture Series on Food and Nutrition Policy. Ithaca, NY: Cornell Food and Nutrition Policy Program.

### CFNPP WORKING PAPER SERIES

- |      |  |                                     |
|------|--|-------------------------------------|
| # 1  | NUTRITIONAL STATUS IN GHANA AND ITS DETERMINANTS<br>ISBN 1-56401-101-1   | Harold Alderman                     |
| # 2  | THE IMPACT OF EXPORT CROP PRODUCTION ON<br>NUTRITIONAL STATUS IN COTE D'IVOIRE<br>ISBN 1-56401-102-X                             | David Sahn                          |
| # 3  | STRUCTURAL ADJUSTMENT AND RURAL SMALLHOLDER<br>WELFARE: A COMPARATIVE ANALYSIS FROM SUB-<br>SAHARAN AFRICA<br>ISBN 1-56401-103-8 | David Sahn &<br>Alexander Sarris    |
| # 4  | A SOCIAL ACCOUNTING MATRIX FOR CAMEROON<br>ISBN 1-56401-104-6  | Madeleine Gauthier<br>& Steven Kyle |
| # 5  | THE USES AND LIMITATIONS OF INFORMATION<br>IN THE IRINGA NUTRITION PROGRAM, TANZANIA<br>ISBN 1-56401-105-4                       | David Pelletier                     |
| # 6  | A SOCIAL ACCOUNTING MATRIX FOR MADAGASCAR:<br>METHODOLOGY AND RESULTS<br>ISBN 1-56401-106-2                                      | Paul Dorosh et al.                  |
| # 6  | UNE MATRICE DE COMPTABILITÉ SOCIALE POUR<br>MADAGASCAR: MÉTHODOLOGIE ET RÉSULTATS<br>ISBN 1-56401-200-X                          | Paul Dorosh et al.                  |
| # 7  | DEVELOPING COUNTRIES IN SUGAR MARKETS<br>ISBN 1-56401-107-0  | Cathy Jabara &<br>Alberto Valdes    |
| # 8  | MONETARY MANAGEMENT IN GHANA<br>ISBN 1-56401-108-9   | Stephen Younger                     |
| # 9  | DEVELOPMENT THROUGH DUALISM? LAND TENURE,<br>POLICY, AND POVERTY IN MALAWI<br>ISBN 1-56401-109-7                                 | David Sahn &<br>Jehan Arulpragasam  |
| # 10 | PRICES AND MARKETS IN GHANA<br>ISBN 1-56401-110-0  | Harold Alderman &<br>Gerald Shively |
| # 11 | THE ECONOMICS OF CAIN AND ABEL: AGRO-<br>PASTORAL PROPERTY RIGHTS IN THE SAHEL<br>ISBN 1-56401-111-9                             | Rogier van den<br>Brink et al.      |
| # 12 | COMPETITIVE ALLOCATION OF GLOBAL CREDIT CEILINGS<br>ISBN 1-56401-112-7   | Stephen D. Younger                  |
| # 13 | AN ECONOMETRIC MODEL FOR MALAWI: MEASURING<br>THE EFFECTS OF EXTERNAL SHOCKS AND POLICIES<br>ISBN 1-56401-113-5                  | Yves van Frausum &<br>David E. Sahn |

Other Agricultural Economics Working Papers

No. 91-9	Economics and the Resumption of Commercial Whaling	Jon Conrad Trond Bjorndal
No. 91-10	A Bioeconomic Analysis of the Northern Anchovy	Jon M. Conrad
No. 91-11	A Positive Theory of Agricultural Protection	Jo Swinnen
No. 91-12	What Role for <u>Leucaena Leucocephala</u> in Meeting Kenya's Fuelwood Demand?	Steven W. Stone Steven C. Kyle Jon M. Conrad
No. 91-13	Rural Household Data Collection in Developing Countries: Designing Instruments and Methods for Collecting Household Information Data	Krishna B. Belbase
No. 91-14	Rural Household Data Collection in Developing Countries: Designing Instruments and Methods for Collecting Consumption and Expenditure Data	Carol Levin
No. 91-15	Rural Household Data Collection in Developing Countries: Designing Instruments and Methods for Collecting Health and Nutrition Data	Jan Low
No. 91-16	Rural Household Data Collection in Developing Countries: Designing Instruments and Methods for Collecting Time Allocation Data	Julie P. Leones
No. 91-17	Rural Household Data Collection in Developing Countries: Designing Instruments and Methods for Collecting Farm Production Data	Scott Rozelle

CORNELL  
UNIVERSITY

Department of Agricultural Economics  
New York State College of Agriculture and Life Sciences  
Cornell University  
Ithaca, New York 14853-7801  
(607) 255-2191

Cornell Food and Nutrition Policy Program  
308 Savage Hall  
Cornell University  
Ithaca, New York 14853  
(607) 255-8093