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A discussion of research methods -- practical field procedures -- based on papers submitted by 20 social scientists from a variety of academic disciplines. Areas covered include: 1) research approaches; 2) familiarization and reconnaissance or basement studies; 3) considerations in sampling; 4) local support and cooperation; 5) developing and using data collection instruments; 6) problems with specific variables; 7) recruitment and qualifications of interviewers/enumerators; 8) training interviewers and directing their work; 9) interviewing techniques and problems; 10) winning cooperation of respondents; and 11) pre-coding, coding, and some preliminary steps in analysis. Despite its rather formidable format, this publication is intended to be a progress report or a partial contribution rather than a comprehensive reference or text.

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**FIELD DATA COLLECTION
IN THE SOCIAL SCIENCES:**

**Experiences in Africa
and the Middle East**

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AGRICULTURAL DEVELOPMENT COUNCIL, INC.
1290 Avenue of the Americas New York, N.Y. 10019

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This seminar report is based on a Conference on Field Data Collection in the Social Sciences: Experiences in Africa and the Middle East, held in Beirut, Lebanon, in December 1974.

The Beirut seminar was organized by the Agricultural Development Council under its Research and Training Network program in cooperation with the Ford Foundation, the International Development Research Centre (IDRC), and CIMMYT (International Center for Corn and Wheat Improvement). The ADC/RTN program is funded under a contract with the U.S. Agency for International Development. Support for international participation in the conference was also provided by the Ford Foundation and the International Development Research Centre.

Abraham M. Weislat, Director
A/D/C Research and Training Network

FOREWORD

As will quickly become apparent, this publication represents an effort to solve a special problem in reporting the proceedings of a seminar/workshop. It is based on papers submitted by 20 social scientists from a variety of academic disciplines, which were then discussed by the authors at a five-day meeting in Beirut, Lebanon, in December 1974. (Similar seminars were being held during the same period at Singapore for Asian social scientists and in Mexico City for a group from Latin America.)

Because each participant had been asked to prepare a self-contained paper describing his own experience in survey research, the very considerable overlap among papers was not surprising. In the Beirut meeting, although many of those participating were previously unacquainted with one another, a great deal of progress was made in arriving at points of agreement, reconciling differences, elaborating on some points, and filling gaps not adequately covered in the papers. Nevertheless, we saw no way to escape some serious shortcomings in trying to put all of the resulting materials into a useful single manuscript. The extracts "from the Beirut seminar working group reports" could not have been expected to cover systematically all issues of field survey data collection; to do this the working groups would have needed much more time than was available to them at the Beirut meeting. In addition, the extracts from individual papers do not always fairly represent an author's argument; in an attempt to reduce duplication or overlap we have unavoidably made omissions of fact or logic for

which the editor, and not the author, must be blamed.

If this publication is to be the first step in a continuing dialogue, the reader will want to become better acquainted with the participants and their work. Some readers will wish to see the full versions of participant papers that are excerpted or only briefly quoted in this publication. To that end, the following list of participants includes their mailing addresses and, for those who submitted papers, the full title of the paper and a brief statement of the research interest and experience on which it was based:

Joseph Ascroft
School of Journalism
University of Iowa
Iowa City, Iowa 52240

**"On the Art and Craft of Collecting
Data in Developing Countries"**

From 1962 to 1965 Joseph Ascroft was field interviewer and subsequently director of technical operations for a market research company in East and West Africa. In 1970, after a period of graduate study, he returned to Kenya as a Research Fellow at the University of Nairobi's Institute for Development Studies, serving on the evaluation team for the Special Rural Development Program. As principal field data collection specialist on the team he conducted baseline surveys, feasibility tests, and field experiments in six locations in Kenya.

Shawki M. Barghouti
Arid Lands Agr. Devel. Prog.
The Ford Foundation
P.O. Box 2379
Beirut, Lebanon

**"Some Cultural Constraints in Collecting
Socio-Economic Information from
Rural Communities"**

Shawki Barghouti has done dissertation research in Jordan, interviewing in 23 villages to learn about exposure to mass media and other communications channels as a factor in modernity of attitudes on agricultural and political questions. For several years he worked with the FAO "pro-

grammes for better family living" in East Africa, helping to carry out and to evaluate training programs and materials in agriculture, home economics, health, family planning and community development.

Michael P. Collinson
c/o I.L.R.A.D.
P.O. Box 47543
Nairobi, Kenya

**"Some Guidelines for Farm Economic
Data Collection in Rural Areas of
Africa"**

M. P. Collinson has been involved wholly in farm management surveys, initially in Tanzania and later in Indonesia. Between 1961 and 1966 he completed twelve surveys in Tanzania as a research economist in the Ministry of Agriculture, one objective being to develop low-cost data collection and development planning techniques based on modelling traditional farming systems. After setting out the results of this research during a period at Reading University in England, he joined the Commonwealth Development Corporation in 1971. He has since carried out four farm management surveys among tea and rubber smallholders in Indonesia.

A. M. El Hadari
Dept. of Rural Economy
Faculty of Agriculture
University of Khartoum
Democratic Republic of the Sudan

**"Problems of Field Data Collection in
Rural Areas—Some Sudanese Experience"**

A. M. El Hadari has done extensive work on the economics of agricultural production in the private pump schemes of the Sudan, and more recently has directed socio-economic studies of farming in the Nuba Mountains of Western Sudan. His work on the socio-economic characteristics of Gezira tenants included nutritional evaluation of family diets. Nutritional studies have also been part of the Nuba Mountain project.

John C. Flinn
Int'l Institute of
Tropical Agriculture
Oyo Road, P.M.B. 5320
Ibadan, Nigeria

"Procedures for Collecting Socio-Economic Data at the International Institute of Tropical Agriculture"

John C. Flinn directs studies designed to help agricultural scientists at IITA identify "packages of technology which facilitate an increase in the production of food crops in the lowland humid tropics." Field studies have sought information on existing systems of farm management, the biological and technical constraints on increased food production, and the economic and social constraints that impede adoption of new technology. Intensive work has recently been done on root crop-oil palm farming systems. Cooperation between biological scientists and social scientists (particularly economists) has been an important characteristic of the entire program.

Karl H. Friedrich
Farm Management Unit
Agricultural Services Division
FAO (United Nations)
Via delle Terme di Caracalla
00100-Rome, Italy

"The Collection and Analysis of Micro-Economic Data in Developing Countries"

Karl H. Friedrich, a farm management economist with the Food and Agriculture Organization of the United Nations (FAO), carried out his first farm survey in Tanzania in 1965. He has subsequently organized farm surveys with varying lengths of interview intervals in Mauritius and more recently in Ethiopia. A large-scale "one-shot" survey is currently under way in Tanzania. He has also advised and assisted with FAO projects, mainly in Africa, and has designed and developed FAO's computerized analysis, storage, and retrieval.

Salem Gafsi
Int'l Bank for Reconstruction
and Development (IBRD)
1818 H St. N.W.,
Washington, D.C. 20433

"Some Comments on Data Collection
in Tunisia"

Salem Gafsi has participated in three farm surveys in Tunisia and one in the midwestern United States (on the cost of building and fencing materials). His most recent Tunisian studies deal with farmer experience in the adoption of new wheat technology.

Albert H. Green
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Omer Gucelioglu
State Institute of Statistics
Prime Ministry
Ankara, Republic of Turkey

"Statistical Data Collection in Rural
Areas in Turkey"

As department head of the Institute, Omer Gucelioglu had considerable responsibility for the household survey and area sampling scheme that provided data for the 1970 Agriculture Census of Turkey. He has also worked with the Population Census and the rural area surveys which Turkey conducts regularly in hundreds of sample villages to estimate national income. (Over the years these rural area surveys have been expanded to provide information on consumer expenditures, the household labor force, household construction and investment, and household industry.)

Tariq Husain "Operational Constraints and Economic Analysis"
Int'l Bank for Reconstruction and Development (IBRD)
1818 H. St., N.W.,
Washington, D.C. 20433

Tariq Husain's academic background includes graduate work in physics, mathematics, operations research and economics. He has been with the World Bank since 1966, working in its research department for more than three years; this period included project and sector work in a number of countries. He has worked in computer simulation, decision making under uncertainty, and evaluation exercises in East Africa, and is currently involved in a project on small farm consolidation in Iran.

Tarsis Kabwegyere "The Survey Method, Participant Observation, and Some East African Experiences"
University of Nairobi
P.O. Box 30197
Nairobi, Kenya

Tarsis Kabwegyere has used a historical approach in many of his sociological studies, beginning with an analysis of the growth of a trading center in Ankole (Uganda). He has examined family life and economic change in Uganda and has traced the nature and effects of colonialism there. More recently, he has directed interviews with 1200 respondents as a basis for describing changing family life among the Akamba of Kenya. A study of 30 trading centers in five districts of Kenya is also in progress.

Bryant E. Keari
Dept. of Agricultural Journalism
University of Wisconsin
Madison, Wisconsin 53706

Telahun Makonnen and Getachew Teclé Medhin
College of Agriculture
University of Addis Ababa
P.O. Box 32
Debre Zeit, Ethiopia

"Socio-Economic Characteristics of Peasant Families in the Central Highlands of Ethiopia—Ada Woreda"

Telahun Makonnen and Getachew Teclé Medhin have used an intensive plan of repeat interviews (the cost-route method) to get data on social and economic activities of a small sample of farmers in the Ada Woreda area of central Ethiopia. Base data have been gathered on the size and type of land holding, family situation, literacy, food supply and health problems. Farming practices and use of land and labor were recorded and details of income and expenses collected. This research has also given attention to religious and social activities, including information on both time and money expenditures.

Marjorie Mbilinyi
Department of Education
University of Dar es Salaam
P.O. Box 35185
Dar es Salaam, Tanzania

"An Investigation of School Enrollment in Rural Tanzania: The Problems Encountered in the Research Process"

Marjorie Mbilinyi's principal research interest has been the attitudes and other factors that enter into family decisions about the schooling of rural children in Tanzania. Her pilot study, begun in 1968 in two regions of Tanzania, was motivated by concern about the low enrollment of girls in comparison to that of boys. The study soon revealed that its terms of reference were too narrow, and later work has dealt with the whole question of how families make decisions about such issues as the amount of education each child should get. Research has been done with families from 38 tribes in rural districts of Mwanza, Tanga, Morogoro, and Iringa regions.

John S. Nabila "Field Data Collection in Rural Areas
Department of Geography in Africa: A Methodological Approach
University of Ghana from Ghana"
Legon—Accra
Ghana

John Nabila is a geographer with special interest in population and medical geography. In addition to his duties as lecturer in geography at the University of Ghana, he heads the Evaluation and Research Unit of the Ghana National Family Planning Programme. His field research has included studies in the historical geography of Central South Mampursi and intensive work on cyclical labor migration in West Africa, with special attention to migration of the Frafra of Northern Ghana.

David W. Norman "Data Collection in Farm Management
Dept. of Agricultural Economics Studies: The Case of Northern Ni-
and Rural Sociology geria"
Institute for Agr. Research
Ahmadu Bello University
P.M.B. 1044
Samaru, Zaria, Nigeria

David Norman has worked with the Rural Economy Research Unit (RERU) at Ahmadu Bello University since 1965. As one of the first two social scientists in the University's Institute for Agricultural Research, he concentrated initially on detailed village studies of farm management designed to find out what farmers were doing (positive phase) and why (hypothesis testing phase). Later, as a staff member in the Department of Agricultural Economics and Rural Sociology, he added teaching and administrative duties to his research program. Studies are continuing at the village level, but the work has moved into a normative phase which asks what kind of choices farmers "ought" to be making and how desirable changes can best be introduced and promoted (policy phase).

O. Ogunfowora
Rural Development Research Project
Dept. of Agricultural Economics and Extension
University of Ibadan
Ibadan, Nigeria

"Farm Survey as a Data Base for Analysis and Planning: Experiences from Kwara State of Nigeria"

O. Ogunfowora has been interested in studies on which policies for integrated rural development could be based. His Kwara State study is the first step in a program to gather basic data on the Derived Savannah Belt of Nigeria. Sampling was done in 14 villages, and the farm families in the sample have been interviewed repeatedly for situational data and to record seasonal variations and other changes.

Niels G. Röling
Agricultural University
De Leeuwenborch
Hollandsweg 1, Wageningen
The Netherlands

"Some Informal Notes on the Problems of Field Data Collection in Nigeria and Kenya"

Niels Röling was Lecturer in Rural Sociology at the University of Ibadan from 1963-65, and made studies at that time of diffusion of innovations among Yoruba farmers, particularly in the cocoa industry. He later worked with the AID/Michigan State University project on the diffusion of innovations, with field data collection in Nigeria. From 1971 to 1973 he was part of the Special Rural Development Programme team based at the University of Nairobi to develop, test, and evaluate prototype development strategies.

James Ryan
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Dunstan S. C. Spencer
Dept. of Agr. Economics
and Extension
Njala University College
University of Sierra Leone
P.M.B., Freetown, Sierra Leone

**"Collecting Primary Socio-Economic
Data in Africa—Some Experiences
from Sierra Leone"**

Dunstan S. C. Spencer was research assistant on a survey of staple food crop marketing in Sierra Leone in 1966-67, using mainly the single-visit technique. From 1970 to 1973 he used multiple-visit methods to study the economics of rice production in Sierra Leone. Since 1973 he has been project leader for a large integrated study of rural employment problems there. He has also been consultant on research methodology for Michigan State University's multi-visit Ade District survey in Ethiopia.

Eric F. Tollens
Faculté des Sciences
Agronomiques
Université National du Zaïre
Boîte Postale 100
Yangambi 1 via Kisangani
Republic du Zaïre

**"Problems of Micro-Economic Data
Collection on Farms in Northern Zaïre"**

Eric Tollens has been working since 1971 on micro-economic studies of cotton and rice production in Northern Zaïre. This research has been based in the University of Zaïre's Department of Agricultural Economics, which he now heads. A farm business survey has been used to get socio-economic information on cotton farms in the entire northern cotton belt, with emphasis on the range of conditions and constraints on traditional farms. A cost-route survey method is being used to study rice production in the equatorial rain forest region between Lisala and Kisangani.

Victor C. Uchendu
Director, African Studies
University of Illinois at Urbana
1208 West California
Urbana, Ill. 61801

**"Rapid Survey Techniques for Inter-
Disciplinary Research**

Victor Uchendu's most extensive research experience was as a member of an interdisciplinary team studying factors influencing change in the agriculture of tropical Africa. Field work extended over a period of 18 months (1966-68) in six countries. An anthropologist, an agronomist, and two economists were the principal team members, and information was gathered from public officials, agricultural scientists, local leaders, traders, administrators, and others as well as from farmers and their families.

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Agricultural Development Council, Inc.
630 Fifth Avenue
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Donald Winkelmann
International Maize and Wheat
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A person not directly involved in the seminar, but one who made valuable suggestions to the editorial process, was David J. King, Land Tenure Center, University of Wisconsin, Madison.

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AN INTRODUCTORY NOTE

Almost everyone recognizes the importance of sound national plans and policies as a way of making scarce resources contribute maximally to development. But rigorous analysis of national data may not adequately protect the planner against pursuing bad policies or being blinded to better alternatives. This is because of:

The difficulty of securing adequate reliable data, particularly at the local level, to use as a base for analytical rigor.

The difficulty of continuously monitoring programs and policies to determine what actually is happening in the field, as a basis for modifying or abandoning approaches that are proving unproductive.

These problems are compounded in rural areas where communication is slow, where representation of local variability is not directly a part of the planning process, and where national planning bodies lack the time or resources to verify adequately the data from which they work.

The quality of field data collection thus becomes a crucial issue; defective data can mislead the ablest of macro-modelers, and intelligent field data collection can give him facts and insights that will greatly facilitate his work.

One need not get into a philosophical discussion of the relevance of "Western" social science theory in the developing countries in order to recognize the limitations of much Western methodology for field data collection. Some of the commonest methodological problems for social scientists in the developing world are rarely encountered in a more urbanized and mechanized and industrialized environment.

To begin with, the available statistical description of the economic and physical and human setting of the research is often defective. Census figures are usually out of date and frequently unreliable, if indeed they are available at all. Aggregate estimates give little guidance as to the questions it is important to ask in particular local settings. No list of potential interviewees is available from which to draw a sample. The research worker may speak a different language than his respondents. The measurements and terms common to them, and sometimes even the concepts of measurement they employ, may be quite unfamiliar to him.

Often the respondents (and the communities in which they live) have never encountered the idea of social science field data collection; surveys arouse both curiosity and suspicion. At the same time, rural studies usually involve scattered and remote settings; provision of transport and food and lodging for field interviewers may require some inventiveness. The choice of enumerators will be both crucial and limited, and some aspects of their training will differ considerably from what social scientists are accustomed to giving. Supervision of field staff and checks on the reliability of their work offer special problems. Even the analysis of data may call for choices or be subject to limitations the research worker had not foreseen.

Those who took part in this seminar and those who have drawn from it the material for this publication are acutely aware of the shortcomings in what they have tried to do. In seeking to assemble some "dos and don'ts" of research procedure there has been an effort to limit the discussion to the issues that arise *after* one has settled all questions about what should be researched, who should do it, and what use is to be made of the findings. Yet these fundamental questions continue to assert themselves and to interact with what occurs in the field as the study progresses. In practice, research workers may not find it easy to separate social and theoretical issues from their field procedures. For example, if a researcher is engaged in a rural development project which includes as part of its frame of

reference the equalization of incomes in a highly differentiated area, his methodology must be directed at identifying the sources of differentiation and investigating steps that could be taken to benefit the poorest farmers. How he aligns himself with local groups, the universe within which he samples, the choice of questions he asks, and the relative importance assigned to different segments of his data will all be directly affected by his frame of reference. To take another example, the methodology for exploring strategies to increase agricultural production by more rapid diffusion of some new technology (chemical weed killers, for example) is likely to dictate a concentration of attention on the more "progressive" farmers, who are usually also those with command over more resources and generally higher incomes. And the researcher cannot ignore the fact that his methodological emphasis is more likely to generate recommendations that benefit the already efficient farmer than to do something for the incomes of the poor.

This is only one of the reasons that to talk about *how* to gather field data as if that could be separated from the question of *why* a study is being made is admittedly naive. The important questions in social science research are methodological only if methodology is broadly defined to include all aspects of problem formulation, not simply the technology of collecting and dealing with data. The first and crucial step for the research worker is to be able to say, "These are the phenomena I am trying to understand; these, therefore, are the kinds of data I need." Efficient and reliable methods of data collection can only flow from the terms and nature of the subject being studied. When John Nabila looks at the situation and needs of families migrating from one part of Ghana to another, he necessarily devises a methodology unique to that question. When Marjorie Mbilinyi asks what factors enter into the decisions of Tanzanian families to keep their children in school, she utilizes techniques peculiarly adapted to what she is trying to learn. When Dunstan Spencer and David Norman seek to understand the use of labor in tropical farming in Sierra Leone and Nigeria, they turn to an

equally individualized approach. It would be futile and misleading to try to draw from the pages that follow any kind of recipes or formulas for successful social science inquiry.

We are, in other words, fully aware of the distortion that results when a publication that presumes to discuss research methodology says almost nothing about the identification of the research problem, specification of its terms and nature, operationalization of variables, and definition of its theoretical contribution. These are indeed the heart of social science inquiry, and it is painful to present something that, by omitting them, suggests an insensitivity to their importance. Our only justification is the belief that the serious student can find adequate theoretical discussions in many other references, suitable models of research design in many on-going social science projects, but few materials that refer to practical field procedures.

There is a further problem. To wrench from any particular study some "tricks of the trade" of data collection is inevitably to distort what scientific investigation is all about. The only way to see how a competent social scientist goes about his work is to look at the whole of his study, not just at attractive or interesting bits and pieces selected for special purposes.

We nevertheless conclude that the reader who is prepared to accept this publication as a kind of progress report, rather than as a text or reference, may find it of some use. By now a great many social scientists have accumulated rich field experience in rural areas of Africa and the Middle East. Each has learned much about the difficulties he is likely to encounter and the best ways of overcoming them. Yet many of these problems and solutions have had to be rediscovered, over and over, by individual research workers in different countries and regions. Many of these social scientists have done their work in isolated settings where few other scholars with similar interests were active. Some of the most useful and important work has been reported locally, in forms and outlets not widely accessible elsewhere. When findings have been presented in interna-

tional social science journals the focus of attention has understandably been on findings and conclusions rather than on the day-to-day difficulties of data collection. There has been only limited opportunity to pool experience or share knowledge on such details. This publication has only one purpose: to stimulate a more satisfactory exchange of social science field data collection experience. It was in this spirit that the participants recorded the "working rules" drawn from their own field work, and in this spirit that we have tried to excerpt or summarize or highlight the points from individual papers and from the subsequent seminar discussions.

One other point deserves to be noted. A decade ago a publication of this kind would have been primarily based on the experience of and addressed to the needs of expatriate research workers. That is no longer the case. The pages that follow certainly give evidence of the wealth of research experience that is being acquired in Africa and the Middle East by social scientists working in the land of their birth. The trend is both desirable and inevitable. The participants recognize, as do the governments of the region, the futility of localizing administrative posts but leaving the local administrator dependent on the advice of expatriate researchers and consultants. We hope the material in this publication will be fully as useful to the local research worker as to his expatriate colleague and will contribute to continued growth of local research capacity.

All of the material that follows is drawn from discussions at the 1974 Beirut seminar and from memoranda submitted by each participant in connection with that meeting. Each individual's contributions are identified with a parenthetical note of the country or region where the work was done on which his quoted observations were based.

The observant reader will note some inconsistencies and seeming disagreements in the pages that follow. Some of these relate to questions on which there is perhaps not yet sufficient experience to justify confident assertions. Some arise because of basic differences in the kinds of phenomena being studied. Research workers in farm man-

agement, for example, have usually sought detailed farm and family account data based on regular and frequent visits to the same sample households (the "cost-route" approach). Some of the other social scientists represented have worked on questions for which the relevant data could be gathered in a single visit to each sample unit. Although most of the participants were concerned with the dynamics of systems and processes, rather than with static descriptions, we did not find a way to organize this publication to adequately reflect that concern. These are only a few of the limitations the reader should bear in mind in evaluating particular comments or suggestions.

In short, the editors and authors would wish this volume to be judged—and used—as a partial contribution rather than as a comprehensive reference. They hope it can be part of broader discussions of social science research methodology, and also that it will invite and encourage others to add to the body of experience about practical field data collection problems.

I. RESEARCH APPROACHES AND AIMS OF THE STUDY

THE FIRST QUESTION: PURPOSES OF DATA COLLECTION

Field data collection in the social sciences always involves a series of strategic choices aimed at making limited resources go as far as possible. From relatively small bodies of data the research worker hopes to be able to draw inferences and make warranted predictions about important variables. The urgency of beginning with a clear and careful specification of aims and objectives cannot be stressed too strongly; otherwise it is impossible to make consistently efficient choices as the study progresses.

Surveys frequently accumulate masses of information that, for one reason or another, are used only partially or not at all. Yet the research worker at the analysis stage much too often finds the data on key variables incomplete or inadequate. Standards of precision, accuracy, and reliability may be either wastefully high or inexcusably low in relation to other specifications of the study. Sampling strategies, units of data collection, schedules, and methods of analysis all grow out of one's understanding of what the study is expected to accomplish.

Before he does anything else, then, the research worker must be sure that he is clear as to the kind of information he is seeking to gather:

Data for identification of problems or of cases establishing the occurrence of phenomena or relationships (random sampling not required),	or	Estimates of population characteristics based on projection from a sample (random sampling essential).
Information for which <i>measurement error</i> is to be minimized (data collection strategy concentrates on accuracy, as in farm management studies),	or	Information for which <i>sampling error</i> is to be minimized (data collection strategy stresses ability to project estimates to a larger universe).
Information intended to provide general insights, generate hypotheses, etc.,	or	Information to be used for specific purposes: hypothesis testing, evaluation, etc.
Information gathered only to determine what is current practice (emphasis on survey),	or	Information gathered to clarify issues involved in change in current practice (emphasis on experimentation).
Information related to a particular single discipline,	or	Information to be used by a multi-disciplinary team.

With regard to the latter distinction, it must be noted that multi-disciplinary teamwork poses a special set of difficulties. Most social scientists are trained within a single discipline, and "problem-solving" is often not emphasized. The reward structure for research usually reinforces those tendencies. A country or region wishing its social scientists to do more work of a problem-solving nature may need to develop appropriate peer groups and reward structures to promote such work.

(From the Beirut seminar working group reports)

INTEGRATING THE ELEMENTS OF A RESEARCH DESIGN

In our studies we have found it easier to *specify* the elements of our research design than to make sure that they

continue to be *integrated over time* as the study progresses. The initial research design explicitly defines for us:

1. The subject on which information will be gathered.
2. The type of information required and its intended utilization.
3. The population on which information will be gathered.
4. The methods by which information will be gathered.
5. The means/organization through which information will be gathered.

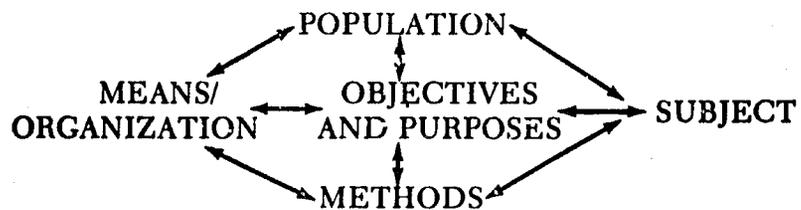
There are good guidelines in most methodology textbooks for dealing with these as individual elements. What is understandably neglected is the difficult task of keeping each element in phase and in harmony with the others. Yet most research workers using survey research methods in developing countries report that this is their most formidable challenge and the source of some of their gravest and most costly errors. For instance:

- Available and known research methods may tend to dictate the subject of the research and the nature of information collected; the research worker is then disappointed to find that the information collected falls short of what is needed to meet his research objectives. For example, in a study designed to increase the effectiveness of extension work he may belatedly discover that the information needed cannot come solely from the responses he has gathered in a survey of farm households.
- He may assemble information that seemed interesting and proved possible to collect only to find that, because the research objectives were ill-defined, the methods and means for analyzing the collected data are not available.
- His criteria for methodological rigor may fail to relate to the purposes for which the information will be used, so that elaborate steps he has taken to minimize sampling or measurement error have cost him much

more effort and expense than the needs of the study justify.

—One element in the design may have been given excessive emphasis at the expense of another (erroneous trade-offs), so that, for example, the research plan generates data of very high quality but only months after they were really needed.

There is no way to provide a blueprint that will avoid errors of this kind. Each research worker achieves (or fails to achieve) integration within his specific situation. It is difficult to do more than provide a handy memory aid to remind him of the interrelated aspects of research design. The one shown below is suggested by I. C. M. Royen ("Gezondheidsagogiek," *Bull. Gezondheidsvoorlichting en Opvoeding* 1(1972)4, 1-6):



In planning a study it is particularly important to give meticulous attention to stating precisely and clearly the objectives (type of information required) and purposes (how it will be used). We have found that a vague definition of these elements inevitably leads to problems later.

Niels Röling, Agricultural University, Wageningen (Nigeria, Kenya)

NECESSARY STEPS IN A STUDY

What steps are necessary if field surveys are to produce reputable results? From my field experience in Nigeria these are the ones I would list:

First, find out what is known about the problem and about the proposed or similar study areas. What have been

the experiences of other scholars in the region? There is no substitute for an extensive review of the literature.

Second, spell out clearly the hypotheses being tested (obviously modifying them in light of additional knowledge), the data to be collected, and the plan of the research.

Third, select villages which have the required characteristics to give the hypotheses a realistic test. The approval and support of local authorities must be gained and rapport established with the community.

Fourth, prepare and pretest the questionnaires and guides for interviewers. Questionnaire design requires an input from all of the scientists who will be involved in analyzing and using the data.

Fifth, train interviewers in the technology of their jobs and the purpose of the survey. The enumerator is the key link between the farmer and the researcher; unless he understands the survey he cannot explain it convincingly enough to gain full cooperation from respondents.

Sixth, if an acceptable sampling frame does not exist, conduct baseline surveys to provide a sampling frame from which the second-stage sample can be drawn. It must be apparent to villagers that respondents are chosen randomly.

Seventh, arrange for supervisors and cooperating scientists to visit interviewers regularly to maintain morale, verify completed questionnaires, respond to problems encountered by enumerators, and clarify any misunderstandings with villagers.

Eighth, verify data, tabulate, and begin to make analyses even while information is still being collected. Researchers must be prepared to modify questionnaires in light of experience gained in the field and with the added insights that come as data analysis proceeds.

Ninth, be prepared to commit an enormous amount of time to ensure that resources are available to the survey teams, administrative questions are promptly handled, and field problems are anticipated and circumvented before they impede progress of the work.

John Flinn, IITA (Nigeria)

A CHECK LIST TO IMPROVE THE USEFULNESS OF SOCIAL SCIENCE FIELD DATA COLLECTION

Increasing the Efficiency with Which the Study is Conducted

- _____ Problem sharply enough defined to permit clear specification of the kind and size of sample needed.
- _____ Problem sharply enough defined to permit clear specification of amount and kind of data to be gathered.
- _____ Exploratory and reconnaissance studies fully used as a guide to economies in sampling (by better estimates of variance) and in data collection.
- _____ Schedule asks no greater degree of precision for an item than proposed analysis of that item will require.
- _____ All possible effort to see that each interview results in a completed schedule capable of being analyzed.
- _____ Data collection instruments designed for maximum compatibility with data processing mode (manual, electro-mechanical, electronic).
- _____ Sampling plan and data collection instrument compatible with analysis plan (contingencies, correlations, etc.); dummy tables or other devices used to test compatibility.

Increasing the Utility of the Product

- _____ Subject of study an important one in which there is scope for findings of practical usefulness.
- _____ Research problem clearly defined to permit specific findings and recommendations.
- _____ Variables include factors that are manipulatable—i.e., factors that can be modified through policy instruments or group action.

- _____ Infrastructural support exists for application of expected findings.
- _____ Time schedule assures that results will be available while problem is still significant, while interest is still high, and before too many irreversible decisions have been made.
- _____ Research plan and budget allow adequate staff time and resources for write-up: for other social scientists and also for other potential users.
- _____ Steps taken to put results in usable form (translation of technical findings, exclusion of data not of practical utility, integration of findings with prior or related information on the subject).
- _____ Steps taken to make data available for possible secondary analysis.
- _____ Personal relationships being developed with potential users of data or findings.

(From the Beirut seminar working group reports)

BRIEF DESCRIPTION FINDS FREQUENT USE

A "one-page-overview" can help decision-making government officers get a clear picture of the purposes of a social science research project. It abstracts the core, the fundamental framework of the undertaking, and displays it in a way which guides the reader toward a good general understanding of the activity. It is especially useful in large-scale, multifaceted action programs involving several ministries and a number of international and bilateral aid donors, development advisers, and experts representing a spectrum of academic disciplines. It outlines the principal program *objectives* to be attained, the main *bottlenecks* perceived as constraining their attainment, and the nature of the *strategies* being contemplated or tried out. It also

suggests the nature and extent of cooperation required from each participating organization.

The most important pay-offs of this "one-page-overview" are that (1) it permits the most fruitful use of the brief interviews granted so infrequently by highest-level officials, sharpening their awareness of the project instead of boggling their minds with the full-length report; and (2) it helps rural sociologists, agricultural economists, public administrators, civil engineers, educators and health scientists to see their development initiatives in relation to, rather than in isolation of or in competition with, each other, thus promoting interdisciplinary co-operation and, with a little manipulation, perhaps even more communal data collection and shared surveys.

Joseph Ascroft, University of Iowa (East Africa)

ADAPTING TO BUREAUCRATIC REALITIES

The limited information-processing capacity of the human decision-maker makes trade-offs necessary. In order to make these trade-offs efficiently, one can, on the purely technical side, employ non-parametric analytical tools and restructure a problem; and on the broad aspects where research interfaces with bureaucratic reality one must use all of one's political instincts aggressively. We can hardly expect that the information base would be so complete, objectives so parallel and constraints so similarly viewed that a good research proposal in the view of one group would be generally accepted by other interested groups. There are enough conflicts in real values, institutional rigidities and information incompleteness to make the interface between bureaucracy and social science as difficult as the more technical aspects.

What we must remember is that research—and especially socio-economic research—cannot be independent of the bureaucratic goals of the sponsoring as well as the recipient organizations. It is often necessary to focus more on the politics of launching a research effort than on the design of the purely scientific part. In a total system

framework, the two aspects are inseparable so far as the goal achievement aspects of research are concerned. And so, among the working rules that will emerge for the largely technical aspects of research design and implementation, let me add some equally relevant working rules for the political aspects of research design. These are:

- a. Do not propose long-term studies. If you do, break them into one or two year phases;
- b. Emphasize the immediate benefits of the research to the sponsoring and the recipient organizations;
- c. Avoid sampling methods that are more sophisticated than the study requires or than your resources permit you to handle;
- d. Involve local skills and interests as deeply as you can.

Tariq Husain, IBRD

OBSTACLES TO COORDINATION OF RESEARCH EFFORTS

Lack of cooperation between different units may result from various reasons.

Some government units lack interest in cooperating—or even in doing research. Most responsible officials are aware that they have problems, but many do little (except talk in public) about the need to find solutions. Some lack qualified staff in their units, or simply do not want people from “outside” (other departments) to know their “secrets.” This may make it very difficult to get additional information beyond what is officially published; everything is confidential.

A lot of office paper work is involved in government. Even if there is interest and willingness to cooperate, projects must pass through a long and very complicated channel before they are finally approved. This discourages people. Even after a project starts it can still be suddenly discontinued for one reason or the other.

Jealousies among researchers are another important obstacle. Some research workers are personally jealous of others, some fail to recognize the importance of other

disciplines. For example, few researchers in biological sciences understand how economics and statistics can be related to their fields of specialization. When there is very little contact between departments or ministries and each ministry has its own department of economics and/or statistics, there is a lot of duplication of effort. There is also confusion and frustration, because different figures are reported for production and yield, for example, for the same province for the same season. In my own country, one unit, the department of agricultural economics and statistics in the Ministry of Agriculture, Food and Natural Resources, ought to be responsible for the publication of all data concerning agriculture. There would still be abundant reason for several agencies or units to cooperate in joint research projects. So far this has seldom been done in Sudan, but joint projects have special value in the developing countries as a way of pooling resources and of making sure that a problem will be studied from more than one aspect.

A. M. El Hadari, University of Khartoum (Sudan)

FORMAL PLANS AID MULTI-DISCIPLINARY TEAM

When working with a multi-disciplinary team a formal procedure of research planning appears to be useful. It ensures that all members of the team see clearly and agree about:

- a. The exact nature and purpose of the project;
- b. The precise responsibilities of each scientist cooperating in the study;
- c. The types of data to be collected and how they will be integrated and analyzed;
- d. The characteristics of the required study area;
- e. The support services and budget realistically required;
- f. The schedule of activities, including starting and completion dates.

John Flinn, IITA (Nigeria)

SIX COMMON STRATEGIES OF DATA COLLECTION

The commonest strategies of data collection in socio-economic research would include:

Survey research, where an interviewer makes only one or very few visits, asks questions, and records responses.

Cost-route, where an enumerator or interviewer makes multiple/frequent visits to overcome problems of recall and describe changing or dynamic situations and operations. A special type involves the use of farm record (account) books.

Participant observation, where the research worker relates very closely with his respondents and may help them in their tasks (i.e., classical anthropological approach).

Non-participant observation, where the respondent is aware of the research worker who, however, does not participate but observes "from a distance."

Direct measurement, where field sizes, yields, etc., are measured by the researcher himself.

Group interview, where a number of respondents are interviewed together, usually only once, and an attempt is made to elicit a consensus (or, in some cases, an average).

One visit/one-shot *survey research* is usually the approach chosen:

1. If the time/cost constraint is a serious one.
2. If sensitive data are sought of a kind on which it is difficult to engage people in frequent discussions.
3. If you do not trust that your enumerators will continuously record correct information during repeated visits.
4. If the data to be collected deal with phenomena that change slowly, e.g., land tenure patterns.
5. If the totality of a phenomenon is observable at a

single time (single point).

6. If specified and limited data are needed to fill a gap existing in data already collected.
7. If the event under study represents a single occurrence for which there is an optimal timing for a single interview.

The *cost-route approach*, which can be viewed as a sort of multiple-visit survey, is usually used:

1. When “perishable” information—incomes, expenditures, etc.—is sought in the field, and continuing accuracy and reliability are needed.
2. When the researcher is interested in the changes in a phenomenon which take place over time.
3. When there are no records or the subjects have no recording system; i.e., if literacy is low.
4. When the phenomenon is not observable in its totality (continuous).

One-visit surveys are better carried out at the completion of the phenomena examined. In any survey, the researcher should plan on a lead time to make sure that he does not miss the totality of the problem. It may be advantageous to start multiple visits with a preliminary one-shot survey to give an idea about the study area and the problem. Where multiple visits are used, interviewers should be closely supervised.

Observation, although traditionally mainly used by anthropologists, is a method basic to all research:

1. In areas where there are no records of any sort, thereby necessitating the development of benchmark studies.
2. In areas where there are high rates of illiteracy, a factor related somewhat to (1).
3. In areas where the researcher is interested in a whole cycle of activities pertaining to the culture of the people.

Participant observation aims at giving the researcher qualitative material through the medium of actually taking part in whatever activities, way of life, etc., he is interested in. He usually defines ahead of time much of what he is interested in, and consequently is better able to extract from the diverse phenomena he observes. (Researchers committed to mobilizing the participation of community members in the research will modify this approach in some important ways. General areas to be investigated will be defined beforehand, but the parameters are filled in by the researchers and members of the community working together. The research worker will be expected to provide continuous feedback on his observations to the members of the community. There will be explicit recognition that this kind of research often will *change* the reality being investigated, not simply describe it.)

The participant observer usually does his recording or notetaking only when he is alone or back at his base or residence. In a majority of cases he will live in the community long enough to observe the whole cycle of its activities.

Participant observation is a formal means of obtaining data in anthropology. Its obvious advantage is that researchers can actually watch and record what people do, not just what they say. It presumes knowledge of the language of the subjects.

Non-participant observation requires that the researcher find a way of being separate from the action while he observes. Many social scientists use this informal or indirect way of collecting data. During the non-participant observation stage, the researcher can take notes or only observe and record later on.

In any observation technique, the observer should try to be as unobtrusive as possible. If he becomes an over-intruding element, the reliability of the observed data will be affected. In fact, he should be aware that whether he is intrusive or not his mere presence will modify the behavior of the people.

(From the Beirut seminar working group reports)

WHEN IS COST-ROUTE METHOD APPROPRIATE?

With the cost-route method, farmers are interviewed repeatedly, usually once or twice a week for at least one crop season. Precise information is gathered on resource use, costs and returns. Only a small number of farmers can be interviewed by each enumerator, so that cost-route surveys are more expensive for a given sample size. Thus, sampling errors might be large. Sometimes it may be necessary for a farm business survey to precede a cost-route survey; this may help to reduce sampling errors.

A single-visit farm business survey is a quick and relatively cheap way of determining the range of conditions found on farms. Main drawbacks of this method are that the observational errors can be quite large, since only a few visits are made to each farmer, and accurate data will not be generated on alternative resource uses, especially with respect to labor inputs. Thus, when the subject of study is the returns to labor and other resources or the relative profitability of different crops, this method should not be used. For such detailed input-output studies, the cost-route method is required.

In a cost-route survey, field enumerators have to interview farmers without interruption, once or twice a week, for at least one crop season or for a full year. Therefore, arrangements must be made in advance to safeguard the continuity of the survey and to minimize incomplete data collection. If an enumerator gets sick, needs to see his family, or abandons his work, a standby enumerator must be ready to take his place. This can be a field supervisor, a surveying aide, or a reserve enumerator hired for this purpose.

Eric Tollens, National University of Zaire

We do not believe the single visit technique is adequate to collect the flow-type information useful for detailed quantitative analysis of socio-economic systems unless the system being investigated is very simple, with regular

operations, or the respondents are literate and have records to which they can refer. Our rice production and rural employment surveys in Sierra Leone have, therefore, used the multiple-visit or cost-route technique. We chose that technique because of:

1. *Literacy*—The vast majority of respondents we have studied are illiterate, keep no records, and must rely on their memories for required information.
2. *Complexity of the information needed*—Detailed analysis of variations in farming and non-farm processes calls for detailed information on daily family and hired labor inputs, capital and other inputs, and output.
3. *Availability and wide use of the Moslem prayer time*—Moslems pray five times a day, the time determined by the position of the sun. Even in non-Moslem households we have found that respondents know the Moslem prayer times. The prayer time therefore provides a method of estimating the labor input in hours in traditional farming communities. But to use it effectively an enumerator needs to find out when an operation started and was completed in relation to the prayer time. This is not possible if the single visit technique is used.
4. *Length of memory recall*—Length of memory recall is limited; in the rice production study, labor use was recorded in man-days and respondents were interviewed weekly.
5. *Short duration activities*—Some activities (e.g., hand pounding of rice for family consumption) are performed regularly and take only a short time (usually less than an hour). For such activities estimation of labor input using the Moslem prayer time may lead to major inaccuracies when aggregated. Sample time and motion studies are therefore planned for such activities.

Dunstan S. C. Spencer, University of Sierra Leone

"TRACER INTERVIEWS" FOLLOW PEOPLE AND GOODS

Instead of depending on interviews at a single time and place, the "tracer" approach makes use of successive interviews and observations, in different locations, to get a better picture of a process or movement. Tracer interviews or tracer exercises for collecting data must be considered in any study involving movements of people, commodity flows, marketing, and other phenomena connected with spatial interaction.

Although tracer interviews can be very taxing and expensive they often provide fresh and exciting new insights and can increase the accuracy with which phenomena are described. For example, in a study carried out in 1968 on cash cropping in Yendi District I found it useful to trace the flow of some foodstuffs to major markets. It was valuable to learn how farmers selected among alternative markets for particular products and to trace the variations in the pricing system for the same consignments of foodstuffs as they moved from market to market.

Tracer interviews or exercises can never be rewarding if the intentions of the exercise are not explained to the people involved. Many people get very wary, and rightly so, of researchers who "pester" their lives without first capturing their confidence and sincere co-operation. Also, wherever possible tracer interviews should be carried out by the principal researcher himself. Where it is necessary to use field assistants they should be very capable people who are working closely with the principal researcher.

John S. Nabila, University of Ghana

A Plea for Experimentation

I view the preferred data-gathering strategy as following a three-step time sequence: informal interviews, followed by surveys, followed by field experiments. One cannot do a good survey without elaborate informal efforts to specify problems, identify operationalizations, etc. The survey allows quantification and provides a "benchmark" for further studies. What the survey tells us about relation-

ships among variables can then provide a basis for experiments in which we test, realistically and constructively, our theories about the modernization of traditional agriculture and development in the rural sector.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Make Difficult Problems Less Data-Intensive

My most important working rule would be to reformulate difficult problems to make them less data-intensive and/or appropriate for other known solution techniques. In so doing, I would urge that we should not ignore the rich field of probabilistic formulations.

Tariq Husain, IBRD

Factors Influencing Data Collection Strategy

The fundamental factor underlying the choice of a data collection strategy or combination of strategies is the objective or aim of the study. This choice will, however, be modified in light of resources available and other operational considerations:

- a. The disciplinary orientation of the researcher.
- b. The kinds of inter-disciplinary cooperation required.
- c. The availability of private, public or institutional records in the study area.
- d. Related to the records available, the level of literacy in the area.
- e. Financial resources for the study.
- f. The potential for collecting satisfactory data with enumerators of limited educational levels.
- g. Time available to undertake the study.
- h. Whether the type of system (usually farming) in which the study is to be undertaken is complex or simple (e.g., year round versus seasonal farming, mixtures versus sole stands of crops, etc.).

- i. The potential of the method for reducing:
 - 1. Sampling error
 - 2. Measurement error
- j. The type of data required, based on:
 - 1. "Single point" to "continuous" continuum (relating to an event or activity that occurs over a brief time span, as against one that has much longer duration).
 - 2. "Registered" to "non-registered" continuum (relating to an event whose occurrence and dimensions leave a written record or distinct and vivid recollection as against one less likely to be recorded or remembered).

Other things being equal, measurement errors tend to be lower with single point registered data (when memory recall would be good) and higher with continuous non-registered data (when memory recall would be bad).

A very rough effort to describe the six data collection strategies listed earlier in terms of applicable *operational constraints* may be of interest. In the table that follows, the significance of each operational constraint with respect to each strategy is given a ranking of 1 to 6, with "1" indicating a very favorable ranking and "6" indicating a very unfavorable ranking. The largely subjective rankings based on consensus of the discussion group are given in the table that follows.

Operational constraints often necessitate the use of a combination of strategies (e.g., survey and direct measurement). As the table shows, no one method of data collection is basically superior in terms of minimizing operational constraints.

Minimizing measurement errors (particularly with continuous non-registered data) is very expensive and time consuming. As a result this should not always become a preoccupation of the research worker; rather, the aims of the project should be carefully evaluated to ascertain what level of precision is justified. Research is needed to determine the increase in measurement error (e.g., on labor

time) as a result of interviewing at progressively longer intervals after the actual event. In this respect the influence of "learning" in memory recall in frequent interviewing over a long period of time must be considered.

Evaluation of data collection strategies in terms of cost per unit with respect to various operations (1 = lowest cost per unit, 6 = highest).

Constraints	Strategies					
	Survey	Cost-Route	Participant Observation	Non-Participant Observation	Direct Measurement	Group Interviews
Finances	2	3	6	4	5	1
Ability of enumerators	3	3	6	4	5	4
Time required	2	3	6	4	5	1
Type of system						
Simple	2	1	1	1	1	2
Complex	5	2	1	1	1	6
Errors						
Sampling	1 ^a	3 ^a	5 ^a	5 ^b	5 ^b	6 ^b
Measurement						
Single-point registered data	3	2	1	1	1	3
Continuous non-registered data	6	2	1	1	1	5

a = evaluated in terms of ability to *reduce* sampling error
b = evaluated in terms of ability to *specify* sampling error

(From the Beirut seminar working group reports)

II. PRELIMINARY STEPS: AREA FAMILIARIZATION AND RECONNAISSANCE OR BASELINE SURVEYS

STEPS IN "AREA FAMILIARIZATION"

Too few researchers know what they will measure before measuring. Too few have tested their instruments. Too few have carefully identified the problem before tackling it. Area familiarization consists of:

1. Reconnaissance surveys (getting to know the place)
2. Farm business surveys
3. Talking to key informants (farmers, retired officials, "experts," government officials, priests, etc.)
4. Literature search (records, theses, national archives, etc.)
5. Pretesting questions, developing answer categories, etc.
6. Pretesting data collection methods.

Area familiarization is especially essential for outside researchers. But local researchers often also assume too much similarity between their own villages and the ones they are going to study.

Area familiarization includes or has some bearing on other key steps that may be required for a successful study. Thus it must be done with some thought about research clearance, permission from local authorities, permission from traditional authorities, and legitimization by other powerful agencies or individuals in the community.

(From the Beirut seminar working group reports)

LOCAL KNOWLEDGE SHARPENS QUESTIONS, HYPOTHESES

Knowing the environment in which the phenomena studied take place is a prerequisite to any successful study.

In 1967, when I had just graduated from college and knew hardly any economics, I spent the summer at the Institute of Applied Economic Sciences (ISEA) in Tunis. The ISEA economist gave me the responsibility of gathering primary data that would permit a benefit-cost analysis of an irrigated sub-sector.

We agreed as to the basic economic entities for which we wanted data, but the precise questions to ask, areas to survey, and choice of farmers to interview were left to my judgment. After a month I found that at least half the questionnaires I had filled out with farmers were useless because in the early stages of the survey I came to realize that I had failed to ask many important questions bearing upon the variables I was seeking to quantify.

Further surveying was also needed to get a representative sample of farmers, because when I started the survey I was not aware of how heterogeneous farms were, both within each locality and among localities.

I have since found it quite useful to visit with farmers and agronomists before undertaking surveys at the farm level, and to visit with marketing people, sellers, and buyers before starting a marketing survey. One would be surprised at the extent to which such contacts can sharpen one's ability to ask the right questions in the right form, to avoid embarrassing statements, and to make sure one is studying the right problem.

It is easy for a western-educated economist to assume that the significance of any economic force is the same in a developing country as in the economy he knows well. This is often not the case. Even though one starts out with hypotheses as to the phenomena to be studied, it is useful to have an open mind and be prepared to think in terms of *local phenomena* rather than *Western phenomena studied with local data*. This requires one to sharpen his ability to develop hypotheses based on realistic information he can

acquire about the environment in which the phenomena take place.

Salem Gafsi, IBRD (Tunisia)

REALITIES OF RESEARCH COME FROM THE FIELD

Although a thorough review of existing literature on the study area and similar projects will help in the formulation of hypotheses and a determination about the feasibility of the study, it is the *reconnaissance survey* which gives the researcher a feel for his project in the field. Experience has often shown that the realities or key concepts of a study reveal themselves in the field more surely than in previous studies. The reconnaissance survey should help to direct the choice of exact research techniques, the determination of sampling type and size, and the drawing up of a questionnaire or an interview schedule. If properly undertaken, it should also help the researcher to determine the type and number of interviewers he will require and to foresee their logistic needs:

- a. Mode of in-country travelling,
- b. The nature of a first aid kit,
- c. The adjustments to make in dietary or eating habits,
- d. Accommodation arrangements,
- e. The nature and types of field equipment (water bottles, kerosene lamps, kerosene cooking stove, sleeping bags, mosquito net, cutlery, stationery, etc.).

Finally, the reconnaissance survey should promote the establishment of preliminary contacts with important ethnic (traditional) leaders, family heads, administrators, opinion leaders of all types, traders, and other individuals in the project area.

In many rural areas in Ghana, the success of any fact-finding project will depend on how ready the researcher is to abide by or respect the customs and way of life of the people. This does not necessarily call for one to become a 100% participant observer. As a matter of fact, many people easily accommodate a researcher who realizes that there

can be both beauty and unity in diversity and who, although aware of the ways in which his culture is different from that of the study area, aims at achieving some level of homophily with the people he is studying.

John S. Nabila, University of Ghana

Build Knowledge of Usual Farming Practice

Prior to and during the baseline survey of the selected villages information is sought on typical systems of farming, calendars of agricultural operations, crop yields, the farmer's perception of factors which influence yields and family income, the mode of operation of the market, local names for major soil types and crops and measures, village history, important feasts and other social events in the village.

This class of information is vital to broaden the researcher's understanding of the environment, technology and society in which he is to work. It also demonstrates to the villagers the researcher's real interest in their problems and agricultural activities.

John Flinn, IITA (Nigeria)

FARMING PRACTICES AFFECT SURVEY PROCEDURES

As part of field preparation, a pre-survey investigation in the designated area probes into local farming to allow proper questionnaires to be drawn up. It seeks these kinds of information:

1. *Attributes Common to Most of the Farm Population Under Study*

Soil conservation, fertility maintenance, crop associations, the relation of crops to particular soil types, methods of acquiring new land, inheritance rights related to cattle and land, the food calendar, and menu information at different times of the year. If these facets of traditional agriculture are common to

members of a single tribe growing the same crops and using the same tools and methods, they can be described by a single interview with an informed local person.

2. *Social and Customary Constraints Likely to Restrict Resource Re-allocation in Farming*

For example, the rights of communal grazing of cattle over crop residues would preclude the use of maize stover for intensive feeding. The rights of the women to sell a by-product from the traditional method of processing would balk the introduction of new processing techniques. Sex-differentiated labor use inhibits full utilization of family labor capacity on affected operations.

3. *Observation and Measurement Problems to be Contained by Survey Design*

Complexity in the farming system may restrict the use of some data collection techniques. For example, some areas have continuous cropping or two planting seasons and interpenetrating cropping, particularly on the same land. In such areas the reference period for questioning is obscured and frequent farm visits are required to give accurate information. In systems where the same crop is grown under two or more management regimes which must be independently represented in the planning model, plot yield cuts are normally the only approach to the collection of output data. Where the output of an important enterprise is irregularly sold on an unrecorded market, frequent visits to the farm are required to cover sales effectively.

4. *Effective Structuring of the Survey Questionnaire*

Correct phrasing of questions and structuring of the table heads and answer spaces depend on knowing what is done on local farms, particularly with regard to crop types, management regimes, capital assets

employed and labor organization. For example, some capital assets are built by family labor, and the questioning required to elicit details of such investments is different from that needed for purchased assets.

Michael Collinson, Commonwealth Development Corp.
(East Africa)

Crop Research Workers Add Valuable Background

Commonly agricultural research staff have greater continuity of service in a particular area than their extension counterparts. Consequently, we have found research scientists a particularly valuable source of detailed information on the problems of an area. To illustrate this process with the Teso study: the field team visited and had a number of interview sessions with the scientists at the University Farm, Kabanyolo; the Cotton Research Station, Namulonge; Government Research Station, Kawanda, and the Agricultural Development Center, Namalere. While in Teso district, we had two sessions with the scientists at the Serere Station. This procedure was repeated for each district study.

Victor Uchendu, University of Illinois (East and West Africa)

UTILIZATION OF HISTORICAL SOURCES

The historical method of social science data collection employs secondary sources of data to examine and help explain a problem. This method is often referred to as "desk work" and includes the review of the literature. Some research problems can only be understood through the study of historical records. Records in National Archives, museums, libraries, churches, and government departments and data from individuals and oral tradition can all be used for this method.

Whatever research procedures are employed, the introductory steps should involve some historical approach. Records, other research results, etc., on the area being

studied should be consulted. But the current user of records must be aware that the *writer* and the *provider* of the material were not necessarily the same person. The big question is, "How reliable is the source one is using?"

Some surveys, e.g., farm management studies, may require *situational* analysis. The historical approach lends itself well to the achievement of such an objective.

At times it will be helpful to check some of the less obvious kinds of records such as newspaper files, hotel registers, private correspondence, etc. (if they exist and are available to the researcher for extracting useful data).

(From the Beirut seminar working group reports)

III. CONSIDERATIONS IN SAMPLING

CHOICE OF SAMPLING METHODS

At an early point the social science research worker will have to decide which of various sampling methods is most appropriate for his study:

1. *Non-probability samples*

- (a) Accidental (data from whomever you meet)
- (b) Quota allocation of different numbers of interviews to different groups in the population, with individuals to fill each quota not chosen by random methods
- (c) Purposive (choosing individual units of study on the basis of judgmental criteria)

2. *Probability samples*

- (a) Random (use of random numbers)
- (b) Systematic (every n th)
- (c) Stratified (as in quota sampling, but with random or systematic selection within groups)
- (d) Multi-stage (random or systematic selection of villages, areas, or other large groupings; random or systematic selection of individual respondents within each selected grouping)

3. *Combinations of probability with non-probability sampling*

Probability and non-probability methods of sampling will often be used together; e.g., in multi-stage sampling one may select areas on purpose, pick out villages in each area at random, and choose villagers in each village at random.

In what situations would non-probabilistic samples offer advantages?

1. In a homogeneous population, or under assumed homogeneity (describe one unit and you describe all).
2. When not interested in representative description of population; e.g., when asking whether a phenomenon occurs at all, seeking typical cases for illustration or training, identifying problems, devising answer categories, or generating hypotheses.
3. When describing systems or institutions of which there are only a few, so that statistical procedures are not called for (e.g., when the unit of analysis is the village which you study).
4. When a sampling frame is unavailable or too costly, and when the statistics background to exploit fully a random sample is not at hand.

On the other hand, non-probabilistic methods cannot be relied upon to give a representative picture so that you can generalize to populations and infer from data, and do not permit use of significance tests to establish relationships.

Probabilistic sampling is useful because:

1. Without a probabilistic method of sampling one cannot with assurance extend his conclusions to a larger universe, and positive conclusions that must be limited to the sample population are usually of limited utility.
2. In case of random sample, once you have the sampling frame you don't need to know more about the population.
3. When you can assume random selection of the sample you can consider a great many useful statistical techniques to make inferences about the population.

Among the limitations that restrict the use of probabilistic sampling, the principal one is the need for a *sampling frame*, or listing of units from which the sample can be

drawn. In rural areas it is seldom easy to provide this listing of all data collection units in the population; developing an adequate sampling frame is thus the main problem of field work in Africa. One can try to use existing frames (census records, crop records, tax lists, etc.). These are usually inadequate, especially at the local level. Usually you don't know how inadequate they are.

It is also by no means easy to be sure how representative a probabilistic sample really is, especially if its size was limited by external constraints. There are no satisfactory techniques to determine minimum sample size for a large number of variables, especially if measurement of each unit of study is very expensive, as in cost-route studies. Stratified sampling can be used to overcome some of these problems when one has a great deal of knowledge about the population, but such knowledge is seldom available before one carries out the study. When you aim to draw inferences about a population, your best bet is random or systematic sampling, investing whatever effort it takes to get as adequate a sampling frame as possible.

Multistage sampling often permits one to arrive at a sampling frame when existing records do not allow constructing one. One moves to a higher level where better frames exist (lists of villages, for instance) to draw a random sample of larger units (area grids, villages, farming units, etc.). One can then move down and develop a complete frame (through carrying out a census) in each such unit selected for the sample. When making a frame (doing a census), it is possible to ask additional questions for purposes of stratification.

A good sample can be used more than once for different purposes. Developing a proper frame and drawing a reliable sample is probably one of the greatest difficulties and efforts in data collection in rural areas. Once that job is done well, multiple use of the sample is possible and data on personal characteristics gathered the first time do not have to be collected a second time.

Specifying the *unit of data collection* often has a bearing on sampling methods used. In the African context it must

be clear whether key inferences are going to relate to the family, household, "farmers," compound, decision maker, consumption unit, production unit, migrant, etc. It is important to remember that:

1. The unit *from which* data are collected may not be the same as the unit *on which* data are collected: the former may not know all about the latter.
2. Definition of unit of data collection should follow, as much as possible, local practice and custom. (Don't impose a nuclear family farm on a society it does not describe.)
3. The definition should allow the field-worker to recognize a unit of data collection when he sees one.

Various constraints keep the social scientist from reaching all of the objectives in his research. In the case of sample size the key constraints are:

1. Time
2. Money
3. Type of area
4. Type of data handling facility
5. Available trained personnel

Many such constraints can be specified in a reconnaissance survey.

Criteria for determining sample size usually depend on the amount of variation in the variable you wish to study. The problem is that you don't know how much variation there is in any variable beforehand, and also that you may use many variables that vary in variability. Amount of variation can to some extent be estimated from a reconnaissance survey.

Constraints are usually determinant for sample size (especially for cost route type studies). In case of one-shot surveys, there are handy tables which give a rough idea of the expected variation around the mean with different sample sizes. For an N of around 400, you are usually within the $\pm 5\%$ range at 5% cutoff.

(From the Beirut seminar working group reports)

HOW BUDGET INFLUENCES SAMPLE SIZE

Since cost-route surveys are expensive and time consuming, the budget constraint usually determines how many farmers we interview. Usually, our reasoning goes as follows: "I dispose of or will apply for a budget of u \$, of which enumeration salaries will take up v \$. Each field enumerator will cost w \$; thus, I can hire $v \text{ \$} \div w \text{ \$} = x$ enumerators."

The number of farmers each enumerator can handle depends on how many visits are to be made to each farmer per week, the dispersion of the farmers, the means of transport available to the enumerators and the size of the enumeration area. When we know that each enumerator can be expected to interview y farmers, we know that the sample size will be xy . But this approach does not make it easy to plan in terms of how representative the sample will be of the universe.

In our cotton farm business survey, my field research budget enabled me to hire four field enumerators to cover the northern cotton zone—an area of 800 miles from east to west and 200 miles from north to south. Since each enumerator could only interview 40 farmers during planting and harvesting periods, I ended up with sample of 160 farmers.

The cotton farm business survey cost \$48.00 per farm record. This includes salaries, transportation and equipment of field enumerators and supervisors and in-country transport, equipment and other expenses of the project leader, excluding his salary. Travel expenses, depreciation and maintenance of a landrover and three motorcycles and a bicycle accounted for just over half the research budget. The dispersion of the cotton farmers and the extensive traveling on bad roads by enumerators, supervisors and the project leader explain this.

Eric Tollens, National University of Zaire

LIMITED KNOWLEDGE OF VARIANCE A PROBLEM

In practice, especially under African conditions, it is rarely possible to follow textbook procedures for determining sample size without heavy expenditure of time and finance. The biggest problem is often encountered in taking a decision on the correct sample size. It is almost certain that no prior knowledge of the variance of many of the items to be measured will exist at this state of the arts in Africa. The size of the population being surveyed is in many cases also not known with any degree of accuracy.

In Sierra Leone we have not thought it expedient to devote much time to calculating the "correct" sample size. Our sample sizes have been determined by the availability of funds and the data collection strategy we have chosen.

Dunstan S. C. Spencer, University of Sierra Leone

THE COST OF GREATER ACCURACY

With fixed resources for investigation, the compromise is between sampling error, decrease of detail in data collected from the farm, and complexity of farm situations. Greater detail or complexity demands more frequent visits and, with a fixed budget, a smaller sample. The use of alternative data collection techniques can offset the need for more frequent visiting but bring problems in the control of observational errors, in part from greater reliance on the memory of the respondent.

The table below shows the cost of increased accuracy. In practice I have felt it necessary to have a standard error no larger than 7.5% and 10% on parameters judged to be important for the planning model. I should be interested in further discussion of levels of accuracy to be sought in investigational work.

Level of Precision (% Standard Error)	Sample Size	Costs Per Area Covered	
		Single Visit £	Daily Visit £
10	100	2,000	12,750
7.5	180	2,900	20,700
5	400	5,600	42,400

NOTE: It has been assumed that coverage of areas under the single visit design is reduced to two per year in improving precision below a 7.5% standard error. Costs are based on the levels of 1970.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

WHY STRATIFICATION PERMITS ECONOMIES

Statistical theory helps determine sample size for a particular survey only if we can specify the variances of the variables we are interested in and the degree of accuracy of the estimates we want to derive. This is particularly feasible for problems where only one variable is handled, and less feasible in production economics and farm management research, where all problems involve several important variables to be quantified (for instance, labor utilization for different crops, yields of the crops, prices received, capital used, age of the farmers, wage rates for hired labor, etc.). This complicates the application of statistical theory, and only if we are prepared to pay attention to estimates of the variances of all the important variables in the survey can we apply formal statistical procedures in seeking to achieve representativeness in the sample.

The purpose of stratifying the population before sampling is to reduce the variances of the statistics to be generated by the survey. Hence we try to select strata so that

the variation *between* strata is as large as possible and hence the variation among farms *within* each stratum is minimized. To the extent we succeed, accuracy of estimates from a sample survey is increased and we can get the required degree of accuracy from a smaller sample.

Stratification means dividing up the population with respect to one or more of the characteristics which are assumed to be important parameters in the study (crop production systems, climate, soil type, size of farms, characteristics of the farm operators such as age, sex, tribal affinity, farm incomes, distances from marketing centers, etc.). Random sampling is then done *within* each stratum and the resulting sub-samples are pooled to serve as a random sample of the whole population or universe.

In a country such as Zaire, data are readily available on ecological areas, climate, soil types and distances to marketing centers. However, scant information is available on such other characteristics as farming systems, crop varieties, planting and harvesting dates, crop rotations, and use of modern inputs. Therefore, a preliminary farm business survey may be needed to find the economic bases for stratification.

Eric Tollens, National University of Zaire

AREA STRATIFICATION REDUCES RISK

Although it usually is impossible to pre-determine a "correct" sample size, the risk of having an unrepresentative sample is reduced by using *areas* as well as *farmers* in a stratified sampling procedure.

For our farm production study we first divided the country into resource regions (type of farming areas) using available secondary data. Each resource region was then subdivided into the enumeration areas used by the Central Statistics Office for the 1963 population census. (Each enumeration area is about 10 miles square and contains about 200 farm families, located in one to ten villages.) The occupational distribution and the 1963 population of each

enumeration area being available, we were able to screen out all areas falling into or containing urban areas (defined as localities with more than 2000 people and more than 50 percent of the labor force engaged in non-farm activities). Three enumeration areas were then selected at random to represent each resource region.

The next stage was the preparation of a list of households in each selected area. In this exercise enumerators visited all households in all villages in the selected areas, recording the name and sex of each household head and the crops grown or non-farm occupation of the household. From these lists a stratified sample was drawn at random for each area, consisting of twenty farm households and four non-farm households (excluding traders).

The number of sample units selected in each enumeration area (24) was limited by a previous decision to station one enumerator in each selected area and the fact that one enumerator could only handle about 24 respondents using the data collection strategy selected. Since the resource regions varied in size, the percentage of rural households sampled in each resource region varied from about 9 to 31 percent.

Dunstan S. C. Spencer, University of Sierra Leone

Indirect Measures of Stratification Criteria

We have had some preliminary experience with an effort to draw a stratified random sample in each village based on a land-per-resident ratio. With this in mind aerial photographs were taken of most villages in the middle of the dry season (February or March), when the vegetation cover is at its lowest density. An area of 36 square miles centered on each village was flown at a scale of 1:10,000. Two-diameter enlargements of a limited number of photographs were made for use in the field. The boundaries of the fields farmed by each individual in the frame were delineated on the enlarged aerial photographs through the research worker visiting each field. Unfortunately, time limitations prevented us from completing all of the estimates of farm

sizes prior to commencement of interviewing the sample farmers at the start of the planting rains in April.

In our "guided change" project another method of stratification is being attempted. Past surveys show that a reasonably good approximation of the size of a farm business can be obtained by asking a number of output questions (e.g., the number of bundles of millet harvested last year, the number of bags of groundnuts produced, etc.), which can form a basis for a ranking system reflecting size. These questions were asked at the same time as our demographic survey, and a stratified random sample has been drawn based on this proxy variable for farm size. Whether this will be successful remains to be seen. However, such an attempt was necessary because in this project sampling percentages are lower, due to smaller samples being selected in villages in which there was no restriction on population size.

David Norman, Ahmadu Bello University (Nigeria)

Knowledge of Structure of Farming Useful in Sampling

Individual farm households often vary a great deal with respect to such attributes as the use of hired labor on a permanent or temporary basis, ownership and control of land and farm implements, and off-farm economic activities. Such household attributes are related to group and strata formation in the rural community, and may serve as indicators of the level of differentiation or stratification in the area. Where preliminary investigation indicates that variations of this kind exist it may be advisable to use stratification in sampling to see that each group is properly represented; in any case it will be important for the research worker to know to which group each sample household belongs.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

STEPS IN MULTI-STAGE AREA SAMPLING

Sampling textbooks were not written with the developing countries in mind. There are usually no sampling frames, no central registry of all citizens, no census tracts with home addresses, no comprehensive directories of who's where. If any of these exist, they are likely to be unreliable except possibly in some urban areas. An entire village of rural folk of East Africa may share a common address—that of the headman, chief or school-teacher. Adding to the problem is the fact that East Africans usually do not live in concentrated little hamlets, but rather scattered over the countryside, each family on its own five or ten acre farm. To draw a reliable random sample from such a population means creating a sampling frame from scratch.

The best method I have found consists of at least two sampling stages: (1) area sampling consisting of a random selection of, say, 10 percent of the geographic areas in which my study population is to be found; and (2) farm-family sampling which consists of a random selection of, say, 10 percent of the families living in the areas chosen in the first stage.

To draw an area sample, one needs aerial photographs. All of the countries with which I am familiar in West, East and South Central Africa have more or less up-to-date aerial photographs covering most of their rural areas.

Step one is to divide the map of the study location into a matrix of grid-squares, the size of each square being dictated by the distance between the aerial photography runs. Each grid-square is numbered in "serpentine" fashion. Finally, every "nth" grid-square is selected from a random start, the skip-interval being determined by the sampling fraction.

Selected grid-squares must be locatable on the ground, and the coordinates of a grid square are not, unless you are a photographer. So before leaving the map, I distort each grid square so as to fit it to findable landmarks in its immediate environment—a tree, hut, bluff, rock, creek, path and so on.

To make up the sampling frame for farm family selection, the interviewers locate each grid-square or area chosen and then systematically list every farm-family living in it. This is an easier task than it sounds, especially if your enumerators are already familiar with the study area. To make a 10 percent listing of 52,000 farm families living in one division of Kenya, only two weeks using 14 enumerators and one Land Rover were required.

When these lists are all compiled, one can proceed to draw a random sample by taking every "nth" name on the list from random start.

Joseph Ascroft, University of Iowa (East Africa)

Multi-Stage Random Sample Cuts Cost, Improves Control

The multi-stage sampling method we have used assures every household in all villages with 2,000 population or more an equal probability of selection. In Turkey there are 67 provinces, 540 districts and approximately 36,000 villages. In our first stage, two districts from each province were randomly selected. In the second stage three villages were randomly selected from each chosen district. In the third stage 10 households were selected in each village, using random sampling methods. Therefore our sample size was 4,020 households.

The reason for choosing villages from only two districts in each province was to establish a good control system during the survey process. It would have been possible to select villages at random in each province without stratifying by district. However this would have made interviewing more expensive and control more difficult.

Omer Gucelioglu, State Institute of Statistics (Turkey)

Clustered Samples Save Travel Time

In Zaire, because of low population densities in rural areas and consequent low degrees of land occupation, agricultural production is spread out over very large areas. Clustered or area sampling can thus help to reduce

enumerator travel time and save on travel facilities.

This involves at least a two-stage random sampling procedure. In the first stage, villages or clusters are randomly chosen from a frame of all villages. In the second stage, household units are randomly selected from a list of all household heads in each chosen village.

A shortcut is to select the representative villages using subjective judgment, and to random sample only after selection of these villages. This supposes a good prior knowledge for choosing the representative villages and a small inter-village variability relative to the intra-village variability. However, in a system of shifting cultivation with modest capital being used by farmers, wide variations in resource use and product combinations do not occur. This makes it easier to choose representative villages in a non-random way.

Eric Tollens, National University of Zaire

Random Sampling at the Area Level

Stratified sampling can be a good way of assuring representation of various groupings. For example, in a study of private pump schemes in the Blue Nile province we divided the schemes into groups according to their size (area covered). From each group a sample of schemes could then be selected at random in proportion to the number of schemes within the group. Within each scheme the sample farmers were also selected at random.

A. M. El Hadari, University of Khartoum (Sudan)

Getting Data for Area Sampling

Whether sampling is strictly random or stratified on an area basis depends to a large extent on the use to be made of the data and the presampling information available on the population. In our study of the farmers of Kwara State, no relevant information was available. A quick situational survey provided some basic information. Stratified sampling could then be based on ecological zones likely to

have uniform production patterns and soil characteristics, and also on formal administrative units or boundaries.

O. Ogunfowora, University of Ibadan (Nigeria)

"Farming Type Areas" Useful in Sampling

In the absence of an "ideal" situation, we have sometimes found it advantageous to divide the investigation area into "homogeneous farming type areas." Within these, logistically accessible "typical micro-areas," small enough to allow for complete listing of farmers, are selected. From these, the sample of farmers is taken. A sample size of 25 to 30 farmers is regarded as sufficient in cases where the overall variations within the micro-area are not great; this number is also considered the maximum that one enumerator could handle in terms of surveys employing bi-weekly recording intervals.

Karl H. Friedrich, FAO (Tanzania and Ethiopia)

ADMINISTRATIVE AREAS: A DOUBTFUL SAMPLING BASE

Many farm surveys are based, usually for convenience, on administrative areas. This has advantages, because the departments implicated in survey execution and in the implementation of extension programmes are almost invariably organized on this basis. Unless the study is to be used as a basis for policies that are based on these administrative areas, however, dependence on them in sampling can have serious disadvantages. An administrative area may cover a variety of farming types, tribes, and agricultural techniques. This important source of variation will be reflected in the sample and will thwart the diagnosis and solution of farm problems on an area basis.

Type-of-farming areas that represent a pre-stratification of the traditional agricultural economy will ensure more effective sampling because they will represent (relatively) more homogeneous populations. In the absence of survey resources to cover all types of farming areas, they also

provide closed units which can be compared on economic criteria to give an order of priority for farm management investigations. When type-of-farming areas cover several administrative areas, and with sample size determined by the variability and not the size of the population, using them in the sampling plan can mean considerable saving in research efforts.

Michael Collinson, Commonwealth Development Corp.
(East Africa)

Maps as a Starting Point for Area Sampling

Area sampling for Ascroft's studies in Kenya (Vihiga and Kisii) began with maps of a scale of 1:50,000. These were divided into grid squares of about one-third of a square mile each. About 100 of the squares were randomly selected. For each square a list of farmers was compiled with the help of local officials. Respondents were then randomly selected from the list. Identification of the sampled grid on the ground remains a rather rough exercise, carried out with the use of landmarks identified on the map.

In Eastern Nigeria we used a similar two-stage approach, except that we took villages instead of grid squares. Lists of villages were available from census, tax and voting records. The interviewer made a map of the selected villages, indicating the place of each compound and making a list of all household heads in each compound. This list then provided the sampling frame.

Niels G. Röling, Agricultural University, Wageningen
(Kenya, Nigeria)

CONSTRAINTS OF FEASIBILITY IN VILLAGE SELECTION

In our research in Northern Nigeria we have found that sub-criteria of a practical nature often must be taken into account in the final selection of the villages. For example:

1. Some assurance may be necessary that the villages will be cooperative throughout the study and that

1. village leaders (i.e., village heads) are sympathetic with the objectives of the research.
2. Villages devoid of steep slopes will permit aerial photography to be used without having to correct field measurements for distortion due to field slopes. (In fact this is usually not a serious problem.)
3. If limited time is available for constructing farm maps, it may be appropriate to exclude villages or sections of villages that include more than 1,000 inhabitants.
4. To ensure adequate supervision of the enumerators even the most isolated village must be accessible, at least by bicycle, during the rainy season.

Practical criteria of this kind will differ from one country or region to another, and will depend on sound knowledge of the economy and culture. The subjective judgment the researcher applies with regard to the representativeness of the villages and the criteria used in selecting them probably do not in most cases introduce serious biases. However, in a field situation the research worker can never be free from concern about the conflict between what is statistically feasible and what is feasible practically bearing in mind the availability of only limited financial and manpower resources.

David Norman, Ahmadu Bello University (Nigeria)

PURPOSIVE SELECTION OF VILLAGES

In a study concerned with the impact of population pressure on agricultural production and management, we concluded that we needed to select three villages with differing man/land ratios (each being representative of others in the same general location). However, to ensure uniformity in other respects, we tried to make sure all three villages had:

- a. homogeneity of market opportunity;
- b. similar soils and climate;
- c. a common tribal background;

and for administrative purposes we looked for villages that were:

- a. within half a day's drive of a central point (where the supervisor would reside);
- b. accessible by 4-wheel drive vehicles throughout the year.

Published data and the local knowledge of institute, ministry, and university personnel made it possible to identify at least three suitable project villages within a week of field work.

In multi-disciplinary studies it is important that all the cooperating researchers visit potentially suitable villages during this first stage of sampling, to ensure that the proposed villages meet the selection criteria from each researcher's own disciplinary viewpoint.

John Flinn, IITA (Nigeria)

One example of purposive selection of villages can be cited from a study in which we sought to make sure that our sample of farms represented varying degrees of accessibility from an urban area. This was done in cognizance of Schultz's locational matrix hypothesis, which suggests that farmers' incomes will tend to be higher nearer urban areas than those located further away owing to greater efficiency of the factor and product markets. The adoption of this criterion usually meant that villages were located in areas of different population density, since population density is often higher close to urban areas. This has a marked impact on the farming system adopted, and theoretically on the availability of nonfarm employment opportunities.

To permit an intensive study, only two or three villages were selected in each of the five areas. As far as possible, villages were selected that would be representative of other villages in the same general location. This was simply a subjective judgment, but there seemed to be little use in employing an objective sampling procedure since in

any case the number of villages it was feasible to work in was too small to satisfy any statistical sampling criterion. Little could be done to ensure that the villages were representative apart from taking considerable care and time in selecting them. Significant differences in natural resource endowments are obvious. This and the relative degree of emphasis on nonfarm employment may, in fact, be the most relevant criteria in assessing the representativeness of the selected villages.

David Norman, Ahmadu Bello University (Nigeria)

In our study in Kwara State, fourteen villages were selected from eleven administrative districts. No formal statistical method was used. Selections were made in consultation with the extension officers, who have a good working knowledge of the agricultural activities and the infrastructural facilities of the area. Production patterns and the range of crops produced in the division were the selection criteria, and one to three villages considered representative were selected in each division.

Relying on the judgment of extension workers may raise a question as to how truly representative those choices will be. The question of representativeness is often less serious than it appears at first sight to be. First, there tends to be a uniform degree of capitalization in traditional farming. Second, labor still represents the dominant input and the stage of adoption of agricultural innovations is often fairly uniform. If these are the circumstances in the area being studied, the possibility of extensive variation in resource endowment and enterprise combination is much reduced.

O. Ogunfowora, University of Ibadan (Nigeria)

Using Two Sampling Methods in a Single Study

At times it might be necessary to carry out different sampling methods in one study, especially if it involves two or more study areas or groups of people. For example, whereas dwelling units (houses) in the Frafra homeland could be used for the sample frame, individual households

were used for migrants in the south. This was so because in the south migrants stay in houses with other migrants from different areas of origin.

Two different interview schedules were used, one for the migrants already at the receiving areas and the second for people residing in the homeland or area of origin.

Stratified sampling and systematic random sampling methods were found to be very appropriate in the south, while only systematic sampling was used in the Frafra homeland.

John S. Nabila, University of Ghana

Baseline Survey Designates Units for Sampling

We have used a baseline survey to provide a complete enumeration of the village to develop a sampling frame and to verify whether the village meets our required first-stage selection criteria. The baseline survey normally consists of 8 to 10 questions and takes about 10 minutes to complete per household. Households are excluded from the sampling frame if they do not meet preconditions (e.g., the farmer may be absent from the village for extended periods, have a full time job). The remaining farmers provide the sampling frame from which a random sample can be chosen.

John Flinn, IITA (Nigeria)

Building and Verifying the Sampling Frame

We have found it necessary to do a listing before selecting sample units, because this allows for stratification of the sample. No adequate alternative sampling frame exists in Sierra Leone. Chiefdom tax lists have been used by some researchers in other parts of Africa. In Sierra Leone we have found them unsuitable since they do not contain information on occupations of households and contain many inaccuracies. In an attempt to use them in a pilot study of farmers' credit operations in Sierra Leone, a colleague discovered that many farmers and some villages

did not even appear on the tax lists, and selected farmers could not be located.

In preparing a primary sampling frame for a survey of small scale industries in urban localities, all selected localities were visited by a team of enumerators, who walked down every street identifying and visiting every small scale establishment to find out the business organization, type of small scale industry, number of people employed, etc. This list made possible a stratified random sample of the types of establishments and the technologies represented. (The number selected was determined by a previous decision to station one enumerator in small and two enumerators in large localities.)

Dunstan S. C. Spencer, University of Sierra Leone

Ingenuity Can Sometimes Make Faulty Lists Usable

Some thought can improve a frame already available, with little effort on the part of the investigator. For example, although each cooperative society has its list of registered members in North-West Tanzania, these are rarely updated. However, each society does have cards for each farmer delivering produce to the society last season, which provides a useful basis for updating the registered lists.

Michael Collinson, Commonwealth Development Corp. (East Africa)

LOCAL KNOWLEDGE MUST BE ACQUIRED

The choice of a sample is a difficult task in countries like Tunisia. When the population is not known, sampling should be preceded by an information-gathering stage at the local level. Here, as in other LDCs, little information is readily available on the universe being studied.

The local political administrator, the Cheikh, has proved to be a valuable source of information on which sampling for farm surveys can be based. Operationally one can list the key characteristics of the population he wants to study. On the basis of such characteristics, the Cheikh and his

aides can identify the population quite accurately.

This was the procedure used in our survey of wheat technology adoption in Tunisia, and we obtained a sample of farms with a size distribution much closer to that reported in the Census of Agriculture than the National Institute of Statistics was able to generate with more complicated and more sophisticated techniques such as aerial photography and Cartes d'Etat Major.

The geographical entity under each Cheikh's control has also shown some positive advantages as a basic unit for sampling. In the case of Tunisia probably only the family surpasses the Cheikhat in homogeneity, particularly with respect to agricultural characteristics.

Salem Gafsi, IBRD (Tunisia)

PRECISE DEFINITIONS SAVE LATER CONFUSION

The list of households in each village was prepared before sample selection, and the definition used for households in the survey was "one person or a group of persons, with or without a family relationship, who live in the same house or in the same part of a house, who share their meals, earnings, and expenditures, and who take part in the management of the household and who render services to it."

The following points were taken into consideration in the course of preparation of the household lists:

1. Households that are physically located in the village continuously are considered resident of the village regardless of how brief a time they have been located there, and are included in the household list.
2. Households that own or operate land within the boundaries of the village but are not physically resident there are not included in the household list.
3. Households included in the list need not be involved in agriculture. For example the households of teachers and shop-owners who live in the village but do not own land are included.

4. Households located in the village only temporarily are excluded.

Omer Gucelioglu, State Institute of Statistics (Turkey)

Numbering of Housing Units Aids Sampling

In each village involved in our basic farm management studies, one step involved in deriving a sampling frame was to paint numbers on every compound in the village for identification purposes and to avoid possible confusion over people with similar names. Surprisingly, no villagers objected to this. In fact, it became a type of status symbol and complaints arose when a compound was mistakenly left unnumbered. Enumerators soon learned to identify individuals with particular compound numbers. A compound was defined as a single physical housing unit. In Muslim Hausa areas, for example, this usually consists of a number of huts surrounded by a wall and an entrance hut.

David Norman, Ahmadu Bello University (Nigeria)

REPLACEMENT WITHIN THE ORIGINAL SAMPLE

In choosing a sample we have found it useful to select an adequate number of replacement units which can be used if it is impossible to work with some of the original sample units.

The main reason for replacement in a farm level study is the movement or death of sample farmers. A minor reason was the expressed wish of selected respondents not to participate in the study. Our experience has shown that such reluctant respondents usually will cause a lot of non-response later in the study if forced into the sample, so we prefer to drop them at the start. We have provided our enumerators with a 25 percent replacement sample, but none have had to make that many replacements.

For the small-scale industry study there were a few cases where it was necessary to make more than 25 percent replacements. This was because of the additional problem of itinerant operators, especially tailors and carpenters,

who moved their place of business during the three-month interval between the listing exercise and the start of the detailed study.

Dunstan S. C. Spencer, University of Sierra Leone

We should not forget that it is sometimes very difficult for the research worker to end up with the same number of farmers he started with. In some cases, we could not find the farmers in their villages even after making several appointments to interview them at their convenience. In other instances, farmers who were at first very easy to find later became, for one reason or another, very difficult to find.

To overcome such problems, we usually take two precautions. We interview a larger number of farmers than is determined in the sample, and later take the exact number we want. It may be argued that this procedure involves an element of waste, but we have usually made some use of this additional number either to replace farmers who drop out before the study is completed or to substitute for some for whom the data collected are not complete.

We keep a list of substitutes within the same village to replace dropouts. If after a reasonable number of visits we can not trace a farmer, we avoid waste of time and delay by substituting another for him. In some studies we were forced to replace a number of respondents because they turned out to be engaged in some other business than farming.

A. M. El Hadari, University of Khartoum (Sudan)

IV. LOCAL SUPPORT AND COOPERATION

AREA PREPARATION: A VITAL EXERCISE

Area preparation is essentially a public relations exercise within the survey area.

In carrying out local surveys it has always seemed of the first importance to clear work in the area with officials of all ministries which might be affected and with traditional authorities. Agreement on the need for the work should be reached with higher level officials of the administrative unit covering the whole survey area, and a letter to the more local officials of the various implicated departments forms the basis of an introduction.

The next vital step is to convince local governmental officials or traditional authorities of the need for cooperation. Failure to do so must lead to an ineffective survey. Support of local leaders is essential to eliciting meaningful answers from survey respondents. Any hint from leaders against the survey will sour the relationships between the team and local people. Support is particularly vital in limited-visit surveys where enumerators have no time to build rapport with participating farmers.

It is useful to use an institution with which the local people freely identify themselves, and which reaches down to farmer level, as a vehicle for area preparation and if possible for sampling procedure. In North-West Tanzania surveys were implemented through the strong cooperative movement. Before moving into an area discussions were held with the tertiary level Cooperative Federation, which sent a representative to introduce the survey

team to the Cooperative Union, a secondary level organization supervising the activities of the cooperative societies throughout the survey area. With the union committee convinced, primary societies were selected as first stage sampling units and a union official introduced the survey team to meetings of each society's committees. With the primary society committee convinced, registered lists were updated and a general meeting of society members arranged. After a discussion sometimes farmers would be selected as final sample units in the general meetings or a preselected list would be put to the meeting.

The major problem at public meetings is a peg, recognizable to the ordinary farmer as a benefit, to hang the survey on. Where the survey can be genuinely tied to the future availability of a credit scheme or improved seed, these types of incentive are helpful. One negative incentive may stimulate support: stressing that the survey would bring out the real problems of local farming as a focus for making extension efforts more relevant.

In practicing a policy of keeping local farmers fully in the picture, the selection of farmers or sample units at village or cooperative society meetings has had very good results. Active participation of society or village officials in the random selection procedure, with local farmers present, creates an obligation to the community for cooperation on the part of selected farmers. Indeed, at some meetings there were objections that individuals selected were unworthy to represent the community, a situation that requires careful talking to resolve.

Michael Collins, Commonwealth Development Corp.
(East Africa)

Letters of Introduction Smooth the Way

Long before enumeration began, letters informing them of the research were sent to all Regional Education Officers by an official of the central headquarters of the Ministry of National Education. All Regional Education Officers gave their full support and assistance, writing letters to

District Education Officers concerned and to the headmasters of all the schools being sampled.

Hence even before the enumerators arrived, the schools had been contacted about the nature of the research and had been encouraged to provide whatever assistance was necessary.

The headmasters in all cases were extremely helpful, introducing the enumerators to the staff of the school and often escorting the enumerator to ten-cell leaders in the area.

Each enumerator also had a copy of a letter written by the University administration informing whoever was concerned of the nature of the research work. This letter was most useful in meeting with local government officials attached to institutions other than the Ministry of National Education.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

Aid in National Planning Stressed

The State Institute of Statistics expended considerable effort on publicity for the survey. The general message was that the study was necessary to assist in government planning and programming; hence, members of household were requested and urged to give full and correct answers to the questionnaire.

Omer Gucelioglu, State Institute of Statistics (Turkey)

WINNING COOPERATION TAKES TIME AND PATIENCE

To secure village cooperation, a lot of time was spent conferring with divisional agricultural officers who then explained the objectives of the study to the chiefs and other important personalities in the villages. The project was also given wide publicity over the radio.

Random sampling was done in the presence of the chiefs and the villagers, in order to convince them of the impartiality of the selection procedure. If the village head and

some influential members of the village were not drawn in the original sample, they would ostensibly be included during the selection and data-gathering exercises, although to keep the truly random nature of the sample the data obtained from such farmers were not analyzed.

Once the village head and the influential members of the village were favorably disposed to the project, it was not difficult to obtain the enthusiasm and cooperation of the other sample farmers.

O. Ogunfowora, University of Ibadan (Nigeria)

Drawing Sample Is Made a Village Project

We have used with good results the technique of selecting participating farmers during a meeting with the villagers, with a senior member of the community drawing the required number of names out of a box containing the names of all farmers in the sample frame.

As each farmer's name is drawn he is given the opportunity of not participating in the survey, the ballot continuing until the required sample size has been obtained.

Prior to this meeting the village chief or one of the councillors has been invited to participate in the survey, both to keep them informed at all stages of the information being sought and to demonstrate to the villagers that the survey has the continuing approval of the community leaders.

John Flinn, IITA (Nigeria)

Association with Village Leaders Promotes Confidence

To gain the confidence of villagers we stay with them, if possible, in their villages, eat with them, attend their social gatherings and the like. But one point of special importance is that we try from the very beginning to associate ourselves with the "big" men in the village. These may include the "sheikh" (most religious man in the village), the "omda" (chief of the tribe), and merchants. When farmers see you with such prominent village figures they are

somewhat reassured of your intentions. If you do not have the “green light” from such people, suspicion can easily be aroused against you. These village leaders know all the other villagers, and their homes and shops are village gathering places. Finally, they can help to locate farmers and to check the accuracy of information provided.

In one study in the Northern province I was interviewing a farmer about his wheat production. Later I found occasion to ask the omda about that particular farmer and was surprised to learn that he had not grown any wheat that season. Next day I checked back with the farmer, who confessed that it was true that he had grown no wheat that season; his answers dealt with what he had done previous seasons and what his neighbor did in that season.

A. M. El Hadari, University of Khartoum (Sudan)

Maintaining Acceptability Throughout the Community

Once the initial contact has been made in an area and an enumerator was assigned responsibility for a particular community, it was up to him to find ways to become genuinely a part of that community. This is a 24-hour job, and may involve “work participation” in the field, in workshops, or in the classroom. Enumerators or research workers who could not shed their city ways and dirty their hands and feet proved of little use.

Enumerators must be particularly conscious that there are likely to be groups and divisions within the community which an outsider may not notice. Whenever possible and logical, they need to deliberately associate with members of all groups. Experience has shown that highly-educated enumerators often gravitate toward the better educated and wealthier segment of the local community. This may affect the sampling procedure and almost certainly will influence the nature of responses from other segments. An obvious precaution is for enumerators deliberately to seek associations with members of all groups. (This is, of course, not always possible. For example, a male enumerator will find association with different categories of women circumscribed; he must learn and follow the

local definition of appropriate social conduct or the whole research will be jeopardized.)

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

VOLUNTARY NATURE OF PARTICIPATION EMPHASIZED

The initial problem was to establish contact with the villagers and obtain and then maintain the cooperation of the farmers throughout the survey year (i.e., April to March). To encourage cooperation, the following approaches were made:

1. The support of the Provincial Agricultural Office and particularly the Local Authority was enlisted before contacting any villages. With this in mind, visits were paid to the traditional ruler in the area (e.g., Emir, Sultan, etc.), and the District Heads, who provided representatives to explain the project to all of the villagers.
2. Considerable time was spent in convincing village heads of the value of the studies. To convey an element of prestige, it was emphasized that their villages had been specially selected. (They were free to refuse permission for the studies to be undertaken in the village, but this in fact was something that never occurred.)
3. Once permission was granted, the village heads held meetings for interested villagers and study objectives were again explained.
4. Village heads were always included in samples of families drawn and were kept informed of the progress of the studies at every stage. In some areas, the village heads helped select the master sample by drawing names of family heads at random out of a tin. Each name was read aloud to by-standers as it was drawn. Having the village heads pick the sample of families allayed any possible criticism of the researcher by the villagers.

5. Each family selected in the master sample was given the opportunity at the beginning of the study to refuse being interviewed, but once the regular interviewing started every effort was made to ensure continued cooperation. (Overall dropout rate has never exceeded 5 percent.)
6. Efforts were made to quickly settle any misunderstandings that arose. If complaints arose concerning an enumerator, action was taken after seeking guidance from the village head.
7. The research worker visited each village at least once a week to assure the villagers of his continued interest in the studies. On each visit an effort was usually made to greet the village head.

In terms of conduct, enumerators were warned to keep on good terms with the villagers and told that in any personal dispute arising the research worker would accept the advice of the Village Head as to whether the enumerator should be replaced or stay in the village. In fact very few problems have arisen in this regard. Presumably this has been helped by the careful selection process used and the fact that the research worker personally visited every week and was able to smooth out problems before they became too serious. Problems that did arise once or twice, and which were treated very seriously, were enumerators borrowing money from villagers and being absent from the village without permission.

David Norman, Ahmadu Bello University (Nigeria)

Villagers Respond to Openness and Frankness

Once the survey villagers have been tentatively identified, the village chiefs, elders and councillors are approached, the objectives of IITA told, the nature of the survey and its tentative benefits to the villagers explained, and their cooperation sought to have the village included.

The researchers return the next day to establish whether the villagers are willing to cooperate. (On no occasion has any village refused to cooperate in our surveys.)

At this stage, the reasons why the villagers' cooperation would contribute to the Institute's research program and so eventually help the farmers themselves are discussed. Assurance is given that the Institute is not a government organization, that any information provided by the individual villagers will be kept confidential and not made available to taxation authorities or government agencies, and that results of the survey will be published as averages of groups of farmers.

John Flinn, IITA (Nigeria)

PARTICIPATION MAKES STUDY MORE CULTURE-SENSITIVE

A research procedure that promotes sensitivity to the local culture by means of community participation has much to recommend it. In Kenya, our first step was to discuss the research idea with the people of the community to learn their problems and their needs. Then, school teachers and field workers from the community were recruited to participate in the preparation of the research design and procedures. These local workers, who know the language and the cultural pattern of the community, became the interviewers and visited families and farms familiar to them.

A questionnaire was first designed by the principal researcher. The interviewers were then asked to develop a corresponding conceptual translation into the vernacular for each question. Literary translation was avoided to ensure that the questions made sense in the local language. Translation of the questionnaire was performed by the interviewers as a team. This exercise provided an opportunity to talk about the objectives, structure, and procedures of the various stages of the research project.

Often interviewers were helpful in eliminating questions which were culturally rejected. For example, a direct

question about the number of children in the family was ruled out and field workers devised a culturally acceptable procedure whereby the interviewer asked, "Where is your first child? Is it a boy or a girl? Where is the second child? Is it a boy or a girl?" and so on until he accounted for all the children in the family.

Shawki Barghoutt, Arid Lands Agr. Development Program
(East Africa, Jordan)

OFFICIAL BACKING: A HELP AND A HINDRANCE

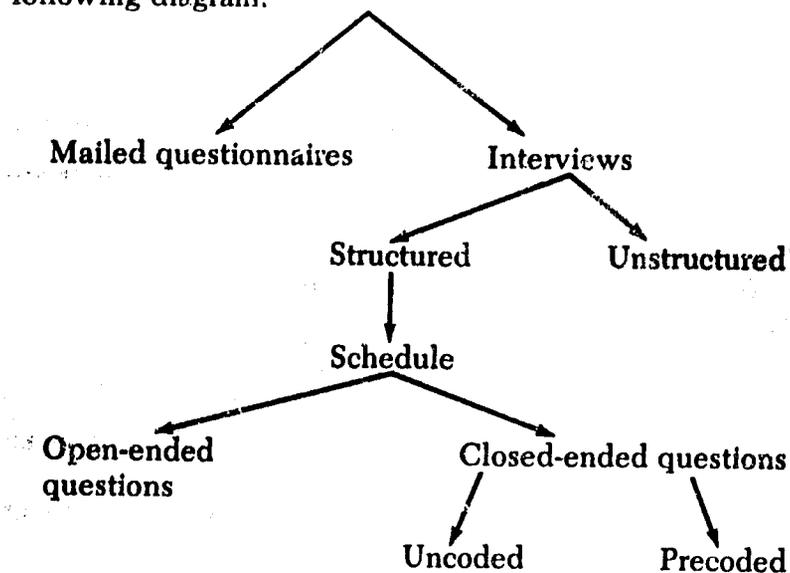
In my experience it is essential that the field workers have an acceptable affiliation and that their presence be legitimated by officials and community leaders. Without that they may end up in jail or at best not obtain any co-operation from the respondents. Awareness of this problem may, however, produce another problem: that the respondents may see the research as a first sign of serious official concern about their problems. This may lead to biased answers and to the creation of expectations which are not fulfilled later on. It is essential to be completely honest about one's purposes and powers.

Niels G. Röling, Agricultural University, Wageningen
(Kenya, Nigeria)

V. DEVELOPING AND USING DATA COLLECTION INSTRUMENTS

ALTERNATIVES IN DATA COLLECTION INSTRUMENTS

The decision points for a research worker developing his data collection instruments are generally indicated in the following diagram:



The *mailed questionnaire* is made up of questions or items to which responses are filled in by the respondent/subject himself. It is self administered. The mailed questionnaire is most useful where there are high literacy rates, where the respondents have a good understanding of the issues in the questionnaire, and where there is a well

developed infrastructure and an efficient mailing system. Some of the disadvantages in using this instrument include:

1. Returns are usually low.
2. Of those returned, there is usually a high incidence of missing data.
3. Researchers lose control of the research instrument and there is no way of knowing exactly how the form was filled. Reliability tends to suffer more with the questionnaire than with the interview schedule. People often do not want to spend much time on something which has been sent to them through the mail. There is no direct *asking* for the information.
4. Unless vivid instructions are included on the questionnaire, coupled with a good public relations job, the intentions of the project might be misunderstood resulting in serious problems. Although this can also happen in the interview situation, the face-to-face atmosphere aids in removing such field bottlenecks.

The *interview schedule* has questions or items which are asked and filled in by the interviewer, usually in a face-to-face situation.

When using any interview schedule, some general rules are to:

- a. Get a good understanding of the area and people you are studying.
- b. Try to explain your role to the people and make sure that it is perceived as a positive one.
- c. Make sure that the *same* introductory remarks about the project are used by all interviewers and supervisors. It is advisable to include information on (1) who you are, (2) what you want, and (3) what will be done with the information.
- d. Where possible, use pre-survey or reconnaissance survey techniques to establish all the necessary contacts.
- e. Make your identity as clear as possible. For ex-

- ample, use the name of your institution on the vehicle; use institutional or departmental stationery (with permanent address on them) for the schedules.
- f. Avoid long interviews. Too much data can be a bottleneck during the analysis stage. Too many questions add to interviewee fatigue and will affect the reliability of the entire schedule.
 - g. Have a uniform, mutually agreed upon translation of all questions or items into the language of the respondents. Vivid translations or instructions can be embodied in a manual.
 - h. Provide a detailed manual of interview instructions, flexible enough to be adjusted to suit conditions in the field.
 - i. Always make sure that the schedule can be read and understood by your enumerators; they matter very much in the interpretation of the basic issues in the instrument.
 - j. Make room for the interviewers to provide remarks at the end of the schedules. These can be very useful notes depending on how interviewers are trained to record what they observe.
 - k. Use the nature of the problem and the study area to determine whether to carry out group or individual interviews. Some questions are better answered in a group than by individuals, and vice-versa.

A well-thought-out interview schedule gives the research worker control over the interview situation. It helps a good interviewer to explain the meanings of doubtful questions and to seek in-depth responses on some important questions. With a well trained team of interviewers, some measure of standardization can easily be maintained.

An interview schedule usually elicits a higher rate of response than a mailed questionnaire, and makes possible cross-checking or follow-up interviews for missing or incomplete data.

Often there are advantages if interview schedules can be filled in duplicate form. This is usually true if the filled

schedules run some risk of being lost or if the interviewer needs copies of schedules already filled to give him a total picture of work carried out. If schedules are duplicated, and if follow-up checks are carried out by the supervisor, interviewers tend to be more careful. One obvious disadvantage is that the carbon paper, especially if the interviewing involves travelling, can produce confusing marks on filled or unfilled schedules.

Some possible disadvantages of the interview schedule include the fact that it may be difficult to obtain very sensitive information in a face-to-face situation. (Interviewer can try to avoid *direct* eye contact when extracting sensitive data; it is embarrassing to ask intimate questions while looking into the respondent's eyes.)

The mere presence of the interviewer can modify the behavior and/or the responses of a respondent. Language problems (translations) can also create serious gaps in data collection.

For both questionnaires and interview schedules, short instruments are better than long ones. One page instruments help the researcher to focus on major issues and save time, cost and paper. The data collected should be geared towards the types of analyses the researcher has in mind.

The layout of the questionnaire/schedule should be in a logical sequence, usually from the general to the specific. Sensitive information, if it cannot be calculated or obtained without a face-to-face situation, should be left out of research instruments unless it is vital information. If sensitive data *must* be obtained it may be sought at the end of the interview or at the end of the questionnaire. However, if the sensitive question/item is located in the logical sequence of questions it will appear less sensitive. The researcher should recognize that sometimes his interviewers will be more uncomfortable than their respondents in dealing with sensitive subjects; interviewer training and supervision should take into account this possible problem.

Structured and *unstructured* interviews are differentiated on the basis of the type of stimulus used by the

interviewer. A structured interview is one in which a similar stimulus is given to all respondents; unstructured interviews tend to result in different stimuli being given to different respondents.

Unstructured interviews are good for pre-surveys or preliminary explorations. They are good for the "participant observation" method of data collection and for studies seeking descriptive type of information (where no statistical testing is necessary), e.g., village facilities, historical incidents, etc.

The disadvantages of the unstructured interview include the need to have high calibre enumerators, the possibility of omission of necessary information on certain variables from some but not all respondents, and the possible bias resulting on similar variables from different respondents.

Structured interviews utilize schedules whose questions can be:

Open-ended—where the respondents give their own answers.

Closed-ended—where the respondents choose among limited number of responses.

Open-ended questions are useful when there is little knowledge of the area, when certain types of "qualitative" information are being collected, and when it is necessary to undertake study across diverse areas (e.g., ecological, ethnic etc.). A lack of time to derive adequate closed-ended questions through pre-survey techniques, and cost in terms of paper to provide lengthy lists covering all areas, encourage open-ended schedules.

When ordinal, interval or ratio data (quantitative data) are gathered, it is better to use closed questions/items. Nominal data (qualitative or subjective information) are less amenable to closed items. Often a combination of closed items and more probing open-ended questions is needed.

Open-ended questions can be used during the pre-testing of the instrument and then developed into closed questions, especially if there is a common trend in the responses. Disadvantages of open-ended questions are that

they are difficult and time-consuming to process (which will involve the research worker himself or very high calibre staff), they may be difficult to analyze, and consequently it may be difficult or impossible to manage them with large samples. Closed questions aid pre-coding.

Taking all these points into account, closed-ended questions should probably be encouraged whenever possible. Both open and closed-ended questions appear on most schedules, and the proportion of the latter will depend to some extent on the type of study involved. It was agreed that the necessity for an open schedule can be considerably reduced by a good pre-survey, which enables closed-ended questions to be drawn up. Exploratory or pre-surveys are often not emphasized sufficiently and must be done by the research worker himself.

It is desirable, whenever possible, to use closed-ended questions in an open-ended manner (i.e. don't suggest the answer to the respondent, but fit his reply into one of the categories listed on the schedule).

"Coding" refers to converting questionnaire or schedule responses into data in a form for quantitative analysis. This can be in two stages:

1. Pre-coding during the interviewing stage.
2. General coding after the data are collected.

Simplistically, a pre-coded schedule can be defined as one on which enumerators during interviewing enter the actual codes which are later to be punched directly on to cards.

Pre-coding saves time. If coding is suitable for sorters, many data items can be compiled on one computer card. Pre-coding reduces the chance of field error and facilitates easy and comprehensive supervision/cross checking in the field.

Pre-coding also has some disadvantages. Unless closely supervised, interviewers are more likely to make mistakes than when they only fill in answers. Higher calibre staff are

required at the data collection stage than would be necessary with uncoded schedules. The potential for errors (and cheating) in the data collection stage is usually higher compared with uncoded schedules. The number of punched cards resulting from a precoded schedule is likely to be higher than from later processing of uncoded schedules, in which case costs will be higher. Finally, with precoded schedules it is necessary to be very certain as to what type of analysis will be required.

Rigidity in precoding is a frequent problem; responses are not as expected, and the coding may leave no scope for additional categories. This is particularly likely to occur in exploratory research, where the parameters of the problem under investigation are largely unknown. To aid precoding reliability, both pre-codes and actual responses should appear on the instrument. Every questionnaire or schedule should have an identification number. If it becomes apparent in the field that responses do not fit given pre-codes, this must be settled later with the researcher and all interviewers.

Pre-coding must not be done as a fetish. Avoid pre-coding the various obvious quantitative data; for example, why pre-code age categories when actual ages can be key-punched?

Great care must be taken to create conceptual categories that are clearly understood by the coders and fit the phenomena being coded. Inter-judge reliability is especially important when coding open-ended, qualitative data. When coding is done at the end of the data collection stage, some or all the coders should have taken part in the data gathering itself. Or coding supervisors should be people who took part in the data gathering.

One other point emphasized was that the data from many questions in schedules are never analyzed. A flow chart indicating the types of data required can help in eliminating superfluous questions.

(From the Beirut seminar working group reports)

Limitations on Mailed Questionnaires

Mailed questionnaires can only be used in communities with high literacy and good records of residential areas and mailing addresses. In East Africa, this limits their use to cities and to such groups as university and school students, government workers, and professional people.

Mailed questionnaires assume that the respondents know how to read and write, and do not need "supervision" in getting their answers down on paper. The respondents must be "responsible," and willing not only to answer the questions but also to mail the completed schedule back. They are expected to understand the instructions given. At the same time, it is assumed that they are busy and difficult to find for a personal interview; the mailed questionnaire is intended to let them answer at their convenience. They are men and women with fixed addresses of contact, and they live in areas with good postal facilities. Very few rural areas satisfy many of these requirements.

T. B. Kabwegyire, University of Nairobi (East Africa)

Illiteracy of respondents and lack of records have usually precluded our use of the mailed questionnaire. Returns tend to be quite low, in fact, even when mailed questionnaires are used to solicit information from respondents known to be literate. In a recent attempt in Sierra Leone by a foreign consulting firm, only 29 out of 216 questionnaires mailed out were returned.

Dunstan S. C. Spencer, University of Sierra Leone

POSSIBILITIES AND LIMITATIONS OF RECALL

In an illiterate population, on attributes for which collection is by interview, *all* techniques are memory-dependent, whether memory must reach back only to "yesterday" for daily visits or over the season for single visits. Memory performance may be, but is not necessarily, related to time elapsed since the event occurred (the reference period).

These points are often overlooked in the comparison of frequent and limited-visit surveys. Interviewing can give equally as accurate data as measurement, particularly when the reference period is correctly related to the incidence of the events. The evidence points to *frequency* and *regularity* and *significance of events to the respondent* as key factors in memory performance. Events which are frequent and regular build up a pattern familiar to the respondent, which can be drawn upon in answer to questions about such events. Infrequent and irregular events, particularly if relatively insignificant to the respondent, pose the real problem in data collection.

What is clear with the patterns created by frequent and regular events is that the respondent may be answering *out of experience rather than from memory of one specific incidence of the event*. This may be equally true whether he is questioned on events of a week ago or a year ago; it depends on the characteristics of the event.

I feel a case can be made for exploiting experience rather than direct recall of specific incidents where it cuts the cost of data collection. Labor input data is a key attribute in peasant farming, and is regarded as the most expensive data to collect. Evidence from work among tobacco farmers in Western Tanzania is that it can be obtained by tapping experience rather than recalling specific incidents. Exploitation of the possibility of using experience as a basis for response, rather than direct recall, is an important area in the design of lower cost farm management surveys.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

FACTORS THAT INFLUENCE RECALL

In many developing areas, and northern Nigeria is no exception, nearly all farmers are illiterate and consequently no records on farming transactions are kept. Therefore memory recall is critical in collecting data. Lipton and Moore have drawn a useful distinction between *single point* and *continuous* data and between *registered* and *nonregistered* data. The continuum ranglag

from single point to continuous data refers to the length of time taken to complete an activity. The continuum ranging from registered to nonregistered refers to the extent to which circumstances influence the respondent's ability to remember the quantities of an activity. Securing reliable data in the *continuous nonregistered* class requires frequent interviewing if measurement errors are to be kept at a reasonable level, since memory recall will not be good.

Unfortunately, while measurement errors can be reduced by more frequent interviewing of relatively small samples, sampling errors are reduced through using large samples. The research worker with fixed resources must invariably face an unpleasant choice between either trying to minimize measurement or sampling errors.

When we have tried to reduce measurement errors to a reasonable level, frequent interviewing has been supplemented with direct observations on certain critical variables. Without frequent interviewing we find it almost impossible to obtain reasonable estimates of labor utilization, particularly of family labor, which is a major input in traditional agriculture.

What "frequent interviewing" should mean in the northern Nigeria context was subjectively determined. Ideally one should decide the acceptable degree of measurement error and then determine the minimum frequency of interview and necessary research resources to meet the requirement. This becomes impossible when little is known about the environment and data are being collected on many different variables, as in a farm management study. We collected data at two levels of frequency:

Class 1—Data collected twice weekly (e.g., labor, seed and fertilizer inputs by field, etc.).

Class 2—Data collected infrequently (e.g., farm inventory, retail prices, crop rotation and land tenure patterns, conversion ratios, etc.).

David Norman, Ahmadu Bello University (Nigeria)

Use of Recall in Studies of Adoption

We have had varied experiences with respect to the reliability of recall. However, we depended on respondent recall with very satisfactory results in establishing the dates of adoption of farming practices, a kind of data essential in our construction of "indices of innovativeness." Scores based on the resulting indices proved to be strong variables in terms of discriminatory power and correlation with other variables.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Preferred Frequencies of Interviewing

In farm management surveys we conclude that daily interview intervals involve too much pestering of the farmers, but any interval longer than three days results in overlap or loss of accuracy and is regarded as seriously affecting survey results. Twice-weekly interview intervals have given us the best trade-off even though suffering from being costly and generating results that are slow in forthcoming. One-shot surveys, properly timed at the end of the production cycle when farmers have already assessed in their minds their input-output and profit-loss position, have a definite place in the methodology of data collection and should be—in the light of the magnitude of the general data gap—more widely promoted.

Karl H. Friedrich, FAO (Tanzania and Ethiopia)

Weekly Visits Solve Some Problems

Our enumerators made weekly visits to each farm and recorded all the activities the farmer and his family had performed during the previous week. The method has two distinct advantages: (1) the enumerator cultivates friendships with the farmers by visiting them weekly; and (2) he

records events as they occur and thus does not have to rely on farmers' memories.

Getachew Teclé Medhin and Telahun Makonnen, University of Addis Ababa (Ethiopia)

Length of Recall Differs for Different Variables

Before the start of our rural employment research project, in which labor input was to be measured in man-hours, an attempt was made to test the length of memory recall of daily labor input, cash expenditure, and produce harvested. A small group of farmers was interviewed daily, obtaining information for one to seven days' data recall. Analysis of variance showed that there was no significant difference in the reported sample means between the data for one and seven day recall in the case of two variables ("amount of rice harvested" and "man-hours family labor used per day"), but there was a significant difference for "value of food and drink purchased."

A major flaw in the above experiment was that it did not correct for the learning process associated with repeatedly asking the same respondents the same questions about work on a particular day. A rotating panel is needed to take care of the learning problem. Nonetheless, the experiment showed that even with the learning process, there are some variables whose details a traditional farmer cannot be relied on to recall even for a period as short as one week.

Dunstan S. C. Spencer, University of Sierra Leone

FIT INTERVIEW FREQUENCY TO STUDY'S NEEDS

The vast majority of farmers interviewed in our field surveys are illiterate. None keep written records of their farming activities or financial transactions. Thus multiple visits must be made if the objective of the survey is to record the dynamics of a farming system over time.

Twice-weekly intervals may be needed if the reason for

the survey is to study the management of an integrated farm-family system. Irregular visits will suffice when the objective is to concentrate on specific crops or specific aspects of crop management or production. For example, a cassava production study whose objective is to identify the range of environmental (soil, pest, climatic) and management factors which influence cassava yields can include visits to the sample of farmers at intervals not regularly spaced but corresponding to the time sequence of operations and the major stages of physiological development of the crop (i.e., some six visits spread over 12 to 14 months).

Where experience and the literature suggest problems in the recall of specific details relevant to the study (e.g., labor inputs, incomes and expenditures, consumption), we have made visits twice a week. This visiting frequency is arbitrary, but it seems to be adequate, for example, when measuring labor inputs in half days. There is, of course, a trade-off between frequency of visits versus number of farms that can be visited.

John Flinn, IITA (Nigeria)

PICTORIAL DATA SHEET IS BEING TRIED

Even where we figure on a maximum of four days recall, we still have some doubt about the accuracy and reliability of some kinds of data. Custom processing units, especially rice mills, may handle a large quantity of produce on any one day but in small units. Operators may genuinely have difficulty recalling the number of customers they had, the quantity of rice milled, or the recovery rate (which depends on variety as well as method of preparation). In an attempt to get these illiterate operators to keep some records, one of my colleagues designed a pictorial data sheet which we are asking respondents to use in keeping a record of each transaction. This questionnaire is being tried out now.

Dunstan S. C. Spencer, University of Sierra Leone

STRUCTURE FOLLOWS EXPLORATORY STUDIES

My main investigative tool is almost always a structured interview schedule which is largely closed-ended and almost totally pre-coded. But this tool is the outcome of a lengthy initial period of investigation.

In the *exploratory* first phase of research, the principal activities involve a search for likely strategies (independent variables) to overcome perceived bottlenecks (dependent variables), and a commitment to allow people and events in the study location to contribute in crucial and critical ways to the process of generating useful hypotheses about these strategies and bottlenecks. Data collection during this phase is therefore likely to be very unstructured and open-ended.

In the second *confirmatory* phase, a field experiment can be used to test the feasibility and pay-off of some of the more promising strategies for overcoming bottlenecks to rural development. Structured data collection, therefore, starts only after the exploratory phase is completed.

Joseph Ascroft, University of Iowa (East Africa)

MORE STRUCTURE NEEDED IN SINGLE-VISIT SURVEY

With a limited visit survey, a structured schedule is important for several reasons:

1. To prompt the enumerator to cover all facets of the farm which require investigation;
2. To carry the farmer through a logical sequence of events interconnected in his mind and therefore better remembered in association, at the same time avoiding repetition of subjects the farmer must recall;
3. To avoid unnecessary physical effort in covering ground on the farm particularly any repetition in visits to fields;
4. To allow checks on the consistency of farmers' answers and on the awareness and reliability of enumerators.

The second reason is perhaps the most important for successful implementation of a one-visit survey and, combined with the third, dictates the basic format of the questionnaire. For example, even with a single visit survey the areas of fields may have to be measured by compass and plane table or perhaps by pacing. At the same time it is essential that the farmer be in the field of a particular crop when questioned on labor use for that crop. Thus the questionnaire will need to be organized on a field-by-field basis, not acreages recorded in one part and labor use in another.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

When to Use a Structured Schedule

Use of very complete and detailed schedules, listing all possible answers, can be defended for farm management studies on the following grounds:

1. In such studies, the data collected are repetitive in nature and large in quantity terms.
2. A standardized coding system on the survey form speeds up the processing of the data in the office.
3. A highly structured survey form minimizes the possibility of missing information or ending up with incomplete information. In fact, when our survey form was slightly less structured and enumerators were asked to write in, for example, the job of work done on the field rather than use the pre-coded system, this proved unsatisfactory since they recorded, for example, "weeding" instead of the symbols for first, second or third weedings, as used in previous surveys.

David Norman, Ahmadu Bello University (Nigeria)

Pre-Testing Sharpens the Research Instruments

Pre-testing of the interview schedule or other research instrument should not be confused with the reconnais-

source survey that is also recommended. The reconnaissance survey helps to put the whole research project in the right perspective; pre-testing *sharpens the research instruments*. An instrument may be only in a guide form during this pre-testing stage. It is during this stage that the researcher decides which questions to retain, discard or add to the instrument.

The pretest also helps him decide whether a question/item should be structured/closed (where the respondents are allowed limited number of responses) or unstructured/open-ended (the respondents give their own answers).

Pre-testing can also promote the pre-coding of responses, thereby minimizing coding cost after the data are collected. (Where the researcher envisages the use of multivariate analysis, the pre-coding or the actual coding scheme must be such that higher values can be assigned to the most important responses.)

John S. Nabila, University of Ghana

Making Pre-Testing More Productive

Pre-testing is of special importance in limited-visit surveys. It is important also in frequent visit surveys, but can be based on the initial month's records, revising the questionnaire format and if necessary scrapping the records collected for that first month.

It has always seemed to me important for the survey designer to follow the pre-test interview between farmer and enumerator very closely *whether he follows the language or not*. The attitude of the farmer and the confusion of the interviewer will make clear the points at which problems are occurring.

Translation of the questionnaire is a vital exercise. Pre-survey investigation can document local terms used in measures of land and weights so they can be incorporated into the questionnaire, facilitating the work of the enumerator.

The problem of translation seems to vary with language,

and there appear to be languages in which changes in sentence structure and word meaning are very complex. There is no substitute in such cases for a prolonged session with a local professional man capable of grasping the objective behind each question to ensure that the phrasing conveys the desired meaning.

Michael Collinson, Commonwealth Development Corp.
(East Africa)

Adapting Form of Question to Data Requirement

We use explicit questions seeking single-valued responses whenever we want to collect quantifiable information on labor use on the farm, the use of inputs and crops harvested, disposal of products, and the financial transactions of the household. Open-ended questions are used when the objective is to provoke a discussion with the informant and seek his ideas and perceptions of reality, his attitudes and reasons for pursuing specific management policies, and his perception of the problems he faces.

John Flinn, IITA (Nigeria)

OPEN-ENDED QUESTIONS: MORE DEMANDING, MORE REWARDING

We found open-ended questions advisable initially because of the dearth of information on attitudes of parents and children toward education in East Africa. My objective was to explore the interaction between family and school. Given this objective, open-ended questions seemed the best way to probe the ideas of the respondents.

There are definite disadvantages attached to open-ended questions. Successful use depends completely on the training, finesse and honesty of the enumerator. More is demanded of the respondent as well.

The enumerators were expected to probe each initial response, in order to avoid stereotyped answers that characterize most early ideas and to seek the real meaning of ambiguous replies. Enumerators were also free to rear-

range the order of questions, if it seemed advisable, in following the train of thought of the respondent or when resistance to certain questions emerged. Unless the enumerator probes initial replies, a series of fairly stereotyped answers probably will accumulate. Alternatively, in probing the enumerator may be guiding the answers (e.g., "Is it because you cannot afford school fees that you have not sent your child to school?"). Because of the lack of fixed alternatives, the enumerator is expected to interpret the meaning of replies and paraphrase them in the process of recording. Several possible errors may be committed. For example, the enumerator may develop a "set" of expectations for responses, based on early answers. The enumerator may have "role expectations" based on assumptions of the status of the respondent. This may bias structured and open-ended items alike, but less error is possible in the case of fixed alternatives. This is partly because of the "work" required of the respondent to answer the different types of questions. With fixed items, he may easily grasp the meaning of the question. Open-ended questions may appear to be vague (and too often *are* vague), leaving him confused and silent. If the enumerator is impatient or unskilled, he will have difficulty in handling such a situation. The simplest thing to do is to feed answers to the respondent. Moreover, once an enumerator has interviewed five of six people and found they all share similar replies to certain questions, he is likely to assume lack of variability for the rest of the sample and either will not ask the question at all (filling it in himself from past experience) or bias the question towards the expected answer.

It is also difficult to comprehend the meaning of long-winded and vague responses. Studies of coding bias have shown high variability in possible interpretations of identical replies; the need to paraphrase long replies might be expected to generate similar errors in recording the replies to open-ended questions.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

SHORTER SCHEDULES PRODUCE BETTER RESPONSE

Length of the questionnaire should be of concern to the researcher. A long questionnaire is tedious for the interviewer and a waste of time for the respondent. In my experience the shorter the questionnaire, the better the quality of the response. Even if one plans a half hour questionnaire, it is safe to assume that some respondents will take twice that time to get through the questions. Although I have tried to be always optimistic in my life, I have taken the position of expecting the worst in planning a questionnaire, and assuming that all of the respondents in the sample will have to be guided through it step-by-step.

Salem Gafsi, IBRD (Tunisia)

PRACTICAL REASONS FOR KEEPING SCHEDULES BRIEF

The trick is to keep the data collection instrument in fighting trim by stripping it of whatever fat is not strictly necessary. Data collection is faster, its preparation for compilation and analysis is more manageable, and deadlines can be more easily met. Besides limiting the number of questions asked, it is worth while to physically compress the schedule whenever possible.

First, the slimmer your interview schedule the lower your rate of sample attrition due to refusals; hence, the greater the savings in time, the lower the survey costs, and the more reliable the data you collect. Even illiterates known a fat, time consuming document when they see one. It becomes embarrassing to ask, "May I have a few minutes of your time; I have a few questions to ask you?" when this is patently a lie.

Second, the slimmer your document the more portable it is; therefore the fewer the page-flipping and stapling hassles and the more reliable the accounting, the checking and the coding of the completed instruments by the field supervisor. The issue of portability is to my mind grossly underrated. In Africa, where transportation usually means

travelling long hours in overcrowded buses and accommodation is likely to be dormitory style, toting around heaps of questionnaires is like being attached to a ball and chain.

Third, the slimmer the document the more streamlined and structured it is likely to be. The interviewer finds it easier to follow "skip" and other instructions, he is less likely to omit whole pages of questions, he feels less pressure to "rush" the interview as the subject begins to balk at the bulkiness of the instrument, and data collection is more reliable and complete. Missing data are especially a bane if correlation analysis is envisaged, because there is no satisfactory way of accounting for them.

Fourth, the slimmer your document, the easier it is to make it double as a coding document by incorporating a column-coding strip down the right-hand edge of the page. Therefore, the easier it is to check out inconsistencies during code verification, and the more reliable and error-free the transfer of data from the interview schedule to the punch card. Whenever you can do away with a data-transferral stage, such as from questionnaire to punching matrix, you are doing away with a potential source of non-interviewing error.

Finally, it is so much work compressing every individual question—counting individual letters, measuring words and sentences, typing and retyping and retyping, and then cutting and pasting to fit the smallest possible space—that you find yourself assessing the need for every question in your draft very critically. Unless a question is absolutely essential to the study, you become increasingly inclined to omit it. And this is the best kind of favor you can do yourself—not collecting the data you don't need in the first place, thus not being saddled with having to analyze them because they are there.

Joseph Ascroft, University of Iowa (East Africa)

Proper Pre-Testing Streamlines the Schedule

The instrument should not take longer than about an hour to fill. Pretesting should be very extensive, not only for interviewer training but also to weed out useless questions and to develop answer categories so that one can minimize open-ended questions.

The instrument should also *appear* to be short and be easy to handle. In Kenya, Ascroft introduced the micro typewriter for cutting the stencils and carefully laid out the print to use space as effectively as possible. Matrices allowed collecting much data in little space.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

AMBIGUITY CAUSES PROBLEMS IN ANALYSIS

Questions should be explicit in specifying the type of information requested and the unit of reference. One questionnaire I used included the following table:

Temporary Labor Used In Wheat Production

<u>Period</u>	<u>Number of Workers</u>	<u>Number of Days</u>
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In reviewing the data collected I found startling differences in the number of days reported by farmers with similar characteristics. In checking with the interviewers I came to realize that some had interpreted "number of days" on a per worker basis, others had recorded it as a total, and still others had left it up to the farmer's own discretion. This resulted in the loss of a valuable piece of information, since it was operationally impossible to go back and ask each farmer what unit of reference he had in mind.

Salem Gafsi, IBRD (Tunisia)

Unreasonable Questions Yield Unreasonable Answers

It must always be borne in mind that the farmer, in order to save face, will often give an answer even to questions which are not reasonable. Simply getting an answer to a

question is no indication of its validity. If the research worker ensures that only reasonable questions are asked, he lessens the farmer's temptation to make wild guesses in order to pacify the interviewer.

David Norman, Ahmadu Bello University (Nigeria)

Record Book Stimulates Recall

In studies concerning household expenditures there are two main methods of inquiry:

1. Asking families to enter daily or weekly income and expenditures in a special notebook.
2. Collecting information about income and expenditures by periodic interviews.

Both methods have advantages and disadvantages. The first depends primarily on the family's understanding of budgeting and its cooperation in maintaining a daily or weekly accounting. The main responsibility nevertheless falls upon the interviewer. Because questions on expenditure always cover a period of past time, the problem of faulty recall always exists.

In choosing the collection method to be used in the rural areas in Turkey, we tried to combine the two systems and notebooks were given to the literate member of the household who was asked to write down income and expenditures. In addition, interviewers visited the households weekly to obtain information on income and expenditures. What is the optimum frequency of visits? We visited each household once a week, on the day following the weekly village open-air market. Thus the interviewers were able to visit each household four or five times a month.

Omer Gucelioglu, State Institute of Statistics (Turkey)

Choice of Wording Will Affect Responsiveness

Certain words or phrases may inhibit the respondent's readiness to cooperate. In rural Jordan, for example, questions which started with "What is your opinion about . . ." did not yield specific answers and respondents tried to

outside the issue, while questions which started with "Please tell me about . . ." were found to be effective in soliciting the respondents' candid opinions about the issue.

Shawki Barghouti, Arid Lands Agricultural Development Program (East Africa, Jordan)

WELL-PLANNED PROJECTIVE DEVICES WORK EFFECTIVELY

Our study made effective use of a series of story-like *projective questions*. A story would be told, and respondents asked to choose one from two or three possible "solutions" or "choices." For example, one story is about a father who must choose one of his two children of school-entering age to go to school. Due to financial difficulty he cannot send both. The older is a girl, the other a boy. The respondents choose which one should go (or provide an alternative solution) and explain the reason for their choice.

These questions were exploratory and tentative. In many cases, however, they worked very well. Cross-checking similar stories with questions more directly concerned with the respondent himself indicated that responses were in fact projections of potentially valid solutions within the life space of the individual respondent and his household. Responses were often stated in open reference to self: e.g., "Well, I would like to educate my son because I am sure of his help later on."

This was especially important in the case of the girl respondents, who had great difficulty in answering open-ended questions such as why they were enrolled in school (less difficulty for those explaining why they were not enrolled in school), but also had difficulties in manipulating the ranking questions. When asked to discuss their choices with regards to the stories, however, their replies were meaningful and perceptive.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

SOCIO-PSYCHOLOGICAL CONCEPTS NOT TOO USEFUL

As predictors of innovativeness we found less value than we had expected in such concepts as "empathy," "economic knowledge," "market versus subsistence orientation," "familism," "city orientation," "levels of aspiration," etc. An additional danger, we discovered, is that such constructs tend to create processes where there are none. For example, in "traditional villages" which we had selected precisely because no modern farming was being practiced there we found ourselves asking farmers to identify "opinion leaders in matters of modern farming."

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

ANSWER-SUGGESTIVE QUESTIONS DISTORT REPLIES

Questions should be formulated in such a way that they guide the person interviewed and help him provide the right kind of information. It is too easy to make questions inadvertently answer-suggestive or limiting as far as the scope of the answers is concerned. For example, in studying the adoption of the new wheat technology by Tunisian farmers, we at first put several questions in the following manner:

Question: Why didn't you use High Yielding Varieties on all your wheat acreage in 1972-73?

01. Expensive seeds
02. Trial stage
03. Low germination rate
04. Low competition with weeds
05. Low disease resistance
06. Low yield
07. Low selling price
08. Lower quality
09. High input requirements
10. Other

This kind of long list of possible answers would work if it were practically exhaustive and if the farmer were indifferent as to the answer-suggestive power of the order in which the possible answers were presented. This, however, is usually not the case. The result is distorted information, either because we did not give the farmer the opportunity to provide his own answer or because we did not think of all possible answers or both. We therefore try to avoid this way of putting questions whenever more than two alternative answers are possible. This becomes even more important when one lacks first hand knowledge about the environment in which the study takes place.

Salem Gafsi, IBRD (Tunisia)

Multiple Choice Questions Not Easily Understood

Among illiterate farmers in Jordan, multiple choice questions or semantic differential scales were not adequate for assessing the respondent's knowledge or opinion. Instead, open-ended questions were found to yield more data and to increase the respondent's cooperation with the research team.

Shawki Barghouti, Arid Lands Agricultural Development Program (East Africa, Jordan)

Valid Alternatives Help the Inexperienced Respondent

Open-ended questions are often *conceptually* difficult, especially for young uneducated respondents. Girls had no difficulty in answering a questions such as "How do your brothers help at home?" But they could not easily handle, "Can you think of any reasons why boys go to school?" If they had been given valid alternatives to choose from, presumably they could have understood the meaning of the question more easily and answered more satisfactorily.

With respect to ranking questions, our respondents had difficulty making four rank orders. Two would have been sufficient for my own purposes. Forcing the respondent to "stretch" his own inclination only increases his fatigue

anyway, and negatively affects the relationship with the enumerator.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

USE LOCAL LANGUAGE IN DESIGNING SCHEDULE

In an area where there is a developed written language, efforts should be made to use it for designing the research instrument. For example, we use Twi, Ewe or Dagbani for structuring questions, especially if the research is in typical rural areas. For one thing, it eliminates the biases or wrong translations which can be introduced during the interviewing stage by the researcher or his assistants.

John S. Nabila, University of Ghana

LOCAL LANGUAGE REDUCES INTERVIEWEE SUSPICION

Questionnaires should be written in the respondents' language. The use of interpreters may produce unreliable data due to distortion in on-the-spot translations of the question or the answer or both. In addition, a questionnaire written in a language the respondent can not understand may create suspicion and reduce his willingness to talk freely and candidly about the issues being studied.

Shawki Barghouti, Arid Lands Agricultural Development Program (East Africa, Jordan)

TRANSLATION CARRIES RISK OF AMBIGUITY

The organizer must make sure that his words mean to others exactly what they mean to him. This becomes particularly important when questions are written in one language and asked in another.

In our Tunisian farm practice adoption study I found myself forced to drop a good share of the answers in one of the two surveys undertaken, because so many of the questions were either badly translated from English to French by the organizers or from French to Arabic by the

interviewers and because of heterogeneity in interpretation among interviewers.

In the last survey I participated in, I made it a point of handing over the first draft of the questionnaire to the interviewers and asking for their comments and suggestions. I subsequently discussed the questions with them individually and as a group, both in French and in Arabic. This procedure minimized the probability of misinterpreting questions and made the data collected more comparable in the sense of referring to the same entity.

Salem Gafsi, IBRD (Tunisia)

Translating Questions Gives Interviewers Good Training

In Nigeria we spent a lot of time on translation. Using the interviewers to do this in plenary session proved excellent for training them. Later their translations were translated back into English, in front of them, by an outsider. The method was useful although it took at least a quarter of an hour per question. Later, we broke the interviewers in small groups, each assigned its own section of the schedule to translate.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

"Back Translation" Helps Clarify Questions

The fidelity of translation is determined through *back-translation*, a process whereby an individual attempts an ad lib translation of a question and another translates the ad libbed question back into English. This continues with different back-translators until the back-translation is consistently equivalent to the original question. At the same time, untranslatables may be detected if English words can be heard to survive the ad lib translation.

Joseph Ascroft, University of Iowa (East Africa)

Literal Translations Contain Pitfalls

The construction of questionnaires is almost standardized. It is therefore not the most difficult part. The greater task is the translation of the questions into the local language.

Some concepts do not have equivalents in the local language. A good example is the word *security*. In our research in Machakos we were interested to find out whether parents regard their children as security. The meaning we wanted to convey was of the type of security one gets from a large bank account or life insurance. To the translator, the immediate meaning was whether the parents feel protected in the physical sense by their children. This is a genuine African idea; you cannot beat the father of six at a beer party without taking into account what will happen to you when the sons know of it. We found it necessary to ask numerous questions in order to tap our intended meaning.

T. B. Kabwegyere, University of Nairobi (East Africa)

DEFINING THE UNIT OF DATA COLLECTION

In terms of defining the unit of data collection attempts should be made during the data collection phase to use the definitions used by farmers, which may in fact differ from the unit of analysis ultimately adopted by the research worker. "Imposing of definitions" by the research worker during the data collection phase will only result in confusion in the mind of the farmer and the increased possibility of inaccurate or missing data. For example, the research worker may wish to define a field as "a contiguous piece of land farmed by one household." The farmer may redefine such an area as more than one field, based on different tenure rights, different household members farming parts of it, different crop enterprises in parts, etc. When, however, farmers' definitions are used, it is important for the enumerator to be informed by the research worker of the various possibilities (these can be ascertained in a pre-

survey) and to ascertain those actually used by each farmer he is interviewing.

In many studies, the unit of data collection is the household. The assumption is often made that this corresponds both to a *production* and a *consumption* unit. Unfortunately, this is not always so (e.g., for field clearing, different units may join together; there may be a regular seasonal variation in the size of the household, etc.).

In production studies involving households as units of data collection, the household head is often interviewed concerning details about the household (in the case of consumption studies the women would of course be interviewed). The assumption is that he knows everything concerning the activities of that household. This is sometimes suspect (e.g., large households, work on fields under control of other household members, activities of women, etc.). There is, as a result, a possibility of information being missed.

Possible ways of overcoming these problems can, of course, be devised. One possibility is to interview every household member (which is expensive and difficult). In the case of labor data, another is to try to elicit a list of all household members who were engaged in particular activities on certain days, or better still to account for all "activities" (including resting) for every household member during daylight hours.

(From the Beirut seminar working group reports)

VI. PROBLEMS WITH SPECIFIC VARIABLES

WHEN DIRECT MEASUREMENT IS ESSENTIAL

Direct measurement (of field sizes, crop yields, etc.) becomes important:

1. When the farmer has no concept of the magnitude of a particular variable in terms of a local measure readily and accurately convertible into the unit of measurement appropriate to the research. Estimates of land areas by farmers in many parts of Northern Nigeria fall into this category.
2. When memory recall is likely to be poor because the event is seen as relatively unimportant in the daily activities. An example is the harvesting of a few cobs of corn from a field on the way home at the end of each day, to be eaten immediately. When harvesting takes place in small amounts over a long period, as in this case, yield plots may be the only feasible way to get accurate yield estimates.
3. When variables must be converted from one type of measurement to another for research purposes (e.g., farmers tend to use volume measures of grain production, while farm management analysis ordinarily requires measures of weight). In such cases, conversion ratios need to be reworked several times a year because the volume/weight relationship varies not only from farm to farm but also from season to season.

One general rule that has been used in collecting information from farmers has been that to avoid possible confusion it is desirable to use the definitions, terms and measures he (i.e., the farmer) is happiest and most familiar with. This is often not the most convenient way of looking at things as far as the research worker is concerned, but is most important in trying to get as accurate information as possible and minimizing interviewee frustration. Examples of things that can fall into this category are definitions and names of fields, estimation of time with a Muslim prayer-time table, use of volume measurements such as *mudu*, bundle, *kunski*, etc.

David Norman, Ahmadu Bello University (Nigeria)

WEIGH COSTS, BENEFITS OF INCREASED ACCURACY

The sources of inaccuracies in the measurement of input and output are many. Different researchers have used different methods to minimize or eliminate these sources of error, but a guiding principle must be not to invest unnecessarily on attaining data accuracy beyond what the aims of the study require.

O. Ogunfowora, University of Ibadan (Nigeria)

Some Areas of Response Raise Special Issues of Reliability

With frequent interviews, a reasonably accurate profile seems to be obtained as to such expenditure items as capital invested in the farm (e.g., costs of hoes, cutlasses, extension of acreages), variable farm costs (principally hired labor), major non-farm variable costs (e.g., school and medical fees), and investments (e.g., bicycles, building materials). The same does not seem to hold true for petty trading and other personal expenditures (food, clothes, gifts, etc.).

This lack of repeatability in response is no doubt due partly to the farmer's unwillingness to divulge what he regards as highly personal information and partly to the fact that as other members of the household are responsi-

ble for these expenditures (particularly the wives), he is not really aware of their magnitude.

Similar problems are also observed when establishing the income of the farm family. While farmers seem to be willing to divulge information on farm sales (cross checks may also be made on this item), incomes from non-farm activities and gifts seem to be less readily obtained. No doubt there is a lingering concern that the enumerators may be associated with tax or marketing board agencies. Information collected on the financial transactions of the farm seems to be more realistic than that related to the household.

John Flinn, IITA (Nigeria)

Income Proxies Give Satisfactory Measure

In Kenya, we believed at first that we could not ask farmers about their incomes. But we tried in the panel study by asking farmers what they got for their maize, their beans, their milk, etc., what they got from other jobs, from relatives, etc. When all was added together, we found we had a measure of income which proved of great discriminatory power.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

PROBLEMS WITH SPECIFIC VARIABLES: OUTPUT

The basic problem in measuring output is that throughout most of Africa and the Middle East products are measured by volume rather than weight (the unit researchers usually prefer to use). There are three basic methods of estimating output by field:

1. Standardization of local units.
2. Weighing part (yield plot) or all of the crop.
3. Special techniques.

Standardization of units: Estimates are obtained from the farmer as to the number of units harvested in local

measures (e.g., bag, basket, bundles, etc.). Weight for such local units of measurement is derived by weighing a sampling of them (usually five or more). The resulting average weight, times the number of units harvested, gives an estimate of total production. In standardizing local units a number of samples may be necessary because local measures can vary from field to field, farmer to farmer, and season to season. The method is not satisfactory when the crop is harvested in pieces over a period of time (i.e. non-registered continuous data), as is the case with cassava, yams, etc.

Weighing: Weighing the whole crop is generally too expensive and time consuming. Consequently, yield plots are often used. This method appears to be the only alternative with crops harvested in small quantities over a long period of time (i.e., non-registered continuous data). The yield plot method is expensive in terms of time, supervision, and therefore money. It also yields faulty estimates when there are large variations within each field, because it is difficult to have more than one plot per field.

Special techniques: These include such devices as asking how many bags (e.g., of wheat) are produced per bag of seed. This would not be possible in the case of crops harvested over a long period of time and would be of doubtful value when the seed is small and relatively little is required per unit of area (e.g., millet). Another special technique appropriate for cash crops is the estimating of volume from value of sales to marketing boards, commercial firms, etc. Estimates from this method present problems if farmers are likely to have received prices lower than the announced price, if quality or grading is used in determining price to the farmer, if cash received by the farmer is decreased by the amount of credit received from the organization earlier in the year, and if not all the crop is sold to the institutions (e.g., part of the crop is also used as food for the household).

Unusual problems in estimating output arise with crops like sweet potatoes and cassava, where the leaves as well as the roots may be harvested, and also in estimating yields of minor crops.

(From the Beirut seminar working group reports)

Identifying Local Units of Measurement

In every locality, we found farmers using their own local units of measurement for area and volume. While the national units of measurement for area are the feddan (1.038 acres) and the acre, the farmers use "habel" and "gadaa." In the case of yields, instead of using tons they use sacks or "guffas" and "tins." Not only this, these measures vary from one locality to the other. It is often not possible to establish a single value for any of these units. The situation is particularly bad in studies of vegetable crops. In spite of our clear instructions to identify all units, many of the interviewers fail to do so.

A. M. El Hadari, University of Khartoum (Sudan)

Standard Measurements May Be Unknown

No problem arises when one asks a progressive farmer, who produces for the big towns or whose produce is sold through a cooperative, "How many sacks of maize, potatoes, tomatoes, etc., did you harvest?" But we are usually dealing with peasants who produce what they eat and perhaps a little surplus which they sell in the local weekly market. In Ukambani, the peasant will tell you how many times he filled his basket, or may simply tell you that he filled his barn with maize (that is to say, that he had a good harvest).

The assumption that rural people are familiar with measures like the "sack" is made too freely. One should not forget that many people do not use these measures. Nor is there any standard basket or barn that one could use to establish the correct measure. A lot of rural people are primary producers and use their own primary units. The

translation of these units into more widely known units is a task a rural East African researcher has to be prepared for. One does not get the precision that one wants in these circumstances, especially when one relies on survey data only. The big challenge is to make the language of research take into account the local language.

T. B. Kabwegyere, University of Nairobi (East Africa)

Standardizing Customary Measures

In our study area, each farmer has a basket called a "kuna" with which he measures the amount of grain produced or consumed. However, these baskets are not of a standard size. To correct this shortcoming, we measured and recorded the capacity of each farmer's kuna in kilograms and by grain type. The enumerator could then collect yield, consumption, and sale information from each farmer in number of his own kunas and convert this easily into kilograms for recording.

Essentially the same technique was used in standardizing liquid measures. We used graduated cylinders to check the volume of each farmer's own containers in liters. Farmers could then report relevant information by container types and this report could be converted into liters by the enumerator.

Getachew Teclé Medhin and Telahun Makonnen, University of Addis Ababa (Ethiopia)

REQUIREMENTS OF THE YIELD PLOT METHOD

For cash crops that are already sold, such as cotton and coffee, it is easy to determine the yield if there is a record of the sale and the acreage is known. For other crops, a yield plot method or some other sampling method must be used, as it is usually impossible to record the total harvest from a field.

Using the yield plot method in Zaire, we first lay out in the field one or several plots of a given size area using some random method. These plots are cultivated and

harvested along with the rest of the field, but the yield for the plot is carefully determined and serves to calculate the total yield of the field. Usually, there is an upward bias to yields derived by the field plot method, as farmers tend to harvest somewhat outside the yield plot.

Under variable plant densities and heterogeneous crop mixtures, with a mixture of annual and pluri-annual crops and no well established planting and harvesting dates, the yield plot method does not give reliable yield estimates. Instead, we record all products harvested from the fields, in local measures and on a twice-weekly basis. In Zaire, for example, most of the fields in our survey with food crops were quite heterogeneous and the yield plot method was not used.

Eric Tollens, National University of Zaire

DRAWBACKS TO YIELD PLOT SAMPLING

Our basic procedure for estimating crop yields is for the enumerator to record, during his twice-weekly visits, the farmer's own estimate of the number of baskets/headloads/tubers of each crop taken from each field in the preceding three (or four) days. During these visits the enumerator weighs a number of loads of local measures so that he can convert these volumes to standard weights. Where relevant, threshing or processing percentages are also recorded.

In special cases we have used yield plots to estimate output. Cropping density and spatial organization of each crop in a 100 square metre quadrant are recorded for this purpose. The farmer is requested to notify the enumerator when he plans to harvest the quadrant (which has been marked with long stakes), so arrangements can be made for the enumerator to be present to weigh the crop(s) taken from the ground.

This method of yield sampling is extremely time consuming. It is difficult to schedule the enumerator's time to ensure that he will be present for the harvest, the plot may be harvested over time for family consumption, and the enumerator may not be aware that the quadrant is to be

harvested. These difficulties, coupled with the statistical problems resulting from the enormous heterogeneity of plots due to the spatial arrangements of crops, tree stumps, logs, termite hills, soil variability, animal damage etc., have led us to regard this procedure as a check, rather than as a standard method for estimating crop yields. Usually the harvesting of sample plots has given yield estimates that are considerably biased upward.

John Flinn, IITA (Nigeria)

SIDE BENEFITS FROM TEACHING YIELD MEASUREMENT

In one of our field experiments conducted in Kenya (introducing hybrid maize) a special problem was the measurement of yields (to see whether the change had been worth while for the farmers). We knew local maize brought around four bags per acre on the average. But it was of special interest to learn how near farmers could come to achieving the 25 bags per acre possible with hybrids.

We went out to our sample of participants armed with scales, bags, measuring ropes, etc. (We had abandoned the idea of also measuring moisture content.) But we found most of the farmers had already harvested their maize just the week before (our intelligence had been wrong), and that we could locate only a few rows of plants from which the women had not harvested green maize. All that could be done was to ask the respondents to tell us how many bags they had harvested. (The answers worked out to an average of 11.4 bags an acre, to which one must add the maize eaten green.)

The experience brought one of our Kenyan colleagues to the idea that it would be essential to teach farmers how to measure their own yield (improve their feedback) as a prerequisite for encouraging them to use better farming methods. The frequently observed fact that farmers do not adopt an improved practice unless it provides almost 100 percent improvement in yield may be largely due to the

fact that unless farmers use precise measurements, only a very large change will be clearly visible.

Niels G. Röling, Agricultural University, Wageningen
(Kenya, Nigeria)

CROPPING MIXTURES INTRODUCE PROBLEMS

In our Kwara state study, we were able to use field area as our unit of measurement regardless of the crops in the mixture, and all the crops produced in the field constituted a single activity. This approach saved us from the tedious task of allocating inputs and yields to the component crops in the mixture.

Joint products present probably the most challenging single problem in the measurement of input and output. Most of our sample farmers grow their crops in mixtures. Some crops in the mixture occupy the land together for the entire growing period, others jointly occupy the land for only a brief part of the growing season. For the time they occupy the land together, any operation on one crop directly or indirectly affects the others in the mixture. Thus, the problem of allocating resources to each crop in the mixture becomes extremely difficult.

O. Ogunfowora, University of Ibadan (Nigeria)

ONE APPROACH: SIMPLIFY LIST OF COMBINATIONS

The problem of allocating inputs within a cropping mixture is magnified when one considers the large number of crop combinations found within a single village. The number of combinations to be studied must somehow be reduced to a manageable number below that observed in reality.

One way we have done this is to delete food crops from the mixture when they represent less than five per cent in the density of the field, make up less than five per cent of the total value of the cropping mixture, and by themselves account for less than about five per cent of the

labor allocated to the plot. Obviously it is not easy to draw this line precisely, especially in regard to the allocation of labor to the different crops, and arbitrary judgments have to be made. Nevertheless, Zuckerman has reported using this approach successfully to reduce 650 crop combinations to a manageable figure of 12 combinations (four sole-crop, six two-crop, and two three-crop) which accounted for over 85 per cent of the recorded labor used in three villages.

John Flinn, IITA (Nigeria)

OBSERVATION SUPPLIES DATA ON PRICE

Retail price data can be collected by watching a number of market transactions and recording prices charged per unit of local measure (e.g., cup). It is necessary to weigh a unit of local measure each time price data are collected, since weight often varies seasonally. The research worker or enumerator should not himself do the buying, since this would influence price.

(From the Beirut seminar working group reports)

Cautions in Utilizing Price Data

Prices of major crops and foodstuffs were collected each month from wholesalers at the local bulking markets; prices paid to and by farmers each week were also recorded. However, besides variations in price per unit between markets and over time, there may be variations in the volume of the basic unit (agricultural produce typically being sold by units of volume/bunch/tuber rather than by weight). In consequence, in addition to collecting agricultural prices the enumerators must weigh a number of local units of each crop to enable prices per kilogram of product to be derived.

John Flinn, IITA (Nigeria)

Market Sales Records Need Scrutiny

Reliance on sales records at a cooperative society or other purchasing center may be subject to serious error if "black market" operations are at all common. In Tanzania we have found that some producers sell part of their produce through another party at the same cooperative center or sell some output to other purchasing agents, an illegal practice. Obviously they will be reluctant to divulge such information to researchers, and the sales records of the cooperative center will not give a true picture.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

PROBLEMS WITH SPECIFIC VARIABLES: LAND

Only in very limited parts of Africa or the Middle East do farmers have an idea of acres (hectares). Care must therefore be taken not to ask farmers questions about the number of acres they have. A positive answer to such a question is less likely to imply that a farmer knows what an acre is than to reflect his desire to "keep face" without exposing his ignorance.

Two main types of estimate of size of field can be used:

1. Use of local measure calibrated through proxy variables (the cheap method).
2. Direct measurement (the more expensive method).

Local measures are calibrated by taking a sample of fields, obtaining values for the proxy variable (e.g., number of heaps, number of days taken to ridge, seed used, etc.), and relating it to the actual sizes obtained through direct measurement. A regression relating these two variables can then be used in predicting the sizes of other fields on the basis of estimates of the magnitude of local measures. The main advantage of the method is that it is quick, easy and therefore cheap. The main disadvantage is that it is prone to high measurement errors since generally the local

measures are not well standardized from field to field or farmer to farmer.

Two main types of direct measurement have been used:

1. Aerial photography.
2. Various combinations of compass or angle finder and chains, measuring tape, measuring wheel or range-finder.

Aerial photographs (e.g., on two-diameter enlargements of a scale 1:10,000) involve the tracing of the field boundaries in the field and then measuring the area with a planimeter in the office. This method is quick and provides a complete field map of the village, which in a settled agriculture system precludes the possibility of fields not being disclosed (all the other methods discussed have this potential problem).

The disadvantages of aerial photography are that it is very expensive, requires skill in map interpretation (usually necessitating the research worker being present), and is inapplicable in areas where there are many trees.

With reference to other methods of measuring fields the following points were noted with respect to equipment:

1. It was claimed that the angle finder might be less subject to "reading errors" than a compass.
2. In forest areas tape measures, chains, and possibly range-finders are more practical than a measuring wheel.

It was agreed that there should be an attempt to ensure that checks are built into any of the methods used. These can take two forms:

1. In the field check, after mapping, that the sum of the angles recorded for the field be, for example, within 10% error of (180 degrees) (N-2), where N = number of sides.
2. In the office check, after drawing to scale, that the closing error be no more than a specified amount (e.g., 10%).

Failure to meet either of these criteria would mean remeasuring. This provides a check on the accuracy of the measurement carried out in the field by enumerators. Since a skill can be developed in measuring fields, it was agreed the field measuring teams who concentrate on the job are desirable. Other points that emerged with respect to land measurement:

Land measurements, particularly in areas of shifting cultivation, are valid for only one point in time and are therefore a very expensive form of data to measure. In areas of shifting cultivation and/or multiple cropping it may in fact be necessary to measure more than once a year due to field boundaries changing.

The best time to measure is just after planting or after harvesting of the main crop. It is neither so feasible (because of the height) or desirable (because of trampling crops) to measure fields in the weeks immediately prior to harvest.

Recognizing that there are some settings and some individual cases that contradict the general view, it was agreed that farmers do not usually appear to object strongly to having field sizes measured.

A problem not directly related to land measurement but of concern to the research worker seeking to collect information about individual fields is field identification. Names of fields given by farmers; distance, time, and direction of fields, etc., have been used with varying degrees of success. An idea from Latin America worthy of serious consideration is to have the enumerator on an early visit develop a map of the approximate locations of each field in relation to the farmer and the interviewer whenever data are being collected by field.

(From the Betrut seminar working group reports)

Essential to Understand Local Land Measurement Units

In Kenya, we worked in an area where farms were fully registered. As far as owned land is concerned, we could get farm sizes accurate to one decimal point from the registra-

tion records. Renting proved to be quite another matter, as was the use of land owned in settlement schemes that were many miles away; however, we only discovered their relevance when we got to know the area better.

In Western Nigeria, farmers did not know the size of their farms in acres at all. However, they could guess the size in terms of "shillings and pence." These represented the number of yam heaps of expected yield, expressed in bags of cowries and then translated into money terms at an exchange rate which reflected the value of cowries at the time the colonial government did away with the cowries in favor of coins.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Direct Questions on Land Area Often Unrewarding

Perhaps the more difficult task for an East African survey researcher is the question of estimation of measures. "How much land do you have?" This question anticipates an answer like "I have ten acres" or "six hectares." The area in which we are carrying out "The African Family Project" has had very little land adjudication. What does an acre/hectare mean to a person whose unit of production is what he can cultivate with his hoe? To say that an acre is equivalent to a football ground does not help, because this also assumes that the respondent has experience with a football ground. Yet knowledge of how much land a man has is very important. One possibility is simply to walk over the land with the respondent and make an estimate, but this will involve all the risk and error that is inherent in such estimations.

T. B. Kabwegyere, University of Nairobi (East Africa)

Farmers Often Lack "Area Unit" Concept

Assessments of farm size were made by pacing and measurement and, in the cocoa areas, from official survey records. The ease with which cropped area could be

estimated varied from area to area. In Kisii it was facilitated by the layout of farms in long narrow strips across the contour. In Geita cultivation of crops on five-foot ridges also helped measurement. The calculation of tree crop acreages, when trees were at a standard spacing, was easier than with annual crops.

In only a few cases had farmers any concept of unit area. Where it existed it was usually associated with some factor such as the payment of subsidies or loans on an acreage basis, as in Mazabuka; registration of land, as in the cocoa area of Ghana; the availability of a tractor hire service with unit charges on a per acre basis; or, as in Teso, earlier government policy to promote field layout in strips of standard width, usually 75×35 or 140×35 yards.

Victor Uchendu, University of Illinois (East and West Africa)

CONSIDERATIONS IN FIELD OR PLOT MEASUREMENT

In most of Zairean agriculture, shifting cultivation (shifting of cultivated land around the habitat of the farmer in search of fertile land) is practiced. In savannah areas, a new plot is turned into a field by cutting and burning the savannah grasses. In the forests each year farmers claim new parcels of land by felling trees, slashing and burning. Fields are mostly quite irregular and can best be approximated with a polygonal. Sometimes it is very difficult to determine the boundaries of the field, as fields fade into the forest and vice-versa. Usually there is no clear boundary to the field.

Fields should preferably be measured while the crop is still young or after harvesting, in order to minimize crop damage as a result of walking through the field. But in the central basin of Zaire (equatorial rain forest), seasons are not well defined. There is no pronounced wet or dry season. With intercropping on most fields, planting as well as harvesting is often a continuous activity until the field is abandoned and returned to fallow, usually after two to four years of cultivation.

What also complicates matters is that once a piece of forest is burned and cleared, often only part of it is planted. Some of the land may be planted six months to a year later as the need arises. Thus, the field size is variable over time. In that case, we measure field size just before the harvest of the major crop or crops if that is possible. Some fields had to be measured twice during the survey.

Eric Tollens, National University of Zaire

Sensitivity About Land Holdings

In Nigeria we have found that the main problems in estimating farm size are the occasional farmer's forgetfulness, assumption that we are not really interested in each plot, or unwillingness to divulge all the fields he farms. Often as the survey progresses and the farmer becomes less suspicious of the interviewers he will disclose the location of additional plots. The existence of such fields also becomes apparent when the farmer is seen by the interviewers working on these plots and this information is recorded in the field diary, or when the twice-weekly labor use form is being completed and the farmer is unable to explain where he worked on a given day.

John Flinn, IITA (Nigeria)

Proxies for Field Size Not Too Helpful

We have made some efforts to get farmers with whom we have worked in Northern Nigeria to estimate the number of days it takes one man to ridge a particular field by hand, and from this information to predict the size of field by use of a simple regression equation. However this at best is a very approximate measure due to differences in soil texture, etc. In areas further south, numbers of yam heaps have also been used in an analogous way. Usually, however, direct measurements offer the only really reliable way of estimating areas.

David Norman, Ahmadu Bello University (Nigeria)

Few Good Alternatives to Direct Measurement

The measurement of fields is particularly a problem in areas where aerial photographs cannot be used, either because of thick vegetation or the preponderance of shifting cultivation which leaves no permanent and easily recognisable field boundaries. (In addition, aerial photographs are often too costly for the farm survey budget.)

Researchers have two options open to them. They can rely on local standard measures of size, or they can use tapes, field compasses and other field measuring equipment. Local standards involve the estimation of farm size by the number of heaps of yams or cassava, but since many of the farmers usually plant on the flat, this method had limited application in the Kwara State study. The use of tapes and field compasses was found to be of value in this study, since all the AAs/FOs have a good mastery of the technique.

O. Ogunfowora, University of Ibadan (Nigeria)

Field Measurement Techniques

In rain forest areas, aerial photographs are of limited usefulness to delineate fields because of the dense vegetation cover. The cost of aerial photographs may also be prohibitive. In forest areas we have measured fields using measuring tapes (20 m. in length) and field compasses. (Measuring tapes are easier to use than measuring chains.) On level savannahs, a measuring wheel can be used instead of measuring tapes. Measuring wheels can not be used in forest areas because of forest debris and tree stumps in the soil.

It takes two people to measure fields, and in Zaire the local agricultural extension workers proved willing and helpful. Field measurements are plotted on graph paper to an appropriate scale. A 360-degree protractor is used to report the azimuths. Graph paper facilitates the drawing of azimuths, with the northern direction always indicated by the vertical lines on the paper. Acreage is then determined with the aid of a planimeter.

At the beginning of a survey, field enumerators struggle with finding an appropriate scale to use in drawing the fields, but this problem is resolved with experience. Measuring and drawing errors are easily checked by looking at the "closing gap" of the polygonal. If the closing gap exceeds 10 percent of the perimeter, fields have to be remeasured.

Eric Tollens, National University of Zaire

IDENTIFICATION OF FIELDS AND PLOTS

While the farmer usually has a clear picture of the location and boundaries of each of the plots he has under cultivation and fallow, he rarely can translate these into terms which can be consistently converted to acres or hectares. This is why it is usually necessary to physically measure the fields of each farmer.

At the start of the survey we have given each field a reference number and marked it with a disk of colour on a tree or rock to prevent subsequent confusion between the farmer and the enumerator. A sketch on the field data sheet shows the shape and location of the field, the time taken to walk to it, and the approximate distance from the field to the farmer's home.

Each field is measured by the enumerators using a tape and field compass. Following Norman's suggestion, a quick check is immediately made of the survey by comparing the sum of the angles with $180(N-2)$ where N is the number of sides of the field. If the two estimates differ markedly the field is remeasured. The field is then drawn to scale in the office and the area measured with a planimeter. If the closing error is too large (more than 10 per cent of the circumference) the field is remeasured.

Where the bush or crops are so high that it is not possible to use a tape and compass, the number of heaps on the field is recorded and the area estimated from a knowledge of the density of the heaps.

During the visit to the field, a composite soil sample is taken for laboratory analysis. The filled data sheet shows

soil texture, slope, relief, drainage and evidence of erosion. Information on prior and present land use, cropping densities, weed and pest infestations, method and cost of acquiring the land, and form of tenure are collected on another form, the "land-in-use form," which is updated during the course of the year as the number of plots or the crop combinations in a field change.

John Flinn, IITA (Nigeria)

No Easy Scheme for Field Identification

Since most of our measurements were to be obtained from fields farmed by the respondents, our starting point was to obtain accurate data on the number and size of fields farmed by each respondent. It is not unusual for a farmer in one production season to cultivate three to five fields widely scattered and containing different combinations of crops and crop mixtures.

Field identification is especially a problem when respondents are to be interviewed away from the fields in which the operations are performed. Identification by the crops grown becomes difficult and confusing since it is likely that two or more fields may contain the same kinds of crops either alone or in combination with other crops.

The field identification method which Norman has used involves colour markings which the farmers can recognize and identify. The colours are painted on rocks or tree trunks, preferably at the usual point of entry into the field. In the Kwara State study we used a combination of colour markings, crops and location to identify fields.

O. Ogunfowora, University of Ibadan (Nigeria)

Soil Maps Too General For Village Level Use

Land is not a homogeneous input, because of differences in soil fertility. Therefore, it might be useful to take a soil sample when measuring fields. Even though fairly detailed soil survey maps are available for several regions in

Zaire, these maps may be too general and/or inaccurate for village level studies.

Eric Tollens, National University of Zaire

PROBLEMS WITH SPECIFIC VARIABLES: LABOR INPUT

Three ways of estimating labor used are:

1. Survey approach (i.e., one short interview).
2. Cost-route approach (i.e., multiple interviews).
3. Direct measurement.

The survey approach has the potential of the highest measurement error, and direct measurement the lowest. This is because labor data (particularly family) are a continuous non-registered kind of data.

In using a *survey approach* the ordinal ranking of different farmers on basis of labor hiring, for example, is feasible. Considerable doubts were expressed about deriving any quantitative estimates of labor use in such an approach. It has been suggested this may be possible if generalized or "normal" experience can be explored, rather than direct recall of specific incidents.

Reservations were expressed as to whether group interviews will result in trustworthy estimates concerning average labor inputs for a specific crop enterprise on a specific field. More reasonable estimates of labor input may be possible if questions are asked in terms of larger time units (e.g., not hours or days, but weeks in which operations were undertaken).

The cost-route approach can provide reasonable estimates if time units familiar to the respondents are used (e.g., estimation of hours using Muslim prayer times). One, two or three interviews a week are usually used to collect this type of data.

Direct measurement permits accurate time estimates of labor input, since a watch can be used. Nevertheless, the energy expended on work is still dependent on two factors:

1. Number of hours worked.
2. Effort used per unit of time (e.g., digging or ridging less than weeding).

An attempt to get information on these is important in assessing the seasonality of farming and the potential capacity for additional work. The direct measurement approach gives good estimates but is very expensive. The cost-route approach attempts to overcome this problem by estimating time in hours and by operation (which can be related to effort used).

Adequate comparisons of labor input require the researcher to find ways to sum up the contributions of a variety of kinds of workers. Labor data usually begins with the classification of family labor and hired labor. The amount of hired labor used varies with the crop and season and also with the nature of the household. Both within and across the two categories of hired and family labor, the work force is drawn from both sexes and a wide range of ages. An analytical problem is how these can be aggregated into "man hours" and "man days." Several arbitrary weighting systems have been used, and although they seem to be reasonably satisfactory there is room for research to develop a weighting scheme that properly reflects:

1. Age
2. Sex
3. Type of operation
4. Customs of the area.

(From the Beirut seminar working group reports)

Accounting for Time Reveals Labor Input

The collection of specific disaggregate daily labor information on the basis of field activity, age, sex and family role is one of the main features of cost-route surveys. It is also one of the main reasons why these surveys are expensive. Although all hired labor is paid by the day, it is necessary to move to a basis of man-hours for the different

work activities. For this purpose we have found it necessary to ask all members of the family, excluding only children below the age of eight, to account for their time utilization between 6 a.m. and 6 p.m. every day of the week. (This time interval corresponds with daylight time, as the enumeration areas are close to the Equator.)

Eric Tollens, National University of Zaire

Issues in Gathering Labor Input Estimates

Farmers appear to have little difficulty in specifying what they regard as "normal" labor inputs for a given plot over time, who performs each operation, and how much is family labor and hired labor. Such estimates of labor inputs are probably adequate for most planning purposes.

Three major problems emerge in analyzing and interpreting labor data. First is the "arduousness and urgency" of particular farm tasks, which, together with the farmer's health and environmental factors (e.g., tilth of the soil), may result in substantially differing rates of work being observed both within and between farms over time. The second problem, given the diversity of labor inputs, is deciding on the weights to be used when aggregating man, woman, and child days to standard man-days. The observations of the author agree with the persuasive arguments presented by Spencer for the use of weights of 1.0 for men and women and 0.5 for children when estimating standard man days.

John Flinn, IITA (Nigeria)

SPENCER'S WEIGHTING FACTOR WIDELY ACCEPTED

In Zaire, there is a customary division of labor between sexes—land clearing, felling trees, burning, hunting and fishing being reserved for males and weeding and crop maintenance for females and children. Planting and harvesting is usually done by both sexes.

In the final analysis any conversion of woman and child labor to man labor units is arbitrary. I utilize Spencer's

conversion scale, giving women a 1.0 weight and children above seven years and under 15 years a 0.5 weight; I believe that in the types of work they do in Zaire, women are as efficient as men.

Obviously, age and sex are important variables in measuring the labor input as well as the task being performed. Work studies are needed to determine the common denominator and the real weights to use in aggregating different labor inputs. These studies, however, are generally not available in Africa.

Eric Tollens, National University of Zaire

TRAVEL TO FIELDS IS A LABOR INPUT

In the Kwara State study, labor input data were taken in man-hours and later converted into man-days equivalent. The time taken to travel from the farmstead to the field and from one field to another was regarded as a component of labor time, and represented a fairly significant proportion of farmers' daily labor input.

Actual labor time spent on the field was estimated by deducting the total travelling time from the total time spent. The travelling time was estimated by standardizing the average time taken by the farmer to travel from the homestead to the field and from one field to another. The standardization procedure was rather tedious in situations where the farmers have scattered fields.

O. Ogunfowora, University of Ibadan (Nigeria)

A Caution About Farmer's Field Travel Time

Counting travel to and from the field as part of the farmer's labor input is appropriate and essential, but it introduces an upward bias for labor requirements of crops located in fields further from the house. In large samples, however, this effect may average out as we find no particular reason why some crops always should be in one of the more distant fields.

Eric Tollens, National University of Zaire

Loan of Clock Improves Time Use Data

None of our sample farmers had any way of measuring time accurately, and as a result they had difficulty in giving us an estimate of the labor they used in agricultural production. To overcome this shortcoming, a clock was rotated among the farmers and each farmer was taught how to read it. Once this was accomplished, it was quite easy for each farmer to estimate the time he spent in various farm activities, since most of these activities are routine and more or less regular.

Getachew Teclé Medhin and Telahun Makonnen, University of Addis Ababa (Ethiopia)

MEASURING CAPITAL AND MANAGEMENT

Economists and sociologists commonly use different methods of estimating capital inputs.

The economist will usually begin with an inventory of assets used in production. An effort is made to place a monetary value on these assets (this is often difficult and somewhat arbitrary) and their useful life is estimated (again not an easy task). They then can be depreciated accordingly (usually linear).

The sociologist tends to make his inventory with the aim of developing a picture of the social relationships between households as well as among individual members of the household. He will ordinarily go beyond the inventory of assets used in production to include various household possessions from which information on levels of living and socio-economic status can be deduced. He is interested in amounts of formal or other education and training, previous work experience, and farm practices followed (which may, of course, involve costing of farm implements and other production assets).

Measuring management inputs has not yet been satisfactorily researched. Adoption scores, etc., are suspect

because of underlying assumptions, as are such proxy variables as years of formal schooling, age, etc.

(From the Beirut seminar working group reports)

MANAGERIAL INPUT STILL DEFIES MEASUREMENT

Managerial ability is an input for which no satisfactory way of measurement has been discovered. Some indirect measures involve years of farm experience, years of formal schooling, attitudes towards farming, knowledge of existing technologies, etc. This set of information can be obtained from a situational survey of the villages from which the sample farmers are drawn.

O. Ogunfowora, University of Ibadan (Nigeria)

PROBLEMS IN DEALING WITH QUALITATIVE VARIABLES

It is important to distinguish between measurements of:

1. Knowledge—this is a present quality which can be directly tested.
2. Practice—this is an evident form of behavior, in the past or at present, and therefore can also be verified.
3. Attitude—this is predisposition to behave in a particular way; it can only be genuinely verified in the future.

Satisfactory techniques exist to study knowledge and practice. It is often interesting to find if knowledge is closely correlated with practice, and if not, to determine why not (e.g., the farmer knows the value of using fertilizer but does not use it because he can't buy it). Knowledge is a necessary but not a sufficient condition for the adoption of a practice.

There is considerable debate as to how useful the usual standard techniques are for testing attitudes. Scales or indices (e.g., modernization index) unfortunately take time. Many of the attitude construct scales now being used do not relate well to other variables because the respondent:

1. Doesn't know about the subject.
2. Hadn't thought about it in that way before.
3. Doesn't wish to reveal his true feelings.
4. Is precluded by various constraints from acting along the lines of his expressed predisposition.

Knowledge about attitudes can be an important part of meaningful research in rural communities. We urgently need to learn more about how farmers and their families view their work, their communities, and other aspects of their lives. The attitudes of agricultural extension workers, health personnel, and others who work in the rural community are equally worth investigating. For both purposes, a great deal of exploration of new methods of attitude measurement is called for.

(From the Beirut seminar working group reports)

VII. RECRUITMENT AND QUALIFICATIONS OF INTERVIEWERS/ENUMERATORS

SOURCES OF FIELD STAFF

Recruitment of enumerators is a crucial phase in data collection. What to emphasize in recruitment depends first on the type of survey and second on the nature of the data to be collected.

In a *one-shot survey*, field work is conducted at a given point in time. The survey usually covers a large number of respondents and may involve the movement of interviewers from place to place.

In a *multiple-visit or longitudinal survey* the enumerator or interviewer must remain with or return regularly to the respondents over a long period of time, often a year or more.

For either type of survey, there are at least four possible sources/categories of enumerators. These are:

- University students
- Extension agents
- Teachers
- Locally unemployed/employable people

Each category has its own characteristics and/or peculiarities which should be considered with respect to any particular type of survey.

University Students

For many kinds of surveys, university students offer some serious disadvantages. Most university students are available for short periods of time, mostly during their vacations. This may not coincide with the schedule of the research, and may also prove to be a time when students want to enjoy themselves, are in a hurry to complete their assignment, and consequently do a bad job.

It is painful and difficult to use students who are reluctant to live in the rural areas, who complain about accommodation and other arrangements, and whose financial requirements and demands are heavy.

Some research workers also report a problem of students intentionally or unintentionally falsifying questionnaires. If they consider themselves to be clever, and if respondents give answers which appear to them to be stupid, they are prone to rewrite the answers in a more appealing and flowery language, with the respondents' answer being completely distorted. They may also unwittingly interpret answers before recording them and thereby distort their meaning. There are also cases in which the students may knowingly bias the answers because of their beliefs or because of their association with one or more of the hypotheses under test.

Despite these shortcomings, there are areas of research in which students can be useful enumerators. For example, they can be useful when the nature of the research is pedagogic, and in types of research in which their previous knowledge of the subject matter can help in getting better answers. They often have the flexibility to serve as research assistants and to supplement the work of other enumerators. In exploratory research, particularly, there may be advantages in having enumerators of University level of education who can play this additional role.

The consensus is that there are few advantages in using students as enumerators in closed-ended questionnaire surveys (unless there are definite pedagogic objectives involved). Where students are used, necessary precautions

should be taken to overcome some of the shortcomings listed earlier.

Extension Agents

Extension agents are government officials and their services usually can only be secured through a secondment arrangement.

- a. Partial secondment/release gives the extension agent responsibilities in the research project or survey in addition to his official duties.
- b. Total secondment/release allows the extension agent full time to work on the project.

Total secondment is viewed as the preferable arrangement. Those partially seconded face the problem of dual allegiance, which makes supervision and control rather difficult. Seconded officers may feel neglected or forgotten during promotion exercises. Thus in the case of partial secondment, they are likely to concentrate more on their official duties since these form the basis of assessment for promotion.

When a study extends for a long period, a Ministry is usually not willing to release its best qualified people because of the general shortage of extension personnel in the developing countries. There is always the risk that seconded extension workers will be withdrawn from the project when an important assignment comes from the top. There is also the possibility of discontinuity in data collection if an extension agent must take his annual leave during the research period.

Finally, many survey research projects represent an indirect evaluation of extension effectiveness, which may tend to influence the results if extension workers are doing the interviewing.

Extension workers sometimes feel that they know all or most of the answers to the points being investigated. They thus may tend to fill the questionnaires without reference to the respondents.

The shortcomings that have been mentioned should not rule out extension agents as enumerators, but only to serve as points to observe and guard against in any research project in which they are used. In some situations, their knowledge of the area and subject matter, their relationship with the potential respondents, etc., could be a great asset in the design, organization and administration of the survey questionnaire.

Teachers

Teachers are useful enumerators in areas where the number of educated people is small. They are most useful for short surveys. They are usually well respected by the local people, although sometimes a respondent may be antagonistic because he relates the teacher to the failure of one of his children in examinations.

If a teacher comes from another area he may be regarded as an outsider in the community; obviously this can have both advantages and disadvantages. In most places the teacher is likely to be seen as a member of a clearly defined group that includes agricultural extension workers, cooperative officials, and others. If this group is viewed as aligning itself with the richer farmers it will be viewed with distrust by others.

Locally Unemployed/Employable People

In many regions there are primary school leavers, secondary class four, school certificate or high school students with poor passes who are available for employment. Their use depends on the type of survey and the nature of questionnaires to be employed.

For closed-ended, well-structured questionnaires, level of education may not be too important so long as the enumerators have sufficient education to understand the questions and be able to fill in the schedules. For open-ended questionnaires, enumerators must have a higher minimum level of education to understand the questions.

and be able to report correctly the respondents' answers.

For the farm management type of survey, a minimum level of education and relevant technical knowledge about farming is required. It is a sound rule of thumb to use rural people to conduct rural surveys and urban people in urban surveys. It is virtually essential that enumerators understand the local dialect. One way to insure this is to recruit them from the same background and region (although not from the same village) where they will be interviewing. If they come from the same village problems may arise: a) family connections which may make excessive demands on their time and finances to the detriment of the research, b) difficulty in getting rid of an inefficient enumerator, especially if he comes from an influential family in the village, c) possibility of distorting or biasing the answers. However for some kinds of research involving households (consumption surveys or attitudinal studies) the balance may lie in favor of using enumerators from the same village area.

Enumerators of limited educational background and limited alternative employment opportunities are frequently very reliable. Their work represents their livelihood, and is more than a casual and passing interest. But they also require more intensive supervision and better training if they are to develop a commitment to the project beyond the financial remuneration it brings them in monthly salary.

Depending on the nature and goals of the survey, serious thought should be given to including women in the enumerator group. There are some kinds of information they are uniquely able to get, and this is not true simply of sensitive or intimate information like family planning or information on women's productive work. There are situations in which men and women researchers working together as a team can get more complete and accurate results.

Recruitment efforts can make use of several kinds of tests: a) a short verbal test designed to elicit attitudes towards rural areas and motivation for the job, b) simple

arithmetic test to show ability to deal with figures; this is particularly necessary in farm-management type surveys, and c) a practical test of local language competence.

Experience has shown some degree of correlation between performance in such tests and performance in the field.

(From the Beirut seminar working group reports)

INTERVIEWERS/ENUMERATORS ARE THE KEY LINK

Enumerators are the key link between the farmer and the research worker. We attempted to recruit holders of a West African School Certificate (WASC)—equivalent to grade 10 in the U.S. system—who had a pleasant personality and who were indigenous to the study areas but not known in the villages selected for the studies. The most suitable enumerators provided to be those between secondary four level (grade 8) and “failed WASC.” (Unlike those who have passed WASC and aspire to better jobs, such individuals have fewer alternative employment opportunities and generally proved to be the most conscientious and reliable employees.)

Due to short supply, it was often necessary to employ individuals of such an educational level as primary seven, who were able to complete the forms adequately provided they were closely supervised.

Before selection each potential enumerator was subjected to a simple arithmetic test, a test in the language of the area, and an interview at which specific questions were put by the research worker in English to a “farmer” (i.e., another employee of RERU) through the applicant, who acted as an interpreter.

David Norman, Ahmadu Bello University (Nigeria)

HIGH EDUCATIONAL STANDARDS INCREASE TURNOVER

While high level of education of the enumerators could enhance the efficiency of data collection, it has been found

to be associated with a high rate of turnover of enumerators. Enumerators with good passes in the school certificate generally use the project as a stepping stone to a better job in the city or admission to an institution of higher learning. We have solved this problem by appointing enumerators with either class four, a failure in school certificate, or a school certificate with a pass in grade three. These categories of enumerators have very restricted employment opportunities, and are therefore more likely to work hard in order to keep the job. However, we have found that many of them require more intensive supervision than do interviewers of higher educational qualification.

O. Ogunfowora, University of Ibadan (Nigeria)

PERSONAL QUALITIES OF ENUMERATORS

Enumerators must be hard-working and have the correct attitude for working in rural areas. This includes a genuine interest in and ability to develop friendly personal relationships with rural people. Although we have had one or two notable exceptions, we generally find that enumerators who have had all of their education in urban areas find it extremely difficult to live in rural areas and establish the necessary rapport with farmers.

Enumerators must speak the language of the respondents. Enumerators using interpreters further compound the supervision and data gathering problems. But we have found it inadvisable to use "sons of the soil"—persons from the villages where interviewing is being done. Outsiders who speak the local language seem to have little difficulty in being accepted by the host community. But getting rid of inefficient "sons of the soil" may mean abandoning an area in which several months of data may already have been collected.

Enumerators must be fully conversant with the purpose and scope of the study. They must also have a thorough knowledge of the survey instruments. Our enumerators are trained intensively for about ten days during which they

have field practice in completing the questionnaires. Only those who successfully complete the training course and pass the exams are employed.

Dunstan S. C. Spencer, University of Sierra Leone

I believe the crucial thing is to select one's interviewers in such a manner that they are as similar as possible to the respondents. Essential is that they come from the same area, speak the same language, and have the same ethnic background. People with tendencies to place themselves at a distance from rural life, and people who are very young, should be avoided.

In Eastern Nigeria, we had very good experiences with older village school teachers. In Kenya, we had excellent experiences with extension workers (as long as they were not of the opinion that they really should be in the University).

Ideal is the man who has settled for a career in the rural area. The problem is to get such people for temporary work. In Nigeria part of our interviewers were teachers on assignment from the Ministry of Education, part were people who were not employed. In Kenya we were allocated extension officers from the Ministry of Agriculture, which was possible because they had been assigned to the special area but did as yet not have specific tasks. The Kenya method had the advantage that one did not have to set up complicated conditions of service, insurance, etc.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

When we are recruiting enumerators to staff our longer-term studies (i.e., three months or longer), these are the qualifications that we consider important and therefore the criteria we try to use in selection:

- a. fluency in the language of the tribe or area being studied
- b. experience with the farming of the region

- c. five years of secondary school education in the English language (i.e., the West African School Certificate)
- d. a pleasant and enthusiastic personality
- e. availability for employment throughout the full duration of the project, with no other work commitments
- f. that they are not sons of the survey villages.

John Flinn, IITA (Nigeria)

The decision to use interviewers to help in the field is of paramount importance and can affect the course and nature of the research. With this in mind we selected field assistants for the Frafra study who had:

- a. previous experience in field research, census taking, or similar projects
- b. knowledge of Frafra migration or the whole concept of migration
- c. ability to speak English, Frafra (Tallensi or Nabdam, or Grune) and Hausa
- d. acceptance in the areas in which the interviews were to be carried out
- e. ability to devote substantial amounts of their time to the research
- f. ability to lead a simple life, with reference to the perceptual thrusts or expectations of the respondents.

John S. Nabila, University of Ghana

Based on our experience in Zaire we conclude that the enumerators for a farm business survey requiring only limited visits normally need *more* years of formal schooling and should be *more* mature than for a survey with regular twice-weekly visits. In the latter type of survey, enumerators meet frequently the same small number of farmers and repeat the same set of questions, and this requires less originality, initiative and adaptability than does a limited-visit survey of a larger number of farms.

It is important that enumerators be properly motivated

and supported. They have to realize the importance of their work and should never be allowed to feel neglected.

Eric Tollens, National University of Zaire

Recruiting interviewers is a problem in a country like Tunisia, where most people with a decent amount of education are either working for the government or still supported by it while continuing their education. This could be overcome, however, if surveys were timed to correspond with school recess. College students, especially when they are from the area surveyed, can prove to be good interviewers and good assets for the researcher during both phases of planning and conducting the survey.

Sex of the interviewer may also play a role in conducting a survey. In our field work in Tunisia I have had the chance of interviewing with both men and women, and I have to admit that we were better received by far whenever one of the team was a woman. This judgment is based, of course, on instances where respondents were men. However, it might still hold in case respondents were women, with the additional reservation that men might be asked to stay out.

Salem Gafsi, IBRD (Tunisia)

Roles for Both Male and Female Interviewers

In our current study we have decided that female interviewers should interview females while male interviewers interview men. Within the context of our study, however, it would not appear that male interviewers would have problems in interviewing elderly women. For the interviewer can easily fall within the category of "grandchild," which gives him greater license to be a nuisance!

T. B. Kabwegyere, University of Nairobi (East Africa)

Advantages to Hiring Interviewers from the Region

In several studies it has been necessary to have people

working for longer periods, particularly to follow up the various daily and monthly activities of the farmers throughout a cropping season. For example, our Gezira socio-economic survey continued for three years, and field interviewers were stationed in their respective areas for that long. In the private pump schemes study, it was necessary to have the interviewers in the field during a whole cropping season (i.e., July to March), to follow up all the agricultural operations till cotton picking.

By practical experience we have found it realistic to try to employ, if possible, people from the project area. Firstly, we do not have to worry as much about their problems of lodging and transport, since they live near enough to go to the farmers directly in the fields or meet with them in their villages during their free hours of the day. Secondly, they usually know all the people in the village and in neighboring villages in person. Thirdly, the farmers are not so suspicious as when an outsider visits them. Finally, in some instances it is not possible to communicate with the farmers unless you know their own local language.

It is not always easy to employ local interviewers, since most permanent residents of our rural areas are illiterate and those who have had some education usually migrate from the villages seeking urban employment. For this reason the people on whom we depend are school teachers, council clerks, etc. The experiment of using such people is one we have tried only once, in a recent agricultural credit study in the Gezira scheme, but it has worked fine so far.

A. M. El Hadari, University of Khartoum (Sudan)

Strangers to the Region Have Problems of Acceptance

The fact that our enumerators were all "strangers" to the areas where they worked was a major draw-back of the pilot study. Not only were they not returning to work in their home communities, they were working in all cases with ethnic groups different from their own. This was not

of importance when we interviewed in urban and peri-urban settings, especially since the latter was closer to the urban "ideal" type anyway. But there were definite problems in creating rapport between enumerator and respondents (adult and girls) in the rural Mwanza samples. Illiterate peasants and non-school girls in particular often were not fluent in Kiswahili, which meant that a language barrier existed. Some parents were understandably suspicious of the strange young man "from Dar es Salaam" coming to ask questions of their daughters. Given the objective of measuring attitudes towards women and school, rapport is clearly essential in getting valid responses. The data were therefore bound to suffer from this kind of non-sampling error.

Even though the enumerators in the pilot study were given two weeks at the beginning to get settled into the area, without formal interviewing procedure, this was only an expedient and hardly a substitute for having people working in their home regions.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

Students Can Be Effective Interviewers

We have made considerable use of students as interviewers, particularly during the summer vacation (April-June). This is working smoothly for various reasons. Firstly, due to their knowledge of agriculture they are collecting better data. Secondly, this is a kind of practical training for them, since they will get to know more about agriculture in general and the farmers in particular. Thirdly, of course, they get paid for this work. However, the availability of students is of course limited to the summer months.

A. M. El Hadari, University of Khartoum (Sudan)

REDUCING THE MERCENARY ELEMENT

What about research assistants whose main interest in the project is the money? The Department of Sociology at the University of Nairobi is trying to overcome this by involv-

ing graduate students and undergraduates in on-going studies as a form of "teaching through research." This means that the students do not collect data for the project alone, but also use some of it for their own research papers and theses, for which they get academic credit. In this way the research is in part their own and the mercenary element is reduced.

T. B. Kabwegyere, University of Nairobi (East Africa)

INTERVIEWER ENTHUSIASM CAN BE AWAKENED

Interviewing in East Africa is not considered a mean occupation. There is a certain prideful prestige which attaches to roaming the rural areas asking questions authoritatively. But to university students, it may be no more than a menial source of temporary income, to be entered into with a spirit of skepticism. When that is the case, they are more likely to question the motives of the researchers, to cheat by interviewing imaginary respondents, to doctor responses deemed to be un-African, to use interpretative jargon to record answers, or to interview bar-flies to avoid walking distances looking for sampled respondents.

My rule is to seek alert but *not* well-educated individuals, already experienced in my field (the communication of innovations in rural areas). Usually these are front-line extension agents who, if the authorities cooperate, are released for the duration of the study or who are persuaded to "moonlight" as interviewers on evenings and weekends.

My aim is to try to make them as excited as I am about the research, and particularly for them to see clearly that its ultimate objective is to make their own work more efficient and more productive.

Joseph Ascroft, University of Iowa (East Africa)

DATA IMPROVES AS INTERVIEWERS GAIN EXPERIENCE

There is a very definite skill in interviewing, and enumerators only gain this through considerable experience.

This is a much more important justification for trying to build a permanent cadre of recruiters than the equally valid point that there may be more professional commitment from the person who sees a chance of continued employment. It is wasteful to hire enumerators for a single study if there is any way to keep them for a longer period and spread the overheads that have had to be put into their training; we are more likely to get data of better quality from a permanent cadre trained over a number of years.

David W. Norman, Ahmadu Bello University (Nigeria)

Permanent Enumerator Staff Is Ideal

I have found tremendous advantages in employing a trained, experienced and permanent cadre of enumerators. The needs of the program may dictate that temporary staff be used, often local staff from other departments. This is easier for frequent-visit surveys, when expertise can be built up over the year they spend in the field. It greatly reduces the depth of information which can be obtained in limited-visit surveys, for which considerable interview skill is needed.

I have particularly tried to avoid the use of part-time temporary enumerators, who resent being burdened with an extra work load unless the incentives offered are particularly attractive. Supervision requirements also increase significantly when temporary staff are used.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

Incentives for Interviewer Continuity

The major causes of discontinuity in data gathering arise from a high rate of turnover of enumerators. Resignations of enumerators are less frequent when enumerators selected are persons with limited employment opportunities. In addition, some incentives and disciplinary measures can reduce the rate of resignation and achieve better work performance.

First, our enumerators are asked to sign an agreement that they will remain on the job for at least one production year. Second, we make the payment of salary contingent upon satisfactory performance of work. An enumerator may lose part of his salary if the quality of his work is bad or there is evidence that data are being concocted.

Some other incentive measures used include the provision of bicycles (with occasional reimbursement for repair expenses), payment of salary in lieu of annual leave, assurance of eventual absorption of the best field staff members into permanent positions, and the provision of raincoats, rain boots, papers and other facilities which could enhance their efficiency.

O. Ogunfowora, University of Ibadan (Nigeria)

Enumerators must be encouraged to stay in the job. For our type of study, in which respondents are visited regularly, it has proved advantageous to keep an enumerator in one area for the duration of the project. Enumerators are paid an attractive salary, a proportion (15-35 percent) of which is withheld monthly as a surety against the successful completion of their assignments.

Dunstan S. C. Spencer, University of Sierra Leone

We have found it useful to offer various incentives in order to retain field enumerators throughout the survey. Possible incentives include deferring part of the salary to the end of the survey with a promise to pay only if the enumerator stays on the job, using a labor contract which stipulates the terms of employment, and offering bonuses in the form of material and equipment such as raincoats, boots, watches, bicycles, etc., which can be kept by the enumerators at the completion of the survey. Needless to say, enumerators should be paid an attractive salary.

If enumerators have to travel, we have found it desirable to hire unmarried persons who are less reluctant to stay away from home for extended periods of time.

Proper maintenance and repair of transport vehicles

(bicycle, motorbike) should be taught during the enumerator training sessions.

Eric Tollens, National University of Zaire

"Borrowed" Staff Bring Problems

Experiences using enumerators borrowed from other agencies (e.g., Department of Agriculture) have produced mixed results. It is preferable to directly hire enumerators so there is no division of their responsibilities, the project having complete authority over their conditions of employment, benefits, where they are stationed, disciplinary action, etc.

John Flinn, IITA (Nigeria)

VIII. TRAINING INTERVIEWERS AND DIRECTING THEIR WORK

FIELD STAFF TRAINING NEEDS

The nature and length of training and the intensity of supervision depend on the type of survey and the nature of data to be collected. It is generally agreed that training should take place both in the office and in the field.

Office training should emphasize an understanding of the objectives of the study, the problems of the rural areas, and the usefulness of the data to be collected. It should also emphasize techniques of interviewing and the approaches to use to establish rapport with respondents. It is often rewarding to obtain full participation of interviewers in the development of the questionnaire, making this process an integral part of the training program. This gives enumerators an insight into the conceptual frame of the research that may put them in a better position to administer questions correctly.

It is generally useful to prepare a reference manual which contains all the questionnaire or survey forms together with the instructions on how to complete them. Such a reference manual is particularly useful in a multi-visit type of survey.

In the training period, every question in the schedule should be fully discussed and explained. To ensure that the enumerators can translate and administer the questions, they should be asked to translate the questions into the local dialects and administer the questions in a practice session, and then back-translate into English or whatever

was the original language of the schedule. In this way, possible distortions and necessary modifications in choice of words can be identified.

The field part of the training can involve a pilot survey in which the questionnaire is pre-tested. If it can be arranged, more than the required number of enumerators should be selected for training, on the understanding that those who go to the field will be selected on the basis of their training performance. This is most applicable in areas where there are many potential enumerators.

Enumerators should be paid for each day in training for as long as they satisfy the training requirements. This arrangement makes for easier termination of any enumerators who fail to measure up to the standard.

For the one-shot type of survey, it is often rewarding to spend relatively more time in training than in actual data collection. For the longitudinal type of survey, training should continue even after the enumerators are in the field. Time is saved at a later point if their on-the-job training is maintained throughout the first two months in the field.

Training should involve both the enumerators and the supervisors together.

(From the Beirut seminar working group reports)

Interviewers Must Understand the Study

It is important that interviewers be knowledgeable about the task they are asked to perform. The quality of the survey data increases with the quality of the training given to interviewers. This training should include not only teaching them how to conduct the survey, but also what the survey is about. Whenever feasible, interviewers should be asked to participate in all stages of survey organization. This gives them the sense of belonging to a team.

Salem Gafsi, IBRD (Tunisia)

CONTENT OF THE TRAINING PROGRAM

In Nigeria and Kenya we spent some two weeks on interviewer training. We dealt with the objectives of the study (benefit to the nation), methods to be used, methods of data analysis (so that interviewers knew their roles and the consequences of their actions), interviewing and recording skills (role-playing as interviewers and interviewees), mock recording of responses and discussion of results, the role of the interviewer in the research process and interviewee morale (inviting important locals to explain their support of the study, etc.), village entry, and conduct in the field. Important also is to discuss the data collection strategy, the type of supervision, penalties for cheating, etc. Very clear expectation of working conditions should be established during training.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

For our studies, it would appear that the initial training of enumerators should occupy about two weeks, be heavily field oriented, and include:

1. Objectives and programs of the agency sponsoring the study;
2. Objectives and conduct of the survey;
3. Enumerators' terms of appointment and the chain of supervision;
4. Enumeration techniques (e.g., the use of closed, open-ended, probing questioning techniques);
5. Familiarity with and the filling in of questionnaires;
6. Training in plot and yield measurements;
7. Analysis of cropping patterns; and
8. Collection of market price and weight information.

At the start of the training period, each of our trainees is issued an enumerator's manual as a reference source, a bicycle, and rain boots.

John Flinn, IITA (Nigeria)

Train in Classroom and in the Field

Our enumerators were trained in two stages. The first week they heard talks on the objectives of the study, the problems of the rural areas and the uses to which the data collected could be put. They also considered the art of interviewing farmers and the approaches to use to establish rapport. Interviewers were introduced to the situational questionnaire, which was explained in detail. To ensure that they could translate and administer the questions, they were asked to translate them in practice sessions in the classroom. A lot of distortions or misinterpretation in the questions were prevented by such rigorous pretesting exercises.

The enumerators were then sent to the field to administer the situational questionnaire for a period of one month. They were also requested to write a report on the villages, the farmers and their activities, and the problems they faced during the situational survey exercise. These were taken into account in planning the second phase of data collection.

Field training, both theoretical and practical, was then resumed for about ten days at the Kwara State Farm Institute at Illorin. The first two days were spent in reviewing the enumerators' problems and experiences during the situational survey. Thereafter, the reference manual was explained in great detail. Practical exercises were given on the measurement of fields and of output of various kinds, etc. The instructors of the Kwara State Farm Institute and the AAs/FOs seconded to the project were of considerable assistance in the practical exercises.

O. Ogunfowora, University of Ibadan (Nigeria)

Training Trainers of Interviewers

Careful and thorough training of the enumerators constitutes the single most important aspect in the operation of our surveys. In the first stage of training, formal lectures have been given by the members of the Technical Com-

mittee of this survey to State Institute of Statistics (SIS) personnel. In the second stage, these SIS personnel in turn have trained primary school teachers in each province. A booklet of instructions was prepared and distributed.

Omer Gucelioglu, State Institute of Statistics (Turkey)

AIMS AND FUNCTIONS OF FIELD SUPERVISION

The supervisor needs to be a person professionally committed to the research project. He should concentrate on checking to make sure that:

1. Enumerators are at their place of work.
2. Forms are filled out correctly and truthfully.
3. Missing or misunderstood data are detected and corrected.
4. Relationships with the villagers continue to be good.

For a longitudinal survey the supervisors and researcher should be heavily involved in field data collection for the first couple of months. Thereafter regular supervisory visits will be required, but their frequency will depend on the number of enumerators, their geographical location, etc.

For a one-shot survey the supervisor normally will move with the enumerators, checking and perhaps coding the data. There are numerous advantages to having the coding done in the field but not by the person who has collected the data.

(From the Beirut seminar working group reports)

Considerations in Planning for Supervision

Supervision of interviewers is important in insuring that all the information requested on the questionnaire is collected and that the researcher has guidance to help him evaluate its quality.

We have found that a two-member interviewing team requires less supervisory attention, especially when its members regularly go through each other's completed

questionnaires at the end of each interview to check for omissions, review the logical acceptability of the magnitudes reported, and verify any dubious answers. Beyond this self supervision, each survey team should be responsible to a field supervisor, preferably one of the interviewers. Field supervisors should be chosen on the basis of their familiarity with the problem being studied and the area in which the study takes place. This enables them to handle problems that arise about the nature of the data collected and deal with particular local circumstances.

The ultimate supervisory responsibility, of course, must be borne by the research worker, who should stay in close contact with the surveying team during all phases of the survey work. This greatly helps the researcher in knowing the exact content of the responses reported and the problems, if any, associated with them.

Salem Gafsi, IBRD (Tunisia)

TWO WAYS TO COMBAT CHEATING, UNRELIABILITY

There are two solutions to problems of "cheating" and unreliability due to negligence of enumerators and inadequate field supervision. One is to provide adequate and continual field supervision. The other is to develop the research project in conjunction with the personnel who will eventually be the field enumerators, defining with them the objectives and the research design; creating the questionnaire, where one is used, and pre-testing it; working in the field; and jointly coding and analyzing results.

If enumerators are, in fact, "co-researchers" involved in all of these tasks, they have a clearer idea of the meaning of the whole exercise and obviously feel a greater sense of involvement. This implies, however, that the "original researcher" must actually welcome full participation, and not make a pretense in order to increase labor productivity. Ultimately, the whole exercise of research needs to take place *with the people whose reality is being investigated;*

i.e., peasants and researchers together investigating problems and seeking their solution.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

Research Workers Must Help with Supervision

However well trained enumerators are, they make mistakes in the early stages of field work. We lost about two months of data in some areas in our farm level study because personnel shortages and logistic problems made it impossible to supervise enumerators closely in the early stages.

For effective control of field work, researchers themselves should take active part in field supervision, especially in the early stages. This keeps the researcher in touch with field problems, especially those due to faulty questionnaire design. Our field supervisors are stationed and operate out of project headquarters for the same reason. Such an arrangement may, of course, not be possible where the project covers a very large geographical area. Njala is a maximum of 200 miles from our farthest sample area.

While in an enumeration area, supervisors sometimes conduct a few spot interviews as a check on what the enumerator has recorded. To make this possible we hire supervisors who speak local languages.

Dunstan S. C. Spencer, University of Sierra Leone

Adequate Research Direction Demands Physical Presence

We have never been able to afford the luxury of hiring full-time supervisors, but this is not something I have regretted. In the uncertain state of the arts with reference to collecting data in the developing world, it is absolutely essential for the research worker himself to be involved in all stages of field work, not just at the beginning of the project. Being able to hire supervisors is essential if the project is a large one, but does not relieve the research

worker of the need to visit the field frequently and regularly.

During the early years of our research program we decided that because of the distances, poor communications and the necessity of very close supervision of the data collection, the research worker should live in the survey area (i.e., consisting of two or three sample villages) for the whole survey year, returning to Zaria for a few days each month. While he was in the survey area he was provided with a house, landrover or minimoke, and other logistic support.

Although this approach is expensive it was considered essential during these early years when, due to a lack of experience, many of the problems could not be predicted.

With the availability now of more experienced enumerators, attempts are being made for the research worker to be stationed in Zaria on the understanding that visits will be made to the survey area on a weekly or two-weekly basis. The frequency of visits depends on the distance of the survey area from the Zaria area.

David Norman, Ahmadu Bello University (Nigeria)

Other Qualities More Important Than "Contacts"

From our experience the worst kind of group leaders are the "pensioners." In the past, some of our colleagues used to believe that such people, who had long experience in the government service, could make the work much smoother through their personal contacts. Often they prove, instead, to be quite useless and very difficult to handle. Field work requires activeness and mobility on the part of a group leader who is still energetic and willing to work hard. There is no point in designating as field leaders or supervisors people who, in spite of all the transportation facilities available to them, hardly move out of their home towns.

A. M. El Hadari, University of Khartoum (Sudan)

Strategic Placement of Field Supervisors

We have found value in stationing several field supervisors together in a location that is central to a number of enumerator areas; they like the company, and an element of randomness can be introduced into supervisory visits. Days are nominated for a supervisor to visit each group of enumerators, and all members of that group await his arrival. He then chooses one to accompany on visits to farms.

It is also often of value for the supervisor and enumerator to go back, with the completed questionnaire, to farms covered by the enumerator the previous day.

A particularly important check with enumerators who are doing cost-route or "frequent visit" surveys is to ensure that enumerators quickly pick up any new fields being brought into cultivation.

Supervisors should share the same kind of field conditions as their enumerators; it is good for morale and a good way to judge if living arrangements are adequate.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

Twice-Monthly Supervisory Visits Desirable

Our field enumerators receive both regular and surprise visits from the field supervisor or project leader in order to review and cross-check. During these visits, instructions are given and any problems which may have arisen are handled. In our opinion, at least one visit every two weeks should be made to the enumerators. They can be paid their salary on that occasion and supplied with necessary survey materials.

Eric Tollens, National University of Zaire

GIVING THE ENUMERATOR MATERIAL SUPPORT

Provision must be made for all of the facilities enumerators will need for efficient performance of their

work. For example, it may be necessary to provide them with loans for the purchase of a motor bicycle (where facilities for repairs and maintenance exist), bicycle, mule, donkey, canoe in riverine areas, or other necessary transport. Some enumerators need rainboots, raincoats, or other equipment. Allowances should be given for the repairs and maintenance of motorcycles or bicycles.

The regular visits of supervisors can be the channel for payment of per diem allowances for accommodation and/or transport. There seems to be a consensus that advance payment of per diems is undesirable, but it is also recognized as sometimes unavoidable if the research is to go forward.

For short-term projects there may be justification for cash payments to interviewers in lieu of earned leave.

It may be necessary to use some disciplinary measures to reduce discontinuity in data collection arising from loss of enumerators or bad work performance. Measures that have been successfully used include:

- a. Withholding part of the enumerator's salary to compel him to stay on the job and/or to serve as security for the bicycles and survey equipment. It is often advisable to pay these withheld amounts at the end of the survey year.
- b. Making payment of enumerators' salaries contingent upon satisfactory performance of work.

Self-discipline is more likely to be effective among survey research personnel if they have been given an opportunity to participate in such activities as research design and instruments construction. This is especially true for research assistants.

(From the Beirut seminar working group reports)

MANY FACTORS INFLUENCE INTERVIEWER MORALE

In our studies the research worker visits each enumerator at least once a week to resolve any problems,

check interviews and collect completed interview forms.

It is important to stress the necessity of frequent checking of the interview forms throughout the survey year. This practice tended to boost the morale of the enumerators by indicating interest in the results of their work and ensured, as far as possible, that data were not being concocted by the enumerators without visiting the farmers.

A number of details contributed to maintaining the morale of our enumerators. For example, at least two enumerators were stationed in each village for the whole survey year, to provide companionship. In addition, suitable housing was located for the enumerators at the beginning of the study and a small duty allowance over and above their normal salary was paid in recognition of their relative isolation from the amenities at Ahmadu Bello University. Also we paid any transport costs involved in enumerators or their dependents visiting dispensaries for medical treatment. In some areas there were no schools but care was taken to try, whenever possible, for enumerators with school age children to be located in villages with schools. Finally whenever possible, depending on the salary level of the enumerator, bicycle loans were given to enable them to purchase their own bicycles. A small monthly bicycle allowance was also given, since bicycles greatly increased the efficiency of the enumerators. Initially bicycles were made available for use by the enumerators. However, this proved to be unsatisfactory since, because they were not privately owned, less care was taken of them.

One innovation that we are now implementing—suggested, I believe by Niels Röling—is the circulating of a newsletter to all enumerators regularly. Where enumerators are in isolated locations, a simple publication that reports activities of the staff and the progress of the study should help substantially in raising their morale and making them feel part of the team.

David Norman, Ahmadu Bello University (Nigeria)

Form of Payment Affects Interview Quality

Judging from my observations one should never pay interviewers on the basis of how many questionnaires they fill out. This tends to encourage some interviewers to substitute quantity for quality. But payment by the day, combined with long working days, has also proven to be disastrous to quality, especially that of the interviews conducted at the end of the day.

Salem Gafsi, IBRD (Tunisia)

Some Estimates of Interviewer Work Load

In IITA's intensive land utilization surveys two enumerators are placed in each village. With a planned sample size of 25 to 30 farmers per village, enumerators make twice-weekly visits to each respondent; this, given their other responsibilities, is about all that can be handled.

John Flinn, IITA (Nigeria)

In the cost-route survey of rice production in Zaire, where hours of labor input are recorded, an average of fifteen farmers per field enumerator is found to be appropriate. Each enumerator has a bicycle at his disposal. Enumerator travel time is reduced by using an area sample, and each enumerator is stationed in the village in which he has to interview.

Farmers are interviewed twice a week, mostly in late afternoon or in the evening because farmers are at work in the morning and do not like to be disturbed. The enumerator visits each farmer on Monday or Tuesday evenings and on Thursday or Friday evenings. The mornings and all of Wednesday are used for field measurements and for coding the questionnaires.

Eric Tollens, National University of Zaire

Rigid Work Schedule Is Not Practical

As farmers are generally not available during regular working hours, enumerators are not expected to work at specific times and no track is kept of the actual hours worked. Our enumerators are expected to interview farmers at times most convenient to the latter (i.e., usually early morning or in the evenings). No overtime is paid and the criterion for satisfactory performance is that the interviewing was undertaken and that the forms are correct.

David Norman, Ahmadu Belio University (Nigeria)

Travel Time Eats Into Interviewing Hours

Six hours of interviewing time is the most we have felt we could expect from an interviewer each day. This should be decreased slightly if the terrain of the area surveyed requires extra physical effort on the part of interviewers. It can be slightly increased in case of team interviewing, as a result of the higher morale that usually prevails when two or more interviewers work together.

Actual interviewing time can also be increased by locating interviewers as near as possible to the survey area, which would give them a fresh, early start each morning. This has, of course, its price, namely, the interviewers' food and lodging bill.

Salem Gafsi, IBRD (Tunisia)

TWO WAYS TO HANDLE LOGISTICS OF INTERVIEWING

In Kenya we used the "immersion" technique, whereby interviewers stay in one place (relatively close to their homes) and need only to be transported to the daily place of work by a car, in this case a government landrover assigned to the team. The team stayed in the Farmers Training Center from which lunches were taken. Screening of completed questionnaires was done by the researcher in the evening or early morning, so that omissions

or unclear answers could be corrected the next day by revisit.

In Nigeria, we used another technique. Our team of interviewers worked scattered over a large number of villages (first in pairs, later individually). Each stayed for about two weeks in each village where he interviewed. With this method the problems of logistics were enormous: interviewers had to find a place to stay in each village, carry a campbed, make arrangements for food, etc., while the researchers drove thousands of miles to screen questionnaires before the interviewers left, to bring them their mail and salaries, and to solve other problems.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Schools May Offer Low Cost Lodging

In Tunisia, many agricultural schools have shown willingness to accommodate interviewers, especially if they are students, at a nominal fee during the survey period. During the last survey I participated in, four of us spent the nights and had dinners at an agricultural high school for two weeks. The total bill was around \$50.

Salem Gafsi, IBRD (Tunisia)

IX. INTERVIEWING TECHNIQUES AND PROBLEMS

LOCATING SURVEY RESPONDENTS

The first problem one encounters when interviewing begins is that of locating the respondents. In Tunisia, the local administrator or Cheikh has proven to be a reliable source of advice. In many instances Cheikhs offered their personal assistance in locating respondents.

The contribution of the Cheikhs is greatest when it is limited to providing advice as to people in the area who can help locate respondents and serve as field guides. Results are not so satisfactory if Cheikhs accompany the interviewers. In that case:

1. Cheikhs often end up using the interview time to take care of their own administrative problems.
2. Farmers tend to concentrate on bringing up their grievances to the Cheikh rather than on answering the questions they are asked.
3. Many Cheikhs take part in the interview by answering questions for the persons being interviewed or questioning the answers they provided.

Field guides provide more services than merely locating respondents. Their knowledge of the condition of the roads (usually dirt roads) has proven to be a critical factor in determining whether interviewers ended up interviewing farmers or interviewing themselves on how to get their car out of the mud.

In the technology adoption study in Tunisia, we were sometimes discouraged from field interviews in a few areas

because of road conditions. In those instances we asked the Cheikh to issue written invitations to farmers in those locations to gather at a specific time and place.

Good working conditions include trouble-free means of transportation to allow interviewers to concentrate on their work. The question of whether to hire chauffeurs for the vehicles used in the survey has always been an issue in Tunisia, especially when it comes to using government cars. My own experience taught me that chauffeurs end up being a burden in interviews. Hiring them is justified only if interviewers cannot drive and/or if a chauffeur is very familiar with the area surveyed and can serve simultaneously as a guide in locating respondents.

Salem Gafsi, IBRD, (Tunisia)

Be Prepared to Yield to the Weather

Travel between the towns and villages involved in this survey was usually accomplished by jeep, although some villages were so far from the road that they had to be visited by horseback or on foot. Especially in winter the climate was another problem in reaching the villages. Some villages could not be visited in the winter; fortunately, these villages were few and were visited another time.

Omer Gucelioglu, State Institute of Statistics (Turkey)

CRITERIA FOR DETERMINING HEAD OF HOUSEHOLD

If one's unit of analysis is the farm-family head, there remains the problem of determining who that head is. In Africa, the putative head frequently resides elsewhere, either working at a regular job or managing a farm many miles away on a settlement scheme. My rule is to ascertain which member currently resident on a selected farm is responsible for making day-to-day managerial decisions about the problem I am investigating.

Joseph Ascroft, University of Iowa (East Africa)

FAMILY COMPOSITION NOT EASILY ESTABLISHED

The primary sampling unit in a farm management and production economics survey is usually the farm family or household unit. How is this unit defined in the African context, where the family concept is quite different than in Western culture? Usually, it is very easy to identify the head of the family, but it is sometimes quite difficult to determine the size of the family because of the extended family system.

In Zaire, the consumption unit is often larger than the production unit. An extended family may eat together but not necessarily work together on the same field. Often felling trees, clearing forest, burning, etc., is done by the extended family on a large piece of forest, but planting, weeding, and harvesting is done by smaller family units on individual plots within the large field that was claimed from the forest. Married sons or daughters usually stay for some time with their spouse at the compound of the family head. They often eat together but have their own fields.

The mutual exchange of labor without payment in cash or kind is quite common in Zaire. Most farmers have to perform certain tasks on the field of the village chief. In addition, there is usually a communal field where all members of the community share work tasks. This is often on a fixed day, mostly on Saturdays.

In the final analysis, the definition of the family unit for farm management and production economics research has to center on the definition of the production unit: people who work together on a particular field or fields for the length of the crop season and who distribute the proceeds from the field among themselves. Each household head should be interviewed at the beginning of the survey to record family linkages and to determine what unit in the household corresponds to a production unit.

Eric Tollens, National University of Zaire

Multi-Household Compounds Pose a Problem

A demographic survey was undertaken at the beginning of the study in order to delineate families. A family or household was defined as "those people eating from one pot." This definition was chosen as it was the closest approximation that could be found for a work and consumption unit (i.e., a group who usually work and eat together). These families may be simple units (*iyali*) or composite units (*gandaye*). A compound often had more than one family or household, and consequently was identified as 23(1), 23(2), etc., (i.e., households 1 and 2 in compound 23).

David Norman, Ahmadu Bello University (Nigeria)

Male-Female Work Roles Affect Data Collection

In Kenya, where the unit of analysis was the farm when it came to innovation, credit use, and such variables, we encountered some problems due to the fact that there is a division of labor between sexes, so that information about loans, for instance, was only obtainable from the men, while information about food crops could be obtained from women. This was especially troublesome in cases where the man worked in town and the woman was left in charge of the farm.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

HOUSEHOLD HEAD MAY NOT KNOW ALL THE ANSWERS

When the household head is interviewed on behalf of the household as a whole, inaccurate, incomplete or missing data can result:

1. Household heads may not be used to thinking in the terms in which question was posed (e.g., age of family members).
2. Because of custom or some other reason, household

heads may not feel free to talk about certain subjects (e.g., mention the names of their first wives and/or first children).

3. Household heads may not be aware of all the family activities on a given date, and so cannot be expected to give a full account of the household economy and activities. In general they have such information, but there are exceptions. For example:
 - a. The household head may not have information about the time spent on or the yield of fields under the jurisdiction of other household members. To obtain accurate records of labor allocation and to detect missing information about individuals, each household member must be given a code number to identify his or her work activities. If labor data are also collected by field, it will then be obvious that data are being omitted if no activities are recorded on particular fields.
 - b. Sometimes the household head does not know the income earning activities of women in the household, as any such money earned is often kept by them. For example, when preparing cooked foods for sale, women often buy the raw materials from the household head, prepare the food and get children to sell it outside the compound. Time spent by women on these activities and on shelling and threshing the crops is also unlikely to be known by the household head. Also, there may be no way of ensuring that women's activities are well documented if the practice of seclusion of women precludes male enumerators from interviewing women.

In some situations the enumerator can elicit data from another family member which the farmer would himself be unwilling to divulge. For example, taboos of various sorts may make him unwilling to tell the age of his eldest child or the name of his first wife, yet he will have no objection to someone else supplying that information. This is admit-

tedly a special case, but of a kind to which enumerators should be alert and responsive.

David Norman, Ahmadu Bello University (Nigeria)

Rapport with Whole Household Is Needed

In our field work in Sierra Leone we often encountered occasions on which the head of the household was temporarily absent; this caused some difficulty in getting information on household activities. The solution to this problem appears to be the establishment of good rapport between the enumerator and the complete household, so that when the respondent is away (or even while present) the other members of the household can be interviewed or can pass the information to the head so that he is fully informed and is able to relay it to the enumerator when he makes the necessary call-backs. Most of our enumerators have established the necessary rapport.

Dunstan S. C. Spencer, University of Sierra Leone

INTERVIEWERS CAN HELP TO SPOT DISCREPANCIES

I have had questionnaires completed in rainfed hill areas of Tunisia which reported an improbably yield of 26 quintals per hectare for local durum wheat varieties using no fertilizer. I have also had questionnaires reporting that some small farmers have paid out in kind more in wages than their total crop output. Interviewers could have caught such discrepancies during the interview and could have tried to correct them without affronting the respondent.

One useful way of discreetly correcting such discrepancies is to have in the questionnaires some built-in checks for the entities most likely to be overestimated or underestimated. I have also encouraged interviewers at the end of the interview to put again to the respondent, using the same or modified wording, any questions they felt had produced doubtful answers.

In a production interview, one should be aware of the

technological possibilities of the area in order to appraise critically the answers generated by the questionnaire and ask for additional information in case they sound out of line. In this respect I have made it a rule to provide interviewers with local and regional norms for the entities they are recording information about. This makes them better aware of obvious overestimations or underestimations.

Salem Gafsi, IBRD (Tunisia)

WHICH ARE THE "SENSITIVE" TOPICS?

In the Sudan we have found that rural people usually respond quite freely on such subjects as age and education (except in the case of family size and distribution by sexes). Our interviewees never like to talk about the female side of their families, and they feel very embarrassed when asked about the number of girls they have, their ages, etc. In some instances, they may not give the correct family size, being afraid of the "evil eye."

Costs of agricultural operations are likely to be inflated to indicate that there is very little profit in farming. (Some farmers may even include many agricultural operations which they never perform.)

In our surveys, the lowest response was to questions about livestock. Farmers *never* give the actual numbers of their animals. They are afraid of the "evil eye" and they are also afraid of taxes, since they have to pay a certain tax for every animal, the amount depending on the type of animal.

A. M. El Hadari, University of Khartoum (Sudan)

RELUCTANCE TO RESPOND OFTEN OVERESTIMATED

If the type of data required is sensitive, good rapport between the respondent and interviewer is very important. Trust in the discreetness and goodwill of the organization collecting these data is also important.

Farmers are, for example, sometimes reluctant to disclose all crop sales. Presumably this reflects their unwillingness to permit others to know about their liquidity position.

Data on livestock, especially cattle, have been difficult to collect because people owning cattle in Nigeria are subject to a cattle tax (*jangali*). Some information on cattle could be collected at the end of the survey year, when a good relationship had been firmly established between respondents and interviewers.

Finally, data on such subjects as loans and debts were not collected for fear of jeopardizing the whole study and because of doubts about the reliability of answers. (Such data were, however, collected relatively easily in later studies in the Zaria area using the same farmers. In actual fact they are now being collected in a survey in Kano state where farmers have never been interviewed before. Perhaps we were unnecessarily conservative in our earlier studies!)

David Norman, Ahmadu Bello University (Nigeria)

Admit It When Asking Sensitive Questions

The purpose and scope of sensitive questions should be made quite clear to the respondent. A letter of recommendation from well known local or regional authorities may help assure cooperation, but some subjects are too personal and answers too likely to be unreliable. Examples are information which will help determine the farmer's net worth such as data on loans, debts and cash savings and the number of suits, shirts, shoes, etc. Also, it is obviously unwise to seek information on the possession of guns or other illegal weapons and information about illegal activities such as distilling alcohol or hunting protected animals.

Eric Tollens, National University of Zaire

The Art of Interpreting Answers

Responses differ in their verbosity, leading to difficul-

ties in interpreting and comparing answers. Moreover, responses which may appear to be irrelevant to the purpose of the question itself are in fact buildups to the real answer which comes at the very end. If probing is not satisfactory, "the end" may not be reached.

Another problem is that different people may respond to different aspects of the same question. Any question has potentially diverse meanings (open-ended more so), and it is impossible and incorrect for the enumerator to standardize the intended meaning for the respondents. What happens therefore is that different answers fit different dimensions of a problem or issue, but not all of the possible dimensions. Thus even when there is inadequate information for any one respondent, by pooling all respondents' answers it may be possible to perceive all the *potential* dimensions of a problem for any one individual.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

Interviewing Situation May Introduce Bias

The reliability of information collected depends greatly on the relationship between the interviewer and the respondent. When male respondents in a family planning survey in rural Kenya were interviewed by female interviewers they tended to report that they were young, rich, single, and believers in family planning. When the same male respondents were casually interviewed by male interviewers, a number of them expressed hostile opinions about family planning, revealed that they were married with a large number of children, and disclaimed the wealth they previously had reported to the female interviewers!

Shawki Barghouti, Arid Lands Agr. Development Program (East Africa, Jordan)

Sources of Bias in Response

Courtesy bias seems especially a problem when asking for opinions; for this reason we avoided opinion statements in Kenya. Bias is also introduced when the respondent

expects that the interviewer can turn on the taps of Government finance.

One problem we paid great attention to in Nigeria was privacy. We felt the respondent might be biased by social control if half the village was present at the interview. We solved this problem by making an appointment with the respondent and asking him at that time to make sure that the interview could be held in private, after explaining the reasons for it. This method proved very effective. In Kenya, privacy was not so much of a problem, because farm houses tended to be scattered across the countryside in the area where we worked. Also, interviewing was not such an event in that place.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Private Interviews Avoid Some Problems

When farmers are allowed to sit together they give more or less the same answers to all the questions. The farmer is not left to say what is in his mind, but words are put in his mouth by others. At every question the farmers start to argue among themselves, and thus a considerable amount of time is wasted. For this reason, we try to interview each farmer separately.

A. M. El Hadari, University of Khartoum (Sudan)

The Farmer's Field: Good Site for Some Interviews

The interviewer can collect data right on the field, as the farmer performs his operations, or in the residence of the farmer later in the day. Field visits promote accuracy by ensuring that the enumerator becomes conversant with the operations going on in the fields and also enabling him to identify each field and establish a good working relationship with the farmer. However, since it is usually technically and economically impossible to provide enough interviewers to visit individual farmers in their fields each day, we use a combination of farm and residential visits. A visit

three times a week to each farmer reduces the margin of error resulting from heavy reliance on memory recall.

O. Ogunfowora, University of Ibadan (Nigeria)

SOME SURVEYS MUST BE TIMED TO CROP SEASONS

Timing is important whenever the objectives of the study and therefore the survey schedule are tied to the growing season of major crops. Careful planning is necessary if the survey is to be matched with the growing season.

Eric Tollens, National University of Zaire

INTERVIEWING IS EASIER IN SLACK SEASONS

From our experience we now know that farmers are not willing to spend enough time with the field interviewers during the critical periods of the cropping season, while they are willing to spend long hours with the interviewers in the slack season.

A. M. El Hadari, University of Khartoum (Sudan)

It is preferable that the baseline survey be completed and the sample of farmers drawn prior to the start of the wet season, when the demands on the farmer's time begin to become heavier. Where a complete year's information on a farming system is required, it is of course vital that the data collection phase start before farming activities commence, towards the end of the dry season.

John Flinn, IITA (Nigeria)

Weather Affects Farmer's Responsiveness

One source of discontinuity in recording can be the occurrence of natural hazards. For example, the drought which affected the northern parts of the country in 1973-74 also extended into Kwara State. Yields were depressed in some villages, particularly in an area where the farmers depend largely, and in some cases solely, on their rice

fields in Duku Rice Irrigation Scheme. Most of these farmers obtained no rice harvest that year, and this calamity affected their readiness to cooperate with the field assistants. General apathy and poor response continued into the following year, when the rains were late. When the rains finally came they were irregular, and the farmers' response fluctuated with the rains. They were eager and friendly after a rainy day but withdrawn and apathetic after a dry spell. This continued until the rains became regular.

O. Ogunfowora, University of Ibadan (Nigeria)

TWO-HOUR INTERVIEW EXHAUSTS PATIENCE

My initial survey questionnaire in the cotton study required an average of more than two hours of interviewing. This is too much to expect from the farmer. He rapidly gets annoyed with the exercise. Interviewing should take a maximum of an hour; otherwise fatigue sets in and farmer cooperation slips away. When the questionnaire could not be completed in a one hour session, several sessions on different days were held. This solution proved satisfactory.

In the rice study, farmers were visited twice a week, and some farmers expressed annoyance at such frequent visits. Some demanded compensation for their information (cigarettes, beer, farm tools, salt, clothing, etc.), but the enumerators were usually successful in persuading the respondents to cooperate.

Eric Tollens, National University of Zaire

SUBSAMPLES CAN REDUCE INTERVIEW FATIGUE

Long questionnaires, by causing interviewer and respondent fatigue, lead to non-response. We have generally tried to limit our interview time to a maximum of thirty minutes, preferring to conduct several short interviews over a period of time rather than one long interview.

There are various ways of staggering questionnaires for information that does not vary too much. For example, in a consumption study we interview a different subsample of

the rural households each week of the month. (This approach is, of course, only possible when the multiple visit technique is used.)

The advantage of using short questionnaires was brought home to us early in the rice production study. We attempted to collect data on the credit and savings operations of rice farmers using a structured but very long questionnaire requiring about two hours to complete. Only two of our nine enumerators were able to complete their assignments. The questionnaire was later broken down into four shorter ones which were then successfully administered on four separate occasions.

Dunstan S. C. Spencer, University of Sierra Leone

Interviewing Teams Offer Advantages

Third party interference in the interview has been avoided by team interviews in which four of us go to the spot, three for interviewing and one to "entertain" farmers who are waiting their turn or who are there simply to satisfy their curiosity.

The idea of multi-member interview teams was used throughout the second survey of our technology adoption study in Tunisia. Three agricultural technicians participated with me in this survey. The first two days we interviewed as a team. I asked the questions and I gave the other members the opportunity to comment on the questions in case farmers showed signs of misunderstanding. After these two days of training we split into two-member teams.

Originally, I chose this work plan with the hope that I could make the survey a learning experience for as many people in the wheat program as possible. It is hard to tell whether that was achieved. I know, however, that the procedure has insured that the work is done with enthusiasm and has allowed me to get a good idea as to the quality of the data from listening to the team members comment about their shared experiences at the end of each working day.

The two-member team has been particularly helpful in making the logistic problems bearable, in the sense that none of us would have been in a mood to conduct good interviews after several hours of wrestling a car through mud paths. This consideration easily compensates for the time component involved in having two persons do the interview jointly.

The value is even more apparent when one considers the effect of two-member teams on the number of omissions in the completed schedules. In the first adoption survey, with one-man interviewing, 25 questionnaires had to be discarded because interviewers failed to record key information and three questions had to be dropped from the remaining schedules because of repeated omissions in the answers.

Salem Gafsi, IBRD (Tunisia)

FIELD OBSERVATIONS IMPROVE THE STUDY

In many rural surveys, there is considerable value in the observational notes of the field workers. Researchers should be able to comment on their respondents and what goes on around them. These can be compiled in a notebook or in a diary form. Usually it is better to have these comments/observational notes compiled when one is away from the subject. Observation is a craft and can be very diverse in its objectives and should therefore be controlled or directed. A manual of instructions will help field workers see what to observe and how to record the observed data.

In farm management surveys, researchers or interviewers should write observational reports either in the middle or at the end of the project. These are a very valuable addition to whatever data are obtained through questioning or direct measurements.

As a pre-requisite for successful observation the researcher must first obtain the co-operation of the people. To avoid being regarded as an outsider, or in order to gain

the confidence of the people, it is advisable for researchers to live in rural areas where the observation is carried out. The observer should note that he is also being observed. He should therefore find out whether his role in the community is perceived as positive or negative, and determine the possible relationship between the role allocated to him and the nature of social interaction between himself and the local people. He should always try to cultivate a positive image. He should also avoid wild promises and be frank about what he is doing.

(From the Beirut seminar working group reports)

Supplementary Notes Help Interpret Schedules

I have used field diaries as a standard procedure in my interviewing. I tried once to keep a diary separate from the questionnaires. I have found, however, that notes and special remarks are more useful when put on the questionnaire itself. This can be easily achieved by adding a blank sheet at the end of the questionnaire. The notes accumulated in this fashion are of great help in the analysis stage when results do not conform with theoretical expectations. For this reason, interviewers are encouraged to put in writing any information reflecting on the problem which they think will help the researcher better understand the particular circumstances of the respondent.

Supplemental information from the field can lead to a reformulation and/or addition of certain questions. This is another reason why the researcher should keep up with the flow of such information.

In a well-planned study there will be no occasion to change the questionnaire with each new insight from the field. What is important is to watch for those which represent a departure from what was expected, usually in a particular locality or with a particular group of respondents. It is then that the researcher must change or add to the questionnaire to catch the circumstances that caused the departure from the normally expected behavior.

This may involve second visits to some respondents. The

added step is usually well worth taking when one considers the amount of precision it can add to the results and the amount of guessing it can save at the analysis stage.

Salem Gafsi, IBRD (Tunisia)

Information Flow Can Be Two-Way

A major concern of the scientists cooperating in our field surveys is that the information flow during the course of the project not be unidirectional, from the farmer to the survey team. For these reasons, where distances permit, the chief, councillors or leaders of the farmer organizations in the villages selected for detailed surveys are invited to visit the Institute's research station at the project's expense. This visit not only shows farmers the potential of some of the selected technology being developed, but helps to make the villagers more familiar with the aims of the project and how the information obtained in the survey will assist in the overall effort of the research program.

In addition, the scientists offer to locate one or two experimental sites in each village. At one site a series of mini-kits with a limited number of food crops (usually three or four) of interest to the village is established. At the other site a simple experiment is conducted to compare and demonstrate the economics of improved practices—where they exist—with the farmers' methods.

John Flinn, IITA (Nigeria)

Enumerators Find Reference Manual Useful

Enumerators should have a reasonable workload with detailed and clear instructions about how various tasks should be executed. We have also found it essential to provide them with a reference manual in which the survey methods and instruments are explained in detail. The manual should also contain a daily calendar of activities to be performed or questionnaires to be completed.

Dunstan S. C. Spencer, University of Sierra Leone

For the Kwara State study, we found it useful to prepare a reference manual which contained all the interview forms to be completed during the production year. These forms are modified from time to time to incorporate new ideas as well as remove irrelevant ones.

The enumerators are encouraged to study the reference manual very closely and use it as their "bible." They are encouraged to edit their schedules promptly after each day's interviews, while recall is still at its maximum. They are also instructed to enter the data directly into the interview form so as to reduce the possibility of error during data copying.

O. Ogunfowora, University of Ibadan (Nigeria)

"Event Manual" Aids Respondent Recall

Interviewers need to have with them a manual which lists important dates, events, festivals, years certain crops or ideas were introduced, etc. This can be compiled with the aid of such departments as:

1. Census Office, which has one for census activities;
2. National archives;
3. District or local administrative offices;
4. Some government departments such as the Ministries of Health, Agriculture, Community and Social Welfare, etc.;
5. National museums;
6. Existing records in libraries.

Most appropriately, this material can be gathered at the beginning of the project or during the reconnaissance survey.

Such a manual definitely aids recall in rural areas where there are no records of any sort, and where some of us consequently do not know our own birth dates.

John S. Nabila, University of Ghana

X. WINNING COOPERATION OF RESPONDENTS

LOCAL FUNCTIONARIES CAN HELP AT CRUCIAL TIMES

Apart from the obvious need for respondent-enumerator rapport, there is an equal need for what can be called researcher-local functionary rapport. Before an enumerator is sent to an area we have found it necessary to contact district officers, paramount and other chiefs, and other local and central government functionaries to explain the nature and scope of our planned survey and solicit their support. This lays a foundation for the enumerator to be introduced personally to the chief and people of the area, and also establishes a direct line of communication between the local government functionaries and the researcher independent of the enumerator. One occasion which requires such a line of communication is the replacement of an inefficient enumerator who has nevertheless established good rapport with the respondents. All that is usually necessary is to introduce the new enumerator to the chief and elders ("I brought you Mr. X earlier, now I bring Mr. Y to replace him."). Without such a direct line of communication, we are convinced that it would often be impossible to continue work in an enumeration area where original enumerators had to be replaced. In one case an enumerator absconded from the area having committed a criminal offense. With the full support of the Paramount Chief, who was not resident in the sample area but had earlier given us his blessing, we were able to introduce another enumerator and continue

the survey despite the initial opposition of the local town chief.

In some traditional societies respondents will not cooperate with enumerators unless their chief is involved also. In that situation, to establish rapport with the community we have found it necessary to include the local village or section chief in the sample of respondents. His forms are left out at the time of analysis if he was not in the original sample.

We have not found it necessary to give any form of financial reward to cooperating farmers. Our problem has more often been in explaining to non-sampled farmers why they were not being interviewed, since it was usually regarded as prestigious to be selected for interview.

In the marketing component of the rural employment project, where more money-conscious respondents (traders) are being interviewed and their products weighed, we may need to give some incentives (e.g., a small cash payment). This was done in Freetown during the price collection exercise of the staple food crops marketing study, but may have been unnecessary.

Dunstan S. C. Spencer, University of Sierra Leone

Community Mood Affects Climate for Interviews

Contingent problems like the political situation at the time of the research or the mood of the village following a death or a wedding or a poor harvest are some of the factors that have to be taken into account. For example, a colleague had a difficult time in the field because a person had hanged himself in the area that had been included in the sample; the villagers were suspicious of any foreigner in case he was a detective, and the police were also suspicious of foreigners in the area. When can one be sure that the dust has settled? Yet a decision to move to another area is difficult if some work has already been done.

T. B. Kabwegyere, University of Nairobi (East Africa)

INCENTIVES ONLY IF REQUIRED BY TRADITION

I would not advise payment of incentives unless they are in accordance with the requirements of the tradition of the area. Incentives not only create a budget problem, they also result in "polished" responses, apparently for more or better incentives. However, individuals in villages or towns who devote considerable lengths of their time to helping you collect the necessary data should be rewarded accordingly.

Tradition in some areas requires some token gifts for the chief, earth-priest or the elders of the settlement. These gifts are usually indirectly meant for the land or earth god of the area. For example, in the Mampong Ashanti District, gin or whisky and a few coins were required for pouring libation to the gods and ancestors of the area before any information could be divulged. In some areas in the North, kola nuts and a few coins for the traditional heads are significant signs of the researcher's willingness to respect the customs of the people.

In a few instances where the data collection involves the oral tradition or history of the people the researcher might be required by custom to slaughter a fowl or a sheep or even a cow so that the elders can ask for permission from their ancestors or earth god before giving out the secrets of the people. A researcher interested in facts and the cooperation of the people will have to comply with these requirements.

John S. Nabila, University of Ghana

INCENTIVES HAD QUESTIONABLE VALUE

Farmers in the master sample in the North Central State study were given a promissory note at the end of each month entitling them to a reward of one half of a bag of fertilizer for that month's cooperation, to be delivered at the end of the survey year. The wisdom of such a reward can be questioned, since it created problems in obtaining data from the same farmers on subsequent studies. In the

studies undertaken in the other areas no such remuneration was promised or found to be necessary.

In some of the areas small gifts were given at the end of the survey year as a sign of appreciation, but not on a promissory basis (e.g., in one village some cement was given to build a mosque, in another buckets were issued, etc.).

I agree completely with John Nabila as to the importance of respecting local customs and traditions, and this may require token gifts from the enumerator to the respondent. Suitable small gifts (kola nuts, for example) cost very little, although institutional rigidities may make it impossible to claim expenses for them. We have used such gifts, paying the cost out of our own pockets.

In terms of a more concrete reward, I think there is a lot of justification for giving something to the community as a whole rather than to individuals. After all, the community spirit is still very strong in most of Africa. We have found that just insuring that fertilizer supplies or a credit program reach a village means a great deal to the villagers and also helps them adopt modern farming practices. Rewards of this kind are productive and cost the interviewing agency relatively little. The research worker's role is that of contacting the right ministries and individuals to encourage them to make sure that farmers of the area get the facilities they are entitled to. The bargaining position of the research worker with government is usually much stronger than that of the poor individual farmer, who can more easily be ignored.

David Norman, Ahmadu Bello University (Nigeria)

Material Rewards Build Expectations, Tensions

It is questionable whether material rewards should be offered to farmers in the survey. If they receive something for their cooperation, it easily leads to expectations for more and builds tensions with farmers who are not included in the survey.

Eric Tollens, National University of Zaire

Material Goods Not the Only Incentive

During the negotiation stage, it is necessary that the reward system for participating in the project be clearly established. Even when villagers understand that the only payment to the cooperating farmers will be a bag of fertilizer for those who cooperate throughout the project, there will be interest in discussing potential benefits to the village which *may* result from the survey through increased food production, developing better varieties, new farming practices, and making policy makers more aware of the farmers' problems.

John Flinn, IITA (Nigeria)

Limit Field Staff to Promises That Can Be Kept

A problem that arose from the farmers' expectation of assistance was that the field staff, faced with incessant demands coupled with dwindling enthusiasm, were generally prone to take the easy way out and promise one type of aid or another. Field assistants should be instructed not to promise loans or other benefits unless such benefits are an integral part of the project plan. Enumerators should be asked to emphasize only that the results of the research would be made available to the government and other agencies concerned with the granting of loans and other forms of aid to farmers.

O. Ogunfowora, University of Ibadan (Nigeria)

Respondents Appreciate Assurance of Anonymity

With all the talk of land reform even in Africa, one of the biggest fears of rural people is that their lands will be expropriated or taxed by government. We have therefore found it necessary to have our enumerators emphasize that areas and respondents were selected by chance and that the anonymity of respondents will be maintained.

Dunstan S. C. Spencer, University of Sierra Leone

Some Sources of Reluctance to Cooperate

The cooperation of the farmers was difficult to obtain for many reasons. First, farmers could not see any connection between agricultural research and their economic well-being. Second, there was a strong suspicion that the investigation might be seeking data for tax purposes. Third, many farmers detested any investigation into their privacy as regards their level of income and indebtedness. A good number would not cooperate unless they were assured of tangible rewards in the immediate future.

O. Ogunfowora, University of Ibadan (Nigeria)

Purpose of Study Interests Respondents

The difficulty of making respondents contribute positively to the quality of the information they provide stems out of the wide diversity of farmers' goals and interests. In general, I have found it helpful to explain the objectives of a study and willingly underscore any government involvement (without claiming some specific potential uses for the data being collected). This invites the farmer to provide some hints as to where his interest lies, giving the interviewer an opportunity to expand on the objectives most related to the farmer's interest.

One should refrain from stressing any goal that might alienate the respondent. In the technology adoption study, for example, we were certain of the general farmer discontent with government price policies. We further knew that the government was seeking information to decide whether to increase prices for that year's harvest. Consequently, we found the price issue a popular way to start a conversation with almost every farmer. But then we ran into very small farmers who, shrewdly enough, argued that the study we were undertaking was not serving their interest since it might give the government a basis for increasing the price of wheat and thus make it more difficult for them to buy wheat to supplement their own production and meet their family needs.

Salem Gafst, IBRD (Tunisia)

Villagers Appreciate Potential of Research

In my experience, very few individuals are unwilling to cooperate, even though we have never offered material incentives for cooperation. In Nigeria, after the interview we did explain the new farming methods we had asked about. Also, we tried to explain how information about farming was a prerequisite for any development effort. In Kenya, we were an aspect of the Special Rural Development Programme, which was a government programme which had just been introduced with great fanfare by officials. There we said again that our findings could be of great importance for the future work (which they were, because field experiments on introducing credit and hybrid maize were based on the results).

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

SUSPICION OF OUTSIDERS MAY BE JUSTIFIED

The reasons for suspicion, for refusal to be interviewed, do not derive from some kind of irrational backwardness. More often, they derive from a perfectly rational desire for defense against intruders from outside the community. One is well advised to find out, if possible, why some individuals refuse to cooperate. For research that deals only with the cooperator and neglects the non-cooperator may lose sight of a major component of rural life. It must be recognized that the interview method is an intrusion in rural society, without immediate or visible benefit to the respondent.

T. B. Kabwegyere, University of Nairobi (East Africa)

LISTENING TO FARMERS' PROBLEMS IS PRODUCTIVE

Farmers in Tunisia doubt that extension agents and other government employees can be of any help to them. This distrust is certainly well justified in a country like Tunisia where social awareness is still the privilege of a

small elite. It is, therefore, very helpful to spend some time visiting with the farmer to put him in a cooperative mood before starting the interview. Farmers usually like to talk about their problems. Finding somebody to listen and sympathize with them is a successful instrument in breaking the communication barrier between them and the interviewer. (This fact does, however, remind us of a reason for caution in dealing with responses. Farmers are intelligent people, and just as you try to sense what would appeal to them they try to sense what would appeal to you and reciprocate with the kind of information they think you expect.)

Salem Gafsi, IBRD (Tunisia)

DISTRUST FEEDS ON FAILURE TO EXPLAIN

One village elder in Kenya told our interviewer not to be upset if he was not welcomed by the people in the community. "People in the community have grown accustomed not to trust people who come from outside," the elder said. "No one comes from outside with good intentions. Everyone comes here to take something away from us and to tell bad stories about us. Some people come here to help us with their research, they say. Then they go back to university to receive degrees, and come back here as government officials giving us instructions and orders."

Obviously researchers are to blame for this distrust. Social scientists need to explain honestly and clearly to the community what their research is all about and how it is going to benefit the community (and a research project that does not directly address itself to some of the community's problems has doubtful likelihood of success). Researchers come to realize, sometimes through bitter experience, that a superficial knowledge of the community, combined with the community's misconception about the research program, can seriously compromise the validity and reliability of data. How can we expect people to participate and open their houses and minds to us when we are carrying out an activity they view as totally unrelated to their lives? Lack

of consideration of this fact may lead to disappointing experiences.

An international agency, for example, established a literacy project in an East African country. The international experts associated with the project attended the first session of one of the literacy classes and announced to the adult students that before-after tests would be conducted at the beginning and at the end of the course. At the first session a questionnaire was handed out which included items related to age, sex, family composition, family possessions, education, income, and other socio-economic variables. To the experts' surprise, only a few students showed up at the next class sessions. The disappointed teacher learned that the students considered the questionnaire an invasion of their privacy and could not perceive its relevance to learning how to read and write, and indeed they were correct. One can only speculate what could have been gained had the experts spent time consulting with the participants before bringing the test and questionnaire to the classroom, kept the length of the questionnaire to a more defensible minimum length, and been more forthright in explaining to the students why socio-economic information was needed.

Shawki Barghouti, Arid Lands Agricultural Development Program (East Africa, Jordan)

ACCEPTING LOCAL CUSTOM PUTS RESPONDENTS AT EASE

The researcher who continuously complains about living in an environment and yet wants its permanent dwellers to give him facts or their full co-operation will be deceiving himself, be he an indigenous person or an expatriate. Rural people usually appreciate the sincere enquirer but are quick to recognize the hypocrite.

Most urban dwellers forget that the rural person is never apathetic to what is going on around him, but he is not a busybody either. This short-coming can be worse if we have been used to the typical nuclear family system coupled with the attitude of "it is no business of mine." An

expatriate colleague in 1968 could not comprehend my continuous kneeling to greet older folks in the North. It was not long, however, through the relaxed reception we were accorded, before he understood me. How many researchers, in their suits or best pants, are prepared to sit readily on the bare ground to pay their respects to an ethnic chief as tradition demands? Usually, some courtesy will be offered you in the form of a chair, etc., but when there are none, please do not stand around looking for a comfortable place to sit and collect your facts. If anything, the respondent should be more comfortable than the researcher—after all we have our hands in his mouth!

John S. Nabila, University of Ghana

UNIVERSITIES HAVE A RESERVE OF GOOD WILL

In almost all cases farmers are generous and feel proud to entertain visitors, but when it comes to answering questions they get very suspicious. They must know who is making the study and what its objectives are.

Interviewers must not pretend that the interview will, for example, be used to improve living conditions in some way or other. Farmers are intelligent enough to know that this is not true, and some of them have been visited several times before by such groups with nothing coming out of such visits. Many have been so disillusioned by the promises of politicians that they no longer trust any such sayings.

From my personal experience I find that the response to questions is quite different when people come to know that we are from the university and *not* from any government department. Their response is better and at least they express themselves as willing to answer questions as best they can (in spite of which, we know that their answers may still not be very accurate). We try to show outright that we belong to the university, simply by using our own vehicles with the name of the department, faculty and university written out there.

At the beginning people may not talk to us "white collar"

officials, but will get acquainted first with our drivers, and so we try to make sure our drivers understand what we are doing.

A. M. El Hadari, University of Khartoum (Sudan)

Diplomacy Takes Time, Is Worth It

Diplomacy not only removes elements of antagonism but also promotes consistency and some level of reliability from respondents. One of my major problems was an over-eagerness of many migrants wanting to be interviewed. We had to follow strictly the original sample design, yet we could not turn down forthright such requests. As a compromise, we trained ourselves to go through the motions of an interview, scribbling down notes even though we knew the data could not be added to our sample. Yes, it was time consuming but it helped, we believe, in preventing unsatisfied people spreading wrong information which would have retarded our progress in the field.

John S. Nabila, University of Ghana

Long-Duration Studies Bring Morale Problems

When the survey extends over a long period, the field staff report a sharp decline in farmers' enthusiasm and willingness to cooperate. Nonparticipating farmers often ridicule the sample farmers by asking them to show what they gained from "all the bothers of the past year." Some sample farmers ask for loans and other assistance as compensation for their cooperation in the research project.

Some farmers in Idah division formed themselves into a union, holding more or less regular meetings, apparently in anticipation of the disbursement of expected government aid. When nothing was forthcoming, the farmers started to lose interest in the project. At this point we decided to give the farmers one cutlass each in appreciation of their cooperation and as an inducement for further

cooperation for the remaining period of the survey. The results proved positive.

O. Ogunfowora, University of Ibadan (Nigeria)

Offending a Key Local Person Can Be Costly

In my study in the Nuba Mountains, things went very well and the farmers were very cooperative on the first day of our visit to one of the villages. We could not finish interviewing that day, and when we came back the next day we were very surprised to be met with quite a different attitude. Most of the people were not there, and those present were not willing to talk to us. Later, we came to know the reason. Our questionnaire had included a part on marketing and credit, and here we tried to collect information from the farmers as to how they market their crops, the sources and terms of credit, interest charges, repayment, etc. In the village there was a key merchant whom unfortunately we did not meet the first day. When he learned about our interest he aroused the farmers against us, and since he controlled almost all buying, selling, and lending activities, he threatened those who were interested in meeting with us. This was of course mainly to protect his interests and keep outsiders from learning much about his transactions. It was too late for us to win his cooperation, and failing this we had to select another neighboring village.

A. M. El Hadari, University of Khartoum (Sudan)

XI. PRE-CODING, CODING, AND SOME PRELIMINARY STEPS IN ANALYSIS

FIELD DATA CHECKS REDUCE ERROR

We have found the following procedure effective in reducing recall and experimental error in the data:

First, the supervisor normally selects two or three questionnaires completed since his last previous visit and, either himself or in association with another enumerator, re-surveys the selected farmers.

Second, consistency checks are built into the questionnaires. For example, if a farmer indicates that he sold or consumed a crop in a certain time period, the activity of harvesting the crop should have appeared on the labor use form or its removal from storage on the inventory form.

Third, each enumerator completes a daily field diary recording his activities for the day, how long interviews and field recordings took, rainfall that day, the activities of any cooperating farmers he happened to notice during the day, and events occurring in the village. Activities of the farmers observed can then be checked with the field records.

Fourth, the supervisor visually checks each questionnaire in the field for missing information and for data falling outside what experience suggests are the reasonable upper and lower limits.

Fifth, supervisors are urged to have informal discussions with farmers on how they attempt to circumvent their farming problems. What is learned can be cross-checked

with the daily activities and management strategies of the farmer.

Two later sequences of checks can be initiated by computer routines. Numerical codes and values of parameters are checked for consistency, and edits are run to check sequences of operations. For example, if a crop is sold it must have been harvested from a plot, so edits are made back through that plot to see that labor was allocated to harvest, weed, and plant it and to assure that the crop was recorded on that plot. Errors observed as a result of these tests are referred back to the supervisor.

These field checks of data are admittedly weak. They principally ensure that the data recorded are within anticipated limits, that errors in transposition do not occur, and that information requested is not overlooked.

John Flinn, IITA (Nigeria)

PLANNING FOR QUICK, ECONOMICAL DATA PROCESSING

Given identified type-of-farming areas, sample size for most kinds of farm management studies will rarely need to be more than 100 to 150 farms. Economy in sampling avoids the data handling problems associated with census operations; the tabulations required can be planned as a part of the survey design.

I have always used large sheets with perhaps 50 farm records on each sheet. I have found it particularly useful to have a *column* for each farmer, with farmers grouped by first-stage sampling unit and by enumerators. This allows comparison across first stage units to detect geographical variations in the type of farming and identify any possible failing in homogeneity of the farming system over the area. It also allows comparison across enumerators to bring out differences which might indicate misunderstanding of a particular question or negligence on the part of individuals. (However, these latter problems should not reach the tabulation stage, but should be spotted at the beginning of the field work by the supervisors.)

The end result of our studies should be recom-

recommendations that can be put in the hands of the extension services. This demands that staff and funds be allocated to complete the whole cycle without interruption and undue change of plan or personnel. One of the tragedies of farm management research in many developing countries has been the piles of unprocessed data gathering dust on the shelves.

*Michael Collinson, Commonwealth Development Corp.
(East Africa)*

Adapt Schedules to Data Processing Needs

Even for a small sample, say less than 30 farms, it soon becomes impossible to deal manually with all the data being generated. Therefore, the ability to store data on punched cards or magnetic tape for computation by a computer is highly desirable. Even then, the time involved in tabulation and in transcription of the data on coding forms is often frightening.

Some researchers might be tempted to drop some of the data of lesser importance. There exists, however, a handy solution to this problem—information recording forms from which the keypunching can be done directly. These forms avoid the need for manual transfer of data.

In our rice cost route survey, the information to be punched on cards appears in brightly colored columns and rows and is written in a distinctive red ink. Each column on the form corresponds with a column on the punch card. Each row on the form corresponds with one punch card. All activities, fields, crop compositions and units of measure are coded on the form. Hence, only numbers appear in the brightly colored columns.

Interviewers quickly became familiar with this form and had no problems using it. At the start of the survey, several codifications had to be added or changed. After two weeks of interviewing, most codifications were fixed.

Eric Tollens, National University of Zaire

Computer Experts Help Design Schedule

Our formal interview schedules are now designed in consultation with the manager of the Computer Center to allow (where possible) direct punching of the collected data from the field sheets to data processing cards. (The supervisors, *not* the enumerators, code the data on a coding strip provided on the right-hand side of each interview schedule.) Questionnaires are drawn up and pre-tested on the enumerators, modified, and then tested by the cooperating scientists on a sample of farmers before being finally prepared for field use.

John Flinn, IITA (Nigeria)

Prompt Coding Reveals Inconsistencies

We have not used pre-coded questionnaires. One of our major activities has, therefore, been the coding of field questionnaires ready for computer analysis.

One advantage of having supervisors work out of project headquarters is that someone then goes out to each enumeration area or locality once or twice a month. All completed questionnaires can then be brought back, sorted out, and coded. Doing this as field work is in progress allows errors and inconsistencies to be spotted and corrected before the end of field work.

Dunstan S. C. Spencer, University of Sierra Leone

Researcher Must Watch Coding Closely

All questionnaires were coded by teams of two coders working on the same sub-set of items. Once completed, another team of two coders checked the work of the first team and recorded all errors. Errors sometimes reflected multiple interpretations of the same data, and were re-analyzed by the researcher.

At the same time, all responses put into the "other" category were recorded separately for the researcher to analyze. Sometimes recoding back into one of the set codes

was possible. In other cases, the coding scheme had to be adjusted to accommodate the data.

At no stage of the coding procedure could the coding scheme be considered fixed and the coders able to work on alone without consultation with the researcher.

Marjorie Mbilinyi, University of Dar es Salaam (Tanzania)

Making Forms Easier to Check

The survey form I have used permits the coding to be done directly on it. Strictly speaking such a form is not pre-coded, but keypunching can be done directly from it. All activities, fields, crop compositions, and units of measurement are codified.

These forms are easy to check for errors. Recorded data can be easily retrieved by any researcher without much explanation, and this promotes the exchange of data among interested researchers and facilitates inter-country comparisons.

The major drawback of these forms is poor space utilization and a resultant proliferation of punch cards.

Eric Tollens, National University of Zaire

PRE-CODING DEMANDS GOOD PRIOR KNOWLEDGE

For proper design of a pre-coded questionnaire one must have a thorough knowledge of the system being investigated. Such prior knowledge was not available to us in Sierra Leone. Furthermore our experience has shown that enumerators of the quality we use (Form IV school leavers) tend to make an unacceptable number of mistakes in using codes. Such mistakes would be difficult to spot when using pre-coded questionnaires. In any event a pre-coded input-output questionnaire would have been enormous.

The need to collect quantitative information has also restricted our use of completely unstructured questionnaires with many open-ended questions. Usually the best

we can do is to include a catch-all question ("other-specify") at the end of a given list of possible answers.

Dunstan S. C. Spencer, University of Sierra Leone

COMPUTER TESTS INTERNAL CONSISTENCY

Information can be put on cards in such a way that internal consistency checks, such as sums and means, can be run immediately. Any errors detected can be traced back to mistakes in transferring data from the survey forms to the processing forms, or computational mistakes in the processing forms, or punching errors. There is no doubt that processing time and error rate have been substantially reduced as a result of the computer being available.

David Norman, Ahmadu Bello University (Nigeria)

WAYS OF VERIFYING RESPONSES

To verify responses various methods have been used in the projects in which I have participated: split-half comparisons; reinterviews (in cases of extreme doubt); within-schedule checking for internal consistency (most frequently used); including the same questions in the sample survey questionnaire as in the panel study questionnaire, and validation by using the data together with data separately collected. As an example of the last method, in a study on the agricultural development of sublocations we aggregated the data on individual farmers for each sublocation and then collected information from the extension worker responsible for each sublocation. The existence of clear relationships between the characteristics of the extension worker and the characteristics of the sublocation (its score for agricultural development based on a Guttman Scale) could be viewed as an indication of the quality of the survey data.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

Double-Checking Yield Plot Results

Yield plot figures can be subjected to further checks. When the harvest of a particular plot is completed we ask the farmer to estimate the yield of that crop in that particular plot (in local units) and the reasons for the yield being higher or lower in that particular season than "normal" and in comparison with his other fields. We also make an alternate estimate of aggregate production at the end of the survey by summing sales, gifts, and home consumption of farm grown products (after making allowances for storage losses, changes in inventory, and material used for planting).

John Flinn, IITA (Nigeria)

Complicated Statistical Analyses Often Not Needed

Limiting analysis to frequency counting and cross tabulation is often a wise choice. If our purpose is to provide socio-economic data and insights for planners or other practitioners, we need to recognize that complicated indices and multiple correlations tend not to be understood and seldom produce hard parameters for decisions. For example, in the course of long experimenting with "least square delete procedures" to identify the smallest set of best predictors of innovativeness and change agent contact for the Nigeria data, I became very skeptical about the value of such sets of predictors as bases for action and planning. Even if one has sophisticated equipment available, it may still be preferable to avoid complicated analysis procedures.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

IMPROVEMENTS IN DATA HANDLING PRACTICES

The baseline study for the "guided change" project, currently underway, has involved a radical change from the survey forms used in the original farm management

studies. Among the refinements which have been added in this project, in the light of experiences arising from the earlier farm management studies, are:

1. To increase efficiency in data collection in the field:
 - a. The keys to the codes for the various forms have been entered on the survey forms themselves.
 - b. An attempt has been made to minimize the necessity of frequently turning pages during the interview in order to make entries.

2. To increase efficiency in the data processing stages:
 - a. Numbers are used rather than letters for the coding system to facilitate entering the data straight on to cards.
 - b. Analysis sheets for entering the data on to punch cards are designed at the same time as the survey forms. As well as allowing processing to proceed almost simultaneously with data collection, it gives the opportunity for the survey forms to be modified if necessary in order to increase efficiency in processing. Because of the large amounts of information required on a daily basis and the limited capacity of the ABU computer it is not yet possible to punch data straight from the survey forms. Instead the data are first aggregated into weekly totals.

3. In order to minimize the possibility of losing data through fire or carelessness, survey forms are collected once a week compared with once a month as in the earlier farm management studies.

David Norman, Ahmadu Bello University (Nigeria)

Code Book Preserves Usefulness of Data

A carefully worked out code book which is kept with the completed schedules enables one unfamiliar with the study to understand what has been recorded. Thus data can

easily be retrieved for analysis by any other researcher without much explanation. This objective way of data recording promotes exchange of data between interested researchers and facilitates inter-country comparisons.

Eric Tollens, National University of Zaire

Secondary Analysis Must Be Encouraged

The scarcity of quantitative data in many developing countries and the costs involved in their collection make it imperative that each research worker's data be available for use of others to test hypotheses of their own. One obvious approach is to be in position to provide duplicated packs of punched cards to interested research workers. Because many research workers do not have access to machines of different makes, we have also published much of our basic data in reports supplemental to the main research report.

David Norman, Ahmadu Bello University (Nigeria)

How To Facilitate Secondary Analysis

In my experience, preparation for secondary analysis requires a lot of work, especially when it comes to cleaning the deck and preparing a good codebook which can be used by a stranger without previous acquaintance with the analysis procedures. Even then, it is usually necessary to ask the person(s) who constructed the codebook for clarifications.

In Kenya, Ascroft developed a simple idea for allowing others to benefit from the data collected. The benchmark sample study for the field experiment concentrated heavily on behavioral measures, sociographic data, and other straightforward basic information about the sampled households. This could be collected with a short schedule which did not take long to fill. With Ascroft's assistance, other researchers could then go back to the same sample with short schedules of additional questions covering the

topic of their interest. The cards with these additional data could then be analyzed in relation to any variables covered in the original deck.

Niels G. Röling, Agricultural University, Wageningen (Kenya, Nigeria)

TASKS CHANGE AS THE STUDY PROCEEDS

Most field surveys require attention to a long list of different activities, each one of which needs to be done carefully and well if the project is to succeed. At any point in the study I can check against the following sequence to foresee and prepare for the tasks that lie ahead:

1. Getting official government and/or university clearance.
2. Contact with local and regional authorities.
3. Elaboration of the data collection instrument—drawing up of survey questionnaires and forms.
4. Ordering of materials and equipment for the survey.
5. Hiring field supervisors and/or survey assistants.
6. Elaboration of a sampling plan, including stratification of the population and determination of a sampling frame.
7. Drawing the sample.
8. Hiring field enumerators.
9. Training field enumerators.
10. Receiving materials and equipment.
11. Organization and running of a pilot survey (optional).
12. Contact with the selected farmers.
13. Posting of field enumerators.
14. Day-to-day management of the survey.
15. Supervision—checking survey results.
16. Termination of the survey.
17. Contract termination with enumerators and/or survey assistants.
18. Compilation and handling of the survey data.
19. Analysis of the survey data.

20. Write-up of the research report.
21. Publishing of the research report.
22. Distribution of the research results.
23. Final report to the research project sponsor.

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USES AND USERS OF RESEARCH

Few researchers view themselves as producers of information for some particular use, let alone having specific utilizers in mind. Usually researchers see themselves as contributing to a fund of knowledge accumulating for improved understanding of the world at large. In practice such vague purposes imply a target group of university professors, including one's own immediate university peers and colleagues. There is little recognition of the fact that, outside this specific circle, one must make quite an effort to get research reports read by people whom one wishes to influence.

Social sciences have a reputation of impracticality and uselessness to live down. Ascroft has pointed out that whereas a majority of social scientists in the developing countries will describe their work as highly applied and practical for the development of the nation, the intended users (government officials, policy makers, project managers) are more likely to view it as "ivory tower," lacking in applicability, impossible to read and understand, etc.

Part of the problem is a lack of willingness of the researcher to specify the intended user and get to know his needs, motivations, existing knowledge, language use, and the like. Often there is a conflict in target group in that the research worker wants to please his colleagues (and/or his dissertation committee members) *and* his intended utilizers. If a dual-purpose report only makes both groups unhappy, it may be better to write separate reports for each group.

In all cases, the intended user of the findings must be carefully defined. General contributions to the fund of knowledge seem to be an inappropriate objective for most

social science research in developing countries. More often the need is to assist a specific nation in solving a specific problem.

Types of users of research could be characterized as follows:

- a. Students, whom one wants to provide with materials relevant to their own country.
- b. Policy makers, who need to know about trends in national development, redefinitions or diagnoses of national and/or sectoral problems, variables manipulable through policy measures, and indicators that can provide feedback on previous policy measures.
- c. Implementers (project and program officials) who need tested prototype strategies, information about target groups, knowledge about the potential of particular rural areas, and feasibility or monitoring or evaluation studies.
- d. Farmers and other specific citizen groups looking for help in identifying problems facing them and foreseeing the probable effects of alternative choices. For farmers, especially important may be feedback which allows them to assess yield increments, the effect of better practices, etc., so as to permit more purposeful behavior.
- e. Other researchers in the same field. This is probably the most usual target group; that is, it is the group which receives the products of research undertaken on the initiative of the researcher himself (in contrast to research performed on the initiative of and as a service to others).
- f. Researchers in other fields. An increasingly important category; consider how socio-economic surveys could allow the profiling of different categories of farmers so that agricultural research stations could develop recommendations relevant for each category.
- g. Promoters, change agents, and other purposeful communicators who need information about their target groups in terms of composition, language use,

telt needs, etc., as well as pretesting of messages, campaigns, etc. They may also require small-scale field experiments to test methods and strategies.

- h. Development planners who need a regular flow of information on the current status of national/regional sectoral activity and diagnoses of economic and social problems to allow them to specify objectives and allocate resources and efforts.
- i. Pressure groups who seek information to support their case for particular policy positions and actions. Groups opposing injustice, corruption, and accumulation of power and wealth by the few may be in particular need of help in securing accurate information to support their case.

An important issue of research purpose is the choice between a *science-orientation* and a *design-orientation*. This distinction, spelled out by H. A. Simon (*The sciences of the artificial*, 1969, MIT Press, Cambridge, Mass.), does not refer to research design but to design in the sense of *creating the artificial*.

Research which is science-oriented defines its problems from a theory. Its products are scientific theory or generalizations fitting into a basic scientific paradigm. Its focus is on theoretically relevant factors, its success criterion is the contribution to the fund of knowledge, its target group is made up of other scientists.

Research which is design-oriented defines its problems from a social need. Its products are recommendations or strategies. Its focus is on manipulable factors, and its success criterion is the utility of results in problem-solving. Its primary target group is decision makers.

Design-oriented research usually requires an additional phase beyond the usual steps of identifying and defining important parameters, developing hypotheses, measuring frequency of occurrence of important parameters, and establishing relationships. Design-oriented research is not complete without *experimentation* to identify causal relationships and test the "artificial." Whereas science-

oriented research has the option of engaging in such experimentation, for design-oriented research it is obligatory because the aim is to develop recommendations rather than be satisfied with an explanation and derived implications.

Social scientists in the developing countries have a special contribution to make through design-oriented research which cannot be satisfied if they limit themselves to a science-orientation.

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LISTING OF EXCERPTS FROM PARTICIPANT PAPERS AND WORKING GROUP REPORTS

I. Research Approaches and Aims of the Study

- The first question: purposes of data collection (Beirut working group)
- Integrating the elements of a research design (Röling)
- Necessary steps in a study (Flinn)
- A check list to improve field data collection (Beirut working group)
- Brief description finds frequent use (Ascroft)
- Adapting to bureaucratic realities (Husain)
- Obstacles to coordination of research efforts (El Hadari)
- Formal plans aid multi-disciplinary team (Flinn)
- Six common strategies of data collection (Beirut working group)
- When is cost-route method appropriate? (Tollens, Spencer)
- “Tracer” interviews follow people and goods (Nabila)
- A plea for experimentation (Röling)
- Make difficult problems less data-intensive (Husain)
- Factors influencing data collection strategy (Beirut working group)

II. Preliminary Steps: Area Familiarization and Reconnaissance or Baseline Studies

- Steps in “area familiarization” (Beirut working group)
- Local knowledge sharpens questions, hypotheses (Gafsi)
- Realities of research come from the field (Nabila)
- Build knowledge of usual farming practice (Flinn)

Farming practices affect survey procedures (Collinson)
Crop research workers add valuable background (Uchendu)
Utilization of historical sources (Beirut working group)

III. Considerations in Sampling

Choice of sampling methods (Beirut working group)
How budget influences sample size (Tollens)
Limited knowledge of variance a problem (Spencer)
The cost of greater accuracy (Collinson)
Why stratification permits economies (Tollens)
Area stratification reduces risk (Spencer)
Indirect measures of stratification criteria (Norman)
Knowledge of structure of farming useful in sampling (Mbilinyi)
Steps in multi-stage area sampling (Ascroft)
Multi-stage random sample cuts cost, improves control
(Gucelioglu)
Clustered samples save travel time (Tollens)
Random sampling at the area level (El Hadari)
Getting data for area sampling (Ogunfowora)
"Farming type areas" useful in sampling (Friedrich)
Administrative areas: a doubtful sampling base (Collinson)
Maps as a starting point for area sampling (Röling)
Constraints of feasibility in village selection (Norman)
Purposive selection of villages (Flinn, Norman, Ogunfowora)
Using two sampling methods in a single study (Spencer)
Baseline survey designates units for sampling (Flinn)
Building and verifying the sampling frame (Spencer)
Ingenuity can sometimes make faulty lists usable (Collinson)
Local knowledge must be acquired (Gafsi)
Precise definitions save later confusion (Gucelioglu)
Numbering of housing units aids sampling (Norman)
Replacement within the original sample (Spencer, El Hadari)

IV. Local Support and Cooperation

Area preparation: a vital exercise (Collinson)
Letters of introduction smooth the way (Mbilinyi)
Aid in national planning stressed (Gucelioglu)
Winning cooperation takes time and patience (Ogunfowora)
Drawing sample is made a village project (Flinn)

Association with village leaders promotes confidence (El Hadari)
Maintaining acceptability throughout the community (Mbilinyi)
Voluntary nature of participation emphasized (Norman)
Villagers respond to openness and frankness (Flinn)
Participation makes study more culture-sensitive (Barghouti)
Official backing: a help and a hindrance (Röling)

V. Developing and Using Data Collection Instruments

Alternatives in data collection instruments (Beirut working group)
Limitations on mailed questionnaires (Kabwegyere, Spencer)
Possibilities and limitations of recall (Collinson)
Factors that influence recall (Norman)
Use of recall in studies of adoption (Röling)
Preferred frequencies of interviewing (Friedrich)
Weekly visits solve some problems (Getachew Tecele Medhin, Telahun Makonnen)
Length of recall differs for different variables (Spencer)
Fit interview frequency to study's needs (Flinn)
Pictorial data sheet is being tried (Spencer)
Structure follows exploratory studies (Ascroft)
More structure needed in single-visit survey (Collinson)
When to use a structured schedule (Norman)
Pre-testing sharpens the research instruments (Nabila)
Making pre-testing more productive (Collinson)
Adapting form of question to data requirement (Flinn)
Open-ended questions bring more, demand more (Mbilinyi)
Shorter schedules produce better response (Gafsi)
Practical reasons for keeping schedules brief (Ascroft)
Proper pre-testing streamlines the schedule (Röling)
Ambiguity causes problems in analysis (Gafsi)
Unreasonable questions yield unreasonable answers (Norman)
Record book stimulates recall (Gucelioglu)
Choice of wording will affect responsiveness (Barghouti)
Well-planned projective devices work effectively (Mbilinyi)
Socio-psychological concepts not too useful (Röling)
Answer-suggestive questions distort replies (Gafsi)
Multiple choice questions not easily understood (Barghouti)
Valid alternatives help inexperienced respondent (Mbilinyi)
Use local language in designing schedule (Nabila)
Local language reduces interviewee suspicion (Barghouti)

Translation carries risk of ambiguity (Gafsi)
Translating questions gives interviewers good training (Röling)
“Back translation” helps clarify questions (Ascroft)
Literal translations contain pitfalls (Kabwegyere)
Defining the unit of data collection (Beirut working group)

VI. Problems with Specific Variables

When direct measurement is essential (Norman)
Weigh costs and benefits of increased accuracy (Ogunfowora)
Some areas of response raise special issues of reliability (Flinn)
Income proxies give satisfactory measure (Röling)
Problems with specific quantitative variables: output (Beirut working group)
Identifying local units of measurement (El Hadari)
Standard measurements may be unknown (Kabwegyere)
Standardizing customary measures (Getachew Tecle Medhin and Telahun Makonnen)
Requirements of the yield plot method (Tollens)
Drawbacks to yield plot sampling (Flinn)
Side benefits from teaching yield measurement (Röling)
Cropping mixtures introduce problems (Ogunfowora)
One approach: simplify list of crop combinations (Flinn)
Observation supplies data on price (Beirut working group)
Cautions in utilizing price data (Flinn)
Market sales records need scrutiny (Mbilinyi)
Problems with specific quantitative variables: land (Beirut working group)
Essential to understand local land measurement units (Röling)
Direct questions on land area often unrewarding (Kabwegyere)
Farmers often lack “area unit” concept (Uchendu)
Considerations in field or plot measurement (Tollens)
Sensitivity about land holdings (Flinn)
Proxies for field size not too helpful (Norman)
Few good alternatives to direct measurement (Ogunfowora)
Field measurement techniques (Tollens)
Identification of fields and plots (Flinn)
No easy scheme for field identification (Ogunfowora)
Soil maps too general for village level use (Tollens)
Problems with specific quantitative variables: labor inputs (Beirut working group)
Accounting for time reveals labor input (Tollens)

Issues in gathering labor input estimates (Flinn)
Spencer's weighting factor widely accepted (Tollens)
Travel to fields is a labor input (Ogunfowora)
A caution about farmer's field travel time (Tollens)
Loan of clocks improves time use data (Getachew Teclé Medhin
and Telahun Makonnen)
Problems with specific quantitative variables: capital and man-
agement (Beirut working group)
Managerial input still defies measurement (Ogunfowora)
Problems in dealing with qualitative variables (Beirut working
group)

VII. Recruitment and Qualifications of Interviewers/ Enumerators

Sources of field staff (Beirut working group)
Interviewers/enumerators are the key link (Norman)
High educational standards increase turnover (Ogunfowora)
Personal qualities of enumerators (Spencer, Röling, Flinn,
Nabila, Tollens, Gafsi)
Roles for both male and female interviewers (Kabwegyere)
Advantages to hiring interviewers from the region (El Hadari)
Strangers to the region have problems of acceptance (Mbilinyi)
Students can be effective interviewers (El Hadari)
Reducing the mercenary element (Kabwegyere)
Interviewer enthusiasm can be awakened (Ascrott)
Data quality improves as interviewers gain experience (Norman)
Permanent enumerator staff is ideal (Collinson)
Incentives for interviewer continuity (Ogunfowora, Spencer,
Tollens)
"Borrowed" staff bring problems (Flinn)

VIII. Training Interviewers and Directing Their Work

Field staff training needs (Beirut working group)
Interviewers must understand the study (Gafsi)
Content of the training program (Röling, Flinn)
Train in classroom and in the field (Ogunfowora)
Training trainers of interviewers (Gucelioglu)
Aims and functions of field supervision (Beirut working group)
Considerations in planning for supervision (Gafsi)

Two ways to combat cheating, unreliability (Mbilinyi)
Research workers must help with supervision (Spencer)
Adequate research direction demands physical presence (Norman)
Other qualities more important than "contacts" (El Hadari)
Strategic placement of field supervisors (Collinson)
Twice-monthly supervisory visits desirable (Tollens)
Giving the enumerator material support (Beirut working group)
Many factors influence interviewer morale (Norman)
Form of payment affects interview quality (Gafsi)
Some estimates of interviewer work load (Flinn, Tollens)
Rigid work schedule is not practical (Norman)
Travel time eats into interviewing hours (Gafsi)
Two ways to handle logistics of interviewing (Röling)
Schools may offer low cost lodging (Gafsi)

IX. Interviewing Techniques and Problems

Locating survey respondents (Gafsi)
Be prepared to yield to the weather (Gucelioglu)
Criteria for determining "head of household" (Ascroft)
Family composition not easily established (Tollens)
Multi-household compounds pose a problem (Norman)
Male-female work roles affect data collection (Röling)
Household head may not know all the answers (Norman)
Rapport with whole household is needed (Spencer)
Interviewers can help to spot discrepancies (Gafsi)
Which are the "sensitive" topics? (El Hadari)
Reluctance to respond often overestimated (Norman)
Admit it when asking sensitive questions (Tollens)
The art of interpreting answers (Mbilinyi)
Interviewing situation may introduce bias (Barghouti)
Sources of bias in response (Röling)
Private interviews avoid some problems (El Hadari)
The farmer's field: good site for some interviews (Ogunfowora)
Some surveys must be timed to crop seasons (Tollens)
Interviewing is easier in slack seasons (El Hadari, Flinn)
Weather affects farmers' responsiveness (Ogunfowora)
Two-hour interview exhausts patience (Tollens)
Subsamples can reduce interview fatigue (Spencer)
Interviewing team offers advantages (Gafsi)

Field observations improve the study (Beirut working group)
Supplementary notes help interpret schedules (Gafsi)
Information flow can be two-way (Flinn)
Enumerators find reference manual useful (Spencer, Ogunfowora)
"Event manual" aids respondent recall (Nabila)

X. Winning Cooperation of Respondents

Local functionaries can help at crucial times (Spencer)
Community mood affects climate for interviews (Kabwegyere)
Respondent incentives only if required by tradition (Nabila)
Incentives had questionable value (Norman)
Material rewards build expectations, tensions (Tollens)
Material goods not the only incentive (Flinn)
Limit field staff to promises that can be kept (Ogunfowora)
Respondents appreciate assurance of anonymity (Spencer)
Some sources of reluctance to cooperate (Ogunfowora)
Purpose of study interests respondents (Röling)
Villagers appreciate potential of research (Röling)
Suspicion of outsiders may be justified (Kabwegyere)
Listening to farmers' problems is productive (Gafsi)
Distrust feeds on failure to explain (Barghouti)
Accepting local custom puts respondents at ease (Nabila)
Universities have a reserve of good will (El Hadari)
Diplomacy takes time, is worth it (Nabila)
Long-duration studies bring morale problems (Ogunfowora)
Offending a key local person can be costly (El Hadari)

XI. Pre-Coding, Coding, and Some Preliminary Steps in Analysis

Field data checks reduce error (Flinn)
Planning for quick, economical data processing (Collinson)
Adapt schedules to data processing needs (Tollens)
Computer experts help design schedule (Flinn)
Prompt coding reveals inconsistencies (Spencer)
Researchers must watch coding closely (Mbilinyi)
Making forms easier to check (Tollens)
Pre-coding demands good prior knowledge (Spencer)

Computer tests internal consistency (Norman)
Ways of verifying responses (Röling)
Double checking yield plot results (Flinn)
Complicated statistical analyses often not needed (Röling)
Improvements in data handling practices (Norman)
Code book preserves usefulness of data (Tollens)
Secondary analysis must be encouraged (Norman)
How to facilitate secondary analysis (Röling)
Tasks change as the study proceeds (Tollens)
Uses and users of research (Röling)