
Section I: The expanding role of qualitative research in international development

Section introduction

This section deals with those papers which opened the RAP Conference and were intended to define the parameters of the methodological approach and set a stage for further discussion. The role of qualitative research in international development is defined and analyzed by Cernea and Pedersen and more specifically in the field of nutrition by Scrimshaw and Pelletier. Rhoades' paper, which although not presented at the conference was specially requested by the editors for inclusion in this volume, adds additional fuel to the growing debate on the usefulness and cost effectiveness of much of the past and current studies which are intended to inform the development process.

These papers provide a review of the foundations upon which RAP and RRA rest. They reflect the excitement of an emerging field as well as the need for caution against arrogance and the need to maintain professionalism and scholarship as guiding beacons for further developments in these qualitative fields.

5. The coming revolution in methods for rural development research

By Robert E. Rhoades

Robert E. Rhoades is Chairman at the Department of Anthropology at the University of Georgia.

This paper describes the author's progressive disillusionment with quantitative questionnaire methods used to evaluate rural agricultural programmes, and goes on to describe a diverse selection of participatory, qualitative methods that offer promise of more realistic and useful information about what farmers believe, their practices and their reasons for their behaviour.

The expense, time and invasiveness of quantitative surveys are referred to in a number of other papers in this volume, but not as specifically documented as here. Too often, when surveys have been done the reports are largely descriptive with too little emphasis on prescribing how the interventions could be improved. Such experience led to experiments in the health field with various qualitative approaches. One result was an UNU-UNICEF initiative that led to the publication of RAP Guidelines and to the many RAP applications in the health sector as presented in this volume. - Eds.

IN 1980 SENIOR ECONOMISTS and agronomists representing the international agricultural research centres gathered in Mexico at CIMMYT to discuss methods for conducting agro-economic, farm-level research aimed at generating appropriate crop technologies for small farmers^{1,2}. The productive and very lively meeting focused largely on the tried and true, traditional research methods available to agricultural scientists concerned with linking technology with farmer needs. These research methods included questionnaires, farm budgets, on-farm trials, experiments, cost benefit analysis, yield extrapolations, various statistical tests and sampling techniques. As an anthropologist, a rare breed in the international centres back in those days, I was allotted five minutes to speak on anthropological or what the workshop organizers called "informal methods." My brief paper, "Notes on the art of the informal survey," was met with a mixed reaction [1].

The primary concern of even anthropologically sympathetic agronomists and economists was how can such informal methods produce any degree of reliability, statistical proof, or generalizability? These were the very charges I feared most (as an uninitiated postdoc): that I was not a SCIENTIST! I had nervously anticipated this to a degree, and for that reason tried to cover myself by calling my method an "art" and not a "science."

While today I still basically endorse that distinction, my motive a decade ago was in a great part to ward off the attacks of a group of very prestigious but doubting economists and agronomists. Little did I know that during these same years, many other experienced workers in rural and agricultural development were beginning to question the appropriateness of the traditional research tool kit. Their voices were few and their methods or research tools were described mainly in the grey literature (what self-respecting journal would jeopardize their reputation by publishing *The Art of the Informal Survey!*)³ The past ten years, however, have brought what I see as a coming revolution in methods from agricultural and rural development research. In this paper, I want to reflect on what this new era will bring and how agricultural researchers can benefit from the changes. I should make it clear at the outset that this is not a dialogue about how the earlier pioneers had gone wrong and are about to be saved by the new guard. My purpose is much simpler: explore the old in light of the new alternatives in methods and point to common ground for practical action in solving problems with rural people.

The questionnaire syndrome

Although we could begin our discussion with many methods, I have selected the problem of the questionnaire survey as a way to address the broader issue of the need for new thinking about research among the rural poor. I do not aim to totally discredit the questionnaire (as you will note, I see a role for the sensible, focused questionnaire) but rather to illustrate how research tools can run astray from their original purpose and become ends of themselves rather than simply tools to help us understand farm house-holds and agrarian systems.

Ironically, my argument in Mexico ten years ago for more flexible and even qualitative methods was based not on anthropology (in which I received a PhD), but on quantitative sociology (in which I received my M.S. several years earlier). Little did I realize then (but have come to understand since) that, generally speaking, agronomists, economists or agricultural scientists, respective of discipline, are not professionally trained in the development and use of the

questionnaire⁴. If they had been, I do not think that we would have gone as far on the questionnaire bandwagon as we have over the past few years.

Sociology, among all disciplines, is most responsible for the development of the questionnaire survey. Positivism, the belief that human behavior and institutions can be predicted and quantified as in the natural sciences, has been the dominant school of thought since the 19th century when the French philosopher Auguste Comte promoted his science of society theory. This orientation, along with the notion of Emile Durkheim's "social fact," which he argued can be measured and counted like physical phenomenon gave birth to the empirical school of western sociology and its agricultural counterpart, rural sociology.

The quantitative sociologist's primary tool for testing hypotheses about social behaviour is the questionnaire which is constructed to contain dependent and independent variables. Strict statistical analysis is applied to the results to determine if pre-formulated hypotheses are rejected or accepted. Random sampling and minimization of any bias are to maintain scientific respectability in the eyes of scientific peer groups. Many sociological surveys aim to uncover the relationship between a social behaviour and levels of education, income, social class, ethnic identity, family size, etc. In agricultural research, this kind of questionnaire reached its most popular zenith during the "diffusion of innovation" school of Everet Rogers (1963) who aimed to correlate technology adoption rates with everything from kinds of magazines read to social status to number of in-house toilets. During this period, many students from developing countries were taught this questionnaire method either through visiting foreign professors or their own national professors returning from places like Cornell University, Iowa State, and other American Land Grant Schools⁵.

For individuals who went on to become professional sociologists, however, experience taught that any questionnaire had its strengths and weaknesses. Strengths were (1) large numbers of people could be surveyed; (2) statistical analysis, random sampling, levels of confidence could be achieved with quantified data, and (3) generalization was possible. At the same time, important weaknesses were stressed: (1) what people say is not what people do; (2) the results are cultural and time-bound; (3) context of an activity is not revealed; (4) the person asking the questions introduces a bias since deference or untrue answers may be given; and (5) sampling is a tricky business, particularly in places where people do not have phones or mail boxes or do not live on linear streets; (6) analysis takes times, especially if done by hand and even when computers are available there is no guarantee of speedy results.

The truth of the matter, however, is that very few Third World agricultural and rural development workers or scientists became tropical Talcott Parsons. The problems surrounding questionnaires were quickly forgotten and the elaborate questionnaire has hung around to plague rural projects and people for more than 30 years. By the early 1980s, using the questionnaire had developed into an industry.

What had been forgotten is that the questionnaire technique was borrowed directly from academics where the objective was to empirically test hypotheses in order to write a graduate thesis or publish in an academic journal. The manner in which the questionnaire was formulated did not allow the instrument to discover systems, explore cognitive perceptions, or to help

identify social and even technological problems. Least of all did the questionnaire solicit input and participation of farmers or "users" in exploring relevant questions. Instead, questions were formulated largely outside the farming community and therefore constructed in a language difficult for farmers to understand.

Another motivation to use the questionnaire, the pressure to produce "numbers," further subverted the need to "understand" in favour of the need to "impress" founders and scientific colleagues. Furthermore, for many rural development researchers a guiding principle dominated action: when in doubt about what first to do, "administer" a questionnaire. Who was it that pointed out that medical doctors also "administer" pills to their ill patients (when they do not know what else to do)? The questionnaire was used much like a comfort blanket to a small child.

I would like to offer a few frustrating examples I encountered with the questionnaire during my work with the International Potato Center which helped reshape my thinking and support my belief in the need for more diversified methods.

Case 1: Limitations of revealing relations (Philippine storage case)

A CIP post-harvest technologist (Robert Booth) and I were working with Philippine potato workers in generating a new method of low cost seed potato storage on the Mountain Trail (Benguet). When it became obvious adoption of the "technology" was taking place, the team traveled up the trail documenting informally the acceptance process. We took field notes, drew maps of diffusion routes, listened to key informants, and let farmer groups tell us what was happening. Yet the irritating sensation of the team was that no one would believe us unless we assigned "numbers" to the adopters, non-adopters, and statistically correlated this with other aspects. The job of constructing the questionnaire fell to me as the team's social scientist. Based on my prior sociological training, I constructed a seven-page questionnaire which began by asking the farmer a series of questions about (1) education; (2) size of farm; (3) crops grown; (4) family size; (5) distance from the main road, (6) marketing practices, and (7) income. These questionnaires were then given to enumerators we had quickly trained. The questionnaire was "administered" to 120 farmers and results sent to Lima, Peru where they were tabulated. The number of adopters was high but nothing else correlated. While the fact that a CIP-introduced potato technology was being adopted by farmers was received with enthusiasm by CIP and the Philippine national programme, our team was disturbed that the questionnaire did not seem to reveal new information other than numbers of adopters.

Subsequent follow-up by the CIP-Philippine team revealed why the questionnaire was not the only tool we needed, especially for guiding future research. Among these: (1) the enumerators felt awkward in filling out the difficult, sensitive (and perhaps irrelevant questions) so they often simply guessed and jotted in their best estimate; (2) the questionnaire did not get at locally sensitive questions related to power, including control of seed and inputs; and (3) the questionnaire channeled information gathering along basically disjointed lines of reasoning and not toward the complexity of the highland agrarian systems in which the potato producers were enmeshed. In short, we did not gather through the questionnaire why or how adoption was

occurring. Even cost-benefit analysis of on-farm trials conducted later did not reveal any clear-cut monetary profits to adoption.

The storage team soon came under the accusation from critical colleagues that the adoption by farmers might be a fabrication by over zealous post-harvest technologists and their team social scientist. The answer to many of our questions, however, finally came to Booth and I during our next visit to the mountain trail and after a rather long social occasion of drinking *San Miguel* beer, eating dog meat and befriending mountain farmers. I will never forget a revealing response of one farmer which hit Booth and I like a bolt of lightning.

"You really want to know why we are using the storage method? I will tell you. We always have a problem getting good seed. Seed is the key to profitable production here on the mountain trail. For years we have been dependent for storing our seed in the Chinese controlled cold stores, in Manila, the same people who supply us inputs, especially chicken manure. The cost of taking our seed to Manila each year is high and on numerous occasions, due to power failure and other problems, we have lost whole lots of seeds. Whatever, the cost of moving it back and forth is high. Your method allows us to store seed here on our farms and gives us independence. But this is not something I am going to tell you and have you write down with my name on a piece of paper."

At the moment, a complex system of power relations, credit, inputs, and dependency was suddenly revealed in less than 30 seconds. A formal, predetermined questionnaire format several pages in length would never have reached to the heart of these important and sensitive relationships.

Case 2: The leap frog problem (Mantaro Valley Project, Peru)

This case illustrates the potential quicksand of large-scale surveys, however well constructed the questionnaire. An agro-economic team in this case set out to (1) determine constraints to potato production in a highland valley; (2) address these constraints through testing potential technologies in on-farm trials. A detailed questionnaire was first administered by an agro-economic team to select farmers in three agro-ecological zones previously determined through an anthropological informal survey. The team was trained and systematic data were gathered. The primary problem, however, arose through what I call the "leap-frog syndrome." The project was programmed over a three-year period, involving three growing/harvest periods [2]. This implied that the questionnaire must be executed, results analyzed and conclusions drawn at the end of each season to be able to plan in time for the next round of on-farm trials. In theory, this is possible. However, in a developing country where transportation is problematic, computing ability slow, team coordination a monumental task, and planning difficult, theory and praxis are far apart. Planting times cannot wait for rigid sequential steps involving (1) informal survey to design a (2) questionnaire to plan for (3) on-farm trials, unless each step is executed at breakneck speed. In this case, due to the size and complexity of the survey, there was time to only partially digest findings of the survey to be able to plan for the next on-farm trials. Hence, a leap in faith was required by the team at each step to be able to link premature and unanalyzed survey findings with the technologies to be tested.

This experience illustrates that methods must be modified to become servants to the whole research development process. As I will shortly argue, questionnaires can be valuable for applied rural development if they are (1) seen only as one research tool among many; (2) only as valuable as the results which can be applied practically and in time. In many countries, particularly in Asia, there is a "knee jerk" tendency to use a set standard of questionnaire which is dreamed up or copied from another questionnaire by someone who sits in an office. These questionnaires generally require long interview times (over an hour) and frequently concentrate on Rogerian sociological data - school, religion, position in farmers' organizations, etc. The way the questions are written (often read directly to farmers) is not appropriate for small-scale, subsistence producers who use a different logic for a given practice. Ken McKay (IDRC) in a recent trip report, after seeing a questionnaire to be given to tribal sweet potato farmers on the Philippine Mountain Trail, observed:

"Some questions focus on chemical fertilizers, but subsistence farmers do not use them; they have, instead, elaborate fertilization techniques with organic methods. Yields are difficult to estimate since the questionnaire asks for hectares while farmers use local measurements."

The language of the questionnaire that McKay (personal communication) criticized was phrased in the language of scientists not in the language of farmers and therefore did not lead to correct answers. Enumerators are under special pressure to bring back all blanks filled, especially the numerical data, in and ready for the calculator or computer. In cases like this, interviewers often become impatient after the questionnaire session and secretly fill in the blanks with what they believe the survey coordinator wants to find. The whole exercise finally ends up becoming absurd.

Case 3: Eliciting quantified data without the questionnaire (Potatoes in Nepal)

In 1982, I participated in a review of the Nepal National Potato Programme. The review team decided to find out about farmers' use of potato varieties. The first impulse of the review team was to construct a questionnaire (with all the irrelevant factors and stilted questions). My team was assigned to Nepal's western region. After the first day of using the questionnaire, we felt the questionnaire was not giving us systematic information and was awkward and embarrassing for farmers. Everyone was bored, especially farmers.

After debating the problem, the team decided to abandon the questionnaire and go to the local market and buy all the different potato varieties we could find. Local farmers added more to our sack of different varieties. With our small collection we began to trek northward through the potato areas. At each village or in farmers' fields we could stop and pour out our potatoes on the ground. Farmers quickly gathered around to tell us about our collection. They immediately became enthusiastically involved and through discussions detailed characteristics of each variety, arranging them by different local categories of appreciation: zone production, disease resistance, culinary quality, place in the meal, and so on. Interestingly, after a few interviews with our potato samples, we began to see how quantitative data could be obtained about varieties. We built a matrix on the ground where each variety could be related easily, for example, to multiplication rates in farmer terms, uses, barter and sale, disease problems, marketability, and

zones. Stones and sticks were used to get at comparative values or simply lines were drawn. We found that we could easily and quickly gather (or normally farmers would tell us) very specific information for each variety. Within a very short time, a tremendous amount of very useful quantified data were collected. The quality of these data was much higher than with a questionnaire using categories that were outside a farmer's reality [3].

Case 4: Meeting a specific need (Identifying fallow periods in Bhutan)

Agricultural researchers should not always "throw the baby out with the bathwater." The focused questionnaire, following on the heels of informal methods, can yield important quantified information needed by outsiders on crucial special topics. In Bhutan, after conducting an informal study of potato farming systems in the Bhumtang Valley at the request of the Bhutan government, our team found that Department of Agriculture officials had specific concerns that could only be answered (and believed) by the focused questionnaire. The Bhutanese government, at the highest levels, had become concerned about sustainability and the preservation of traditional agriculture. The specific worry was about fallow periods involving potatoes, a new commercial crop. A few year earlier a potato craze hit many Bhutanese farmers in Bhumtang who were attracted to higher profits from this new cash crop. Farmers had been warned by extension workers about the need for proper crop rotation and about the dangers of disease build up and losing cropping diversity as a result of monocropping potatoes. There was no way to measure whether dangerous cropping patterns were emerging except to gather quantified data on each farm household and their cropping/rotation practices. The logical method to accomplish this was to develop a very specific one-page questionnaire which allowed us to gain the information required within a few days. The one-page questionnaire was supplemented and improved by drawing with farmers on paper or on the ground the fields of farmers and then discussing rotation patterns using the visual images. The results showed that indeed farmers were not rotating their fields properly and were probably headed toward fungal disease build-up and collapse of the new-found potato economy. Based on the results of this focused questionnaire, corrective measures were taken by the Bhutanese government.

Keeping the questionnaire in perspective

The questionnaire survey is but one useful (but often overused and misused) tool for doing research among farmers. In fact, I also suggest that the "empirical, hard-data" questionnaire survey can be considered the easy method; the "informal, soft-data" approach the *hard* one.

I began this paper with reference to a conference in 1980. A decade later (1990), I moved to the Philippines and took up the challenge of establishing and coordinating an Asian-wide (and we ultimately hope world-wide) network on the "User's Perspective With Agricultural Research and Development" (called UPWARD for short). Just to get some projects started, I solicited proposals in several Asian countries and planted a bit of seed money. Within weeks, the questionnaire Albatross came back to haunt me. Virtually every proposal I received contained a 15 page plus questionnaire (the tick-off kind). The more I pushed, however, for participatory methods (informal interviewing, household observation, farmer diagrams, etc.), the more resistance I faced. Finally in frustration, I aggressively cornered one project leader in the capital city and asked:

"Why do you insist on this tick-off questionnaire?"

"Because we have no time," was the reply covered with nervous giggles.

"No time. What do you mean?" I shot back, thinking that my methods were the *epitome* of Rapid Rural Appraisal.

"What you are suggesting, Dr. Rhoades, is hard - informal surveys take time in the field talking to people and it takes even more time to analyze the open ended question. What we want to do is give the questionnaire to our district staff in the field, let them get the data, and then we can deliver it to the computer person back here who will analyze the data for us. And they can not analyze anything but numbers."

So much for hard and soft science [4]! It is easy to set up scientific predetermined check boxes to be filled in and sent to someone in a computer lab who has no feel for the field reality. It's hard to go to the field and figure out the context and relationships that lead farm households to make decisions.

I close my case with the following question I recently found in a 15-page questionnaire at the end of a report from a Himalayan country designed to study women's participation in agricultural extension activities⁶. It illustrates why questionnaires dreamed up in offices have little chance to succeed.

What are the disadvantages of agricultural extension programs? (Please check the following:)

<input type="checkbox"/>	1. Disturbance in the social order.
<input type="checkbox"/>	2. Traditional varieties of crops may disappear.
<input type="checkbox"/>	3. Ecological balance may be disturbed due to use of pesticides, etc.
<input type="checkbox"/>	4. Disturbance in the soil structure.
<input type="checkbox"/>	5. Any other (specify).

The results were used to generate the flowing table (one of 135 tables generated in the study). The most striking feature of the table, however, is that 55% (sample of 48) of the men and 38% (sample 55) of the women felt that the major disadvantage of agricultural extension programmes was disturbance in the soil structure! "Any other" did not make it to the table, but who fills in the "other" line on questionnaires to begin with? Why were the four possible answers chosen over others that would seem more logical, e.g., (1) agents sometimes know less than farmers, (2) extension programmes do not always have relevant technologies (3) agents have no funds (4) work only with wealthy farmers (5) any other? Most of the other 135 tables provide dubiously similar information while the conclusions at the front of the report are quite interesting. This leads me to wonder if the conclusions were made largely independent of the questionnaire itself. If so, this is not the first study that makes a leap in faith and relies on good common sense derived from observation and informal discussions with farmers.

This example also illustrates what Chambers (personal communication) calls "investigator bias" which, once cross-checked, destroys all credibility in the questionnaire. By limiting the responses a farmer can give coupled with the well-known fact that rural people often give prudent and deferential replies, wild distortions from reality end up being reported as scientific fact. He cites a survey by his colleagues at the Administrative Staff College in Hyderabad, India. One of the surveys revealed that only one farmer out of 272 admitted using cross ploughing. The research team, however, walking through fields observed much cross ploughing. Using group interviews with farmers, the team learned that 29 percent said they cross ploughed.

The cafeteria is now open: A diverse selection of methods

Despite the tenacious hanging around of the traditional questionnaire (and much like a bad hangover), a quiet revolution in methods has taken place over the past ten years. Although bits and pieces are starting to come out in various forms including mimeographed notes, newsletter, drafts, etc., and even some already published works [5]. This new serving of methods is still poorly diffused (R. Chambers, personal communication, Sept. S. 1983). These innovative methods (actually old methods) find their origin in anthropology, ecology, and geography and are more intensely practiced today in NGOs and locally run "grassroots" research and development projects than by international agricultural centers, government departments, and universities. Below are listed descriptions and examples of a few underutilized techniques which can be added to other appropriate methods which are now well described (ecological transects, field plotting, key informant interviewing, aerial photographs, etc.) [5, 6].

Table 1. Farmers' opinions about disadvantages of agricultural extension programs in District X

Disadvantage	Percent of Respondents		
	M	F	Overall
Disturbance in the social structure	3	7	5
	(1)	(2)	(3)
Traditional varieties may disappear	3	0	2
	(1)	(0)	(1)
Ecological balance may be disturbed	21	14	17
	(6)	(4)	(10)
Disturbance in the veil structure	55	38	47
	(16)	(11)	(27)

MENTAL MAPS Cognitive models or mental maps are simply fancy anthropological word for how people see and interpret their physical and social environments. Dr. Virginia Sandoval [7] describes a cognitive map as:

"... a geographic representation of the cognitive image pertaining to a certain place or location. In constructing mental maps, people tend to distort proportion and scale. Instead of making faithful

reproductions, they exaggerate those areas which are familiar or important to them and downplay those which are not as important or familiar."

For example, in her research in the Philippines, Dr. Sandoval wanted to know how different socioeconomic statuses and gender groups would interpret (mentally map) biotic components of the environment (e.g., plants and arthropods) and major land use options. In one exercise, her informants were asked (12 males and 12 females) to draw the village area. It was emphasized that accuracy was not important and they were to put down on paper impressions which came to mind. Illiterate informants were assisted with labelling while those unfamiliar with the pencil and paper were assisted by the investigator who followed the movement of their hands (working in sand, etc. may overcome this). Dr. Sandoval found significant differences in how the environment was perceived along the lines of gender and social status.

In another case, regular topographical maps were placed by Peruvian researchers in a community room where the *comuneros* gathered in the evening to take coca and aquareña (local rum)⁷. After finding that the villagers could not readily read the geographical survey maps, the researchers ask the villagers to draw their own village on paper. Within a very short period of time, complex relationships between zones, households and sectorial rotations were revealed.

Clearly, the way different people perceive their environment depends on the degree of knowledge of that environment. Allowing farmers to create their own maps shows subtle but important spatial relationships that cannot be "seen" by "outsiders." Anthropologists have long known this through in-depth ethnographic studies, but they have never made their methods explicit or understandable to rural development workers. For example, ethnographers record the Alaskan Eskimos recognize and deal with a dozen or so states of snow while outsiders recognize only one or two. Equal knowledge of soil types, parcels, watersheds, etc. are perceived by mountain farmers (and other kinds of "marginal land" farmers). Even in developed countries like the USA, a person from the city will see big pigs and little pigs and many may recognize sex differences (male and female). However to the American farmer, the classifications are subtle: boar, sow, gilt, shoal, boar pig, weaning pig, runt, not to mention the many breed names which farmers keenly distinguish. In Bhutan, I recently tried to understand from farmers the many names of bovines along a continuum from pure yak to pure cattle. I gave up somewhere about one-fourth along the continuum.

MINIATURE CONSTRUCTIONS OF VILLAGE LANDSCAPES (Spanish: *La Maqueta*)

One of the more exciting activities the Peruvian Pisac group engaged in during the early 1980s was the construction using mud and straw of the village topography. Most high Andean communities are characterized by extremely complex ecologies and farming systems that a one dimensional map fails to reveal, e.g., land use and social relationships. The team, with the *comuneros*, decided to construct a three dimensional model which symbolizes field layouts, irrigation channels, pastures, and the rotation sectors (called *turnos* or "turns"). In exercises like these, the time and spatial dynamics and folk categories of village agriculture and land use can be understood. Generally, there are seven turns in a village which the villagers can easily detect, but to outsiders the layout was a mystery until explained using the *maqueta*. The models bring out what is significant to villagers and can stimulate endless hours of discussion of land use, tenure, rotations, disputes, animal ownership, gender assignments, cropping patterns etc.

WORKING FOR FARMERS IN EXCHANGE FOR INFORMATION This was a technique pioneered by John Hatch [8] in his research among corn farmers on the Peruvian coast. The investigator team simply approaches a farmer and asks to exchange labour for learning about a crop or agricultural task. I have found most farmers get a big kick out of this. While the researcher may become the butt end of many jokes, the experience is enriching and engaging for both researcher and farmer. I have found that a full day of harvesting potatoes in the field is physically demanding but extremely rewarding in two ways: a tremendous amount of information can be gleaned and an "insider's" knowledge of the nature of field work can be acquired. This "empathy" is extremely important, since most agricultural scientists today have never done a single day of agricultural labour. Endless variants of this approach are possible. Greg Scott of CIP, who studied potato traders in Peru, claims some of his most valuable information on marketing was obtained by riding potato trucks down the mountain to the central market in the capital city. He helped load the potatoes in the field and experienced the marketing chain right up to the final haggling in the wholesale market of Lima. Variations might include (1) cleaning an irrigation ditch (2) making a mud floor (3) sorting seed (4) herding cattle. Systematically recording the experience in notebooks and analyzing data later is absolutely necessary.

RESEARCHER AS CULTIVATOR OR HERDER A variant of working with farmers is to do it yourself as a farm operator. This is an old technique but has rarely been practiced in recent years by researchers. The method is to acquire a small piece of land and farm yourself. Don Winkleman, now Director of CIMMYT, said in his earliest years in Mexico, as the first economist at CIMMYT, he helped establish his rapport with biological scientists and farmers by actually putting in a crop of corn himself. CIP social scientists in Asia are now learning about indigenous sweet potato cultivation by limiting their inputs and trying to grow their own sweet potato under the supervision of farmers. There is no experience like trying to do it yourself to learn about how farmers make decisions and the problems they face.

USE OF PHOTOGRAPHS In his study of the village of Maracapata in the eastern escarpment of the Peruvian Andes, Dr. Norio Yamamoto of the Osaka Museum of Anthropology had a hard time following farmers' discussions of agricultural calendars and land use on the slopes. As an excellent photographer, Yamamoto took a series of wide angle photos of segments of the village lands and then pasted them together so the complete over view could be obtained. This panoramic photo was then used for discussions with farmers. In another variation, one can show photos of agricultural activities to different groups (male, female, children, elders) and elicit information on their variable perceptions.

EAGLE-EYE PLOTTING AND OBSERVATION A complementary activity, particularly in mountainous areas, is to find a high place above the village lands and plot the fields or watch daily movements of herds and people. Later this can be used with the residents to fill in pertinent information about land use and cropping practices. Quantification of hours of labour, herd sizes, sex and age ratios of humans and herd animals in the fields can be made.

SACK OF SEEDS TECHNIQUE Earlier in this paper, I explained a simple but extremely interesting technique to get at a whole range of topics from family nutrition to marketing practices. Just go to a market place and buy all of the different varieties of the crop or crops that

a researcher may be interested in. The seed samples are then taken to a village, or while hiking through a farming area, the seeds are poured out of the sack for farmers to examine and rank. Investigators will be surprised how much information, even quantifiable information, can be obtained in this interactive way. Variations on this technique are to assemble a collection of insect pests pinned in a box or even test tubes or jars with different soil types collected in the study area.

FARMER-DESIGNED EXPERIMENTS Increasingly, agronomists and social scientists at CIP are now letting farmers take over experimentation of the institute's technology from the earliest stages. This includes revolutionary technologies like true botanical seed (TPS) to cut-and-dried tasks such as germplasm evaluation. There is strong evidence that the most successful plant breeders have always used this method; that is, encouraging selection by farmers of successful clones [9]. Another example involves a CIP team working with Indonesian scientists which decided to simply give true potato seed to farmers along with basic concepts and principles and then watch what farmers do. The farmers shortly created many experiments to test alternatives of the potato seed production (direct seeding, transplants, use of tuberlets) (M.J. Potts et al., personal communication, 1987). Farmer advisory boards to design experiments are a variant of this technique.

FARMER FIELD DIAGRAMS This is a farmer-scientist interactive technique that has been described by several authors [10]. This technique is based on the premise that farmers have special conceptual skills that scientists do not have in diagramming important spatial relationships and agricultural flows. These skills do not necessarily involve scientists' tools of pencils and paper but are executed with the tools and materials readily available in a field or a household compound (sticks to draw in sand, pebbles, seed, cut stalks, etc.) For example, farmers of the Eastern Andes are keenly aware of different ecological floors reaching from the high Andes to the jungle floor covering an additional span from over 4000 metres to 180 metres above sea level. Given a piece of loose soil, they can diagram the different ecological levels, types of crops grown, and give the Quechua names of each level. This sets the stage for hours of interesting discussions about a wide range of topics from politics to plant responses at each ecological level.

TAPPING KNOWLEDGE OF SCHOOL CHILDREN This is a technique used by the CIP post-harvest team on a number of occasions. Research on in-house storage is one of the most difficult tasks for post-harvest researchers due to (1) privacy in the house (seeds are wealth); (2) special gender control (men cannot enter); and (3) suspicion that investigator is a tax assessor. To get around these problems in a Central American country, the team visited a local school, explained the research to the headmaster who in turn sent the children (ages 10-14) home with the homework exercise to draw the kind of storage inside the house. As a team, we explained our purpose to school authorities (and that the information would be guarded). The teacher agreed to make the exercise voluntary and with parental permission. We were amazed at how much information the 30 children brought back on in-house storage of potatoes (design of store, location in house, amount of light and darkness, and physiological conditions of the tubers). In addition, the children were able to elicit information about beliefs and taboos surrounding stored products (e.g., evil-eye).

ELICITING FOLK WEIGHT AND MEASURES The differences between scientists' (metric system) and folk weights and measures have long been a great source of frustration for rural development workers, particularly when using the questionnaire. A simple exercise is to gather items of local units (e.g., basket of potatoes) as defined by the farmers and actually measure to convert to the metric system. In other cases, the conversion is not so simple. For example, farmers in most marginal areas rarely use tons per hectares as a way to measure productivity (they cannot measure tons without scales and they do not know what a hectare unit of land is). Instead, they frequently use multiplication rates (e.g., one sack of seed potatoes yields six sacks of potatoes). The simple way to acquire this information is through a seed multiplication game on a simple board or in the sand where you define the zones (e.g., irrigated and upland). A single tuber potato may represent a sack of a given variety and the question to the farmer is how many tubers can be produced from this one.

CASHING IN ON MENTAL BANKS This is a new concept being developed by Dr. Virginia Sandoval of CIP (Philippines). The idea is that "germplasm" banks (such as IRRI for rice, CIP for potatoes or ICISAT for sorghum) have an analog in "mental" banks possessed by farmers who have long cultivated, nurtured, and utilized those varieties. The importance of "mental" banks is underscored in two ways: (1) many germplasm gene banks contain materials that can be found only in the "mental" banks of people over 70 years of age (in the case of rice in the Philippines). Samples of the vanished varieties taken from gene banks' materials can be discussed with the people who once used them. After the older generation passes, all existing knowledge about varieties will be lost; (2) knowledge in the form "mental" banks can be linked with ongoing agricultural research (such as classification and evaluation of recently collected germplasm). The specific techniques for drawing on mental banks will vary from informal interviewing or discussions while examining objects of concern (e.g., seed). Mental banks can be also approached through a simple opening question "What varieties of rice (or potato, sorghum, etc.) did your father and mother grow when you were a child? [11]. When you were a young person of 15? And when did you first start farming on your own land?" Exploring mental banks at different time periods can give a long-term dynamic view of specific germplasm problems.

OLD FASHIONED ETHNOGRAPHY Another out-of-vogue method (along with the questionnaire) is traditional ethnography which has been described as "10 years of research and 10 years write-up." However, a great deal of anthropological research has always been rapid (although the ideal for the student was once to reside in a village for a year or more). Even Robert Chambers who formerly criticized traditional ethnography is now talking about "camping" in the village, one step back toward "living" in the village. In fact, there is no real substitute to spending time with people. Only then can you truly penetrate the "deep structures" of their lives and livelihoods.

The 13 "new" methods listed above do not exhaust the new menu but are merely illustrative. In using these and other innovative methods, the following cautionary notes should help the user keep the new methodology in perspective:

1. These methods are always informal, creative, flexible and interactive. They are to be embellished as the researcher and researched see fit. As a result, no cook book on "how to do it" step by step should be published, although guidelines and examples are urgently needed.

2. There is no better training than experience. Hands on training courses are needed. The only way to learn the new methodology is to use it.
- 3 The new methodology may not always be quick and cheap. Some of these procedures take time.
4. The methods can be used in clusters and each should flow easily into the other. There is no rigid sequencing of methods but the context and natural flow will lead the investigator to vary the order of techniques.
5. The implementor of the new methodology must be careful not to reduce the interaction with farmers to a kind of insulting silliness. The cultural context must be understood as to what is permissible and honorable. If an investigator uses any of these participatory techniques because he thinks farmers have a lower level of ability for conceptualization and therefore must be treated like children, then the investigator has obviously missed the point.
6. Those bold enough to use the new methods can expect to be ridiculed by normal scientists. Already jokes are circulating in formal science circles about those who play funny little shell games with farmers and believe in finger scales that farmers use to measure animals and children.
7. While these techniques are meant for action research, however, it is my contention that they are also valuable in and of themselves for any serious researcher (pure or applied) who wishes to understand Third World farmers. Quantified data as well as descriptive, anecdotal data can be gathered by these methods. If necessary, scientific-looking charts, pie charts and tables can be generated from these informal methods if "numbers" proves to be the most influential form of communication for convincing agricultural scientists or policymakers.

Conclusions

In this paper, I have been strongly critical of quantitative field methods used in rural and agricultural development research. I believe my criticisms are well taken, but it is equally true that those academic fields - particularly anthropology and geography - which have pioneered the methods described in this paper have not made any attempt to diffuse them for wider use beyond their narrow academic interests. Of equal interest for rural development workers would be the social theory (symbolic interactionism, grounded theory, decision-making trees, etc.) which underlies the new methodology. Volumes such as *Applied Qualitative Research* [12] should be distilled and reworked to apply more directly to agricultural and rural development projects. The point is that there is a great deal of value in the academic literature which is not being utilized in the field.

Finally, the revolution in methods will only succeed if a simultaneous revolution in thinking about farming and rural life takes place among development researchers [13]. Not only will rural

development researchers have to become "insiders" as much as possible (and these techniques encourage the inside view), but agriculture itself should be understood as "performance" in the parlance of Paul Richards [14]. Third world farming has almost never been a predetermined plan concocted by cultivators who select this technology or that technology off the shelf to meet a "constraint." Instead, farming may indeed be perceived by farmers as having an imagined "ideal" but due to totally unpredicted events that occur along the way (selling the cow to bury grandmother), the act of farming becomes a fluid, amorphous drama with no end point. Farmers, of course, will tell us that their performance can and should be improved. Methods that involve rural development workers' analysis of that ongoing drama are destined to bring insights (and technological solutions) never dreamed up by normal science. Farmers already know this. Their eyes, their laughter, their hand gestures, and a beautiful enthusiasm only found among rural peoples are clues as to whether we are coming closer to understanding the performance. Convincing established, normal science that the revolution is upon us will be a much more difficult and serious undertaking.

Endnotes

1 Workshop on "Methodological issues facing social scientists in applied crop and farming systems research." CIMMYT; Mexico (April 1-3, 1980).

2 The participant list, if I remember correctly, read something like today's Who's; Who of international agricultural economists: Don Winkleman, Peter Hildebrand, David Norma, Jock Anderson, Mike Collinson, Derek Byerlee, John Flinn, Larry Harrington, Doug Horton to mention only a few.

3 In fact, the Art of the Informal Survey was rejected by several journals, including Human Organization (which later accepted a stilted academic re-write) and Agricultural Administration. Reason: Not "Scientific." Meanwhile, as Robert Chambers later informed me, the paper was being photocopied on hundreds of worn out, wired together copy machines in dusty agricultural extension and research offices throughout his beat. Practitioners in the field were hungry for such relevant methods.

4 I am not including in this category survey of market prices.

5 In 1967, I was an exchange sociology student at the University of the Philippines, Los Baños. The only respectable kind of survey at that time was the elaborate Everet Rogers styled questionnaire.

6 I prefer not to cite the reference from which this question is taken.

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